Southampton Outfall Inventory and Dry Weather Screening Field Effort Summary – Spring 2020

TO: Randall Kemp, Highway Superintendent

FROM: Tracy Adamski, AICP; Emily Tully

COPY: Town of Southampton Stormwater Management Plan Files

DATE: June 30, 2020

Background

The U.S. Environmental Protection Agency (EPA) nationally regulates the discharge of stormwater runoff that is transported into local water bodies through Municipal Separate Storm Sewer Systems (MS4) that are located in Urbanized Areas (also known as "regulated areas"). The Town of Southampton meets EPA's regulatory threshold, and therefore is required to be covered under a National Pollutant Discharge Elimination System (NPDES) permit for its stormwater discharges from the MS4 in its Urbanized Area.

The portion of Southampton considered to be urbanized area regulated under the MS4 program includes small areas adjacent to the Cities of Easthampton, Holyoke, and Westfield, with the remainder of Town not part of the regulated area. The regulated areas are the northeast corner of Town near Pomeroy Meadow Road, Glendale Road, and Sawmill Brook extending west from Easthampton; County Road near Plain Street along the boundary with Easthampton; a small area extending northeast/southwest up from Westfield along Brickyard Road near Swanson Corner; and the southeast corner of Town near Pequot Pond next to Westfield and Holyoke.

In Massachusetts, the EPA Region 1 and the Massachusetts Department of Environmental Protection (MassDEP) jointly administer the municipal stormwater program. EPA and MassDEP originally authorized Southampton to discharge stormwater in 2003 under a *NPDES General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems*, known as the "2003 Small MS4 General Permit." The 2003 Small MS4 General Permit expired in May 2008, but remained in full force and effect until the 2016 replacement permit became effective on July 1, 2018. The Town of Southampton submitted a Notice of Intent (NOI) to EPA and MassDEP on September 28, 2018 for coverage under the reissued NPDES *General Permit for Stormwater Discharges from Small MS4 in Massachusetts* (known as the "2016 Small MS4 General Permit")[1] and the Town's Authorization to Discharge was issued by EPA and MassDEP on April 5, 2019.[2]

The Town of Southampton has developed a Stormwater Management Program (SWMP) to be consistent with the requirements of the 2016 Small MS4 General Permit.[3]

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[1] Town of Southampton, MA Notice of Intent for Coverage under Small MS4 General Permit (2018): https://www3.epa.gov/region1/npdes/stormwater/ma/tms4noi/southampton.pdf

[2] NPDES Permit ID # MAR041021, Town of Southampton, Authorization to Discharge Stormwater: https://www3.epa.gov/region1/npdes/stormwater/ma/tms4noi/southampton-auth.pdf

[3] Town of Southampton SWMP: http://www.townofsouthampton.org/Highway/Town%20of%20Southampton%20Stormwater%20Management%20Plan.pdf

The SWMP contains six elements called minimum control measures (MCMs) that, when implemented, should result in a significant reduction in pollutants discharged into receiving waters:

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination (IDDE)
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management
6. Good Housekeeping and Pollution Prevention

Dry Weather Flow: This term refers to when there is flow present at an outfall/ interconnection and there has been less than 0.10 inches of rainfall in the previous 24 hours and no significant snow melt is occurring.

Under the MCM 3 Illicit Discharge Detection and Elimination (IDDE) Program, *Section 2.3.4.7.b of the 2016 Small MS4 General Permit, Dry Weather Outfall and Interconnection Screening and Sampling*, "**all outfalls/interconnections … shall be inspected for the presence of dry weather flow within three (3) years of the permit effective date**."

As part of the IDDE Program required by *Section 2.3.4.6* of the 2016 Small MS4 General Permit, Tighe & Bond developed a Southampton-specific *Dry Weather Sampling Procedure* for outfall investigations and sampling efforts. This sampling procedure describes the steps to follow to complete outfall investigations and dry weather flow sampling, including which constituents to sample for in each receiving waterbody's watershed. Southampton's *Dry Weather Sampling Procedure* is available in Appendix F of the IDDE Plan, which is located within Appendix J of the SWMP.

This memorandum presents a summary of Tighe & Bond's outfall inventory and dry weather screening investigations that were completed in the Spring of 2020 and findings for 100% of Southampton's known MS4 regulated outfalls. During the Spring 2020 field effort, Tighe & Bond and Southampton staff completed 12 outfall investigations and sampled at 5 outfalls or upstream drainage structures with dry weather flow. One outfall was removed from the inventory as it was determined to be a privately owned structure. **None of the outfalls investigated met EPA's criteria for a likely sewer input.**

1.1 Preparation for Field Work

In accordance with General Permit *Section 2.3.4.6* requirements, Tighe & Bond developed a Southampton-specific *Dry Weather Sampling Procedure* for outfall investigations and sampling efforts undertaken during this contract. This sampling procedure describes the steps to follow to prepare for and complete outfall investigations and dry weather flow sampling, including which constituents to sample for in each receiving waterbody's watershed. Southampton's *Dry Weather Sampling Procedure* is available in Appendix F of the IDDE Plan.

As part of developing the outfall and interconnection inventory for the IDDE Plan (located in Appendix D of the IDDE Plan), each outfall in the inventory was provided an initial ranking by Tighe & Bond prior to field work.

Field test kits were used for chlorine and ammonia analysis. Laboratory analysis was completed for surfactants, ammonia, total nitrogen, and all water quality impairment samples (see Section **Error! Reference source not found.** for more information about Southampton's impaired waters).

1.2 Field Data Collection Tablet Application

Prior to the Spring 2020 outfall investigations, Tighe & Bond developed a digital field form in Survey123 for ArcGIS Online, which was used to record outfall attribute information using a tablet during the field work. It was also used to note whether dry weather flow was present at each outfall and, if it was, the results of the sampling effort. An example of the Survey123 tablet form is shown in Figure 1.

Paper field sheets, which the tablet form is based on, were developed to be used in case of tablet error. An example of this field sheet is available in Appendix F of the IDDE Plan and may be used for future outfall investigations and field efforts.

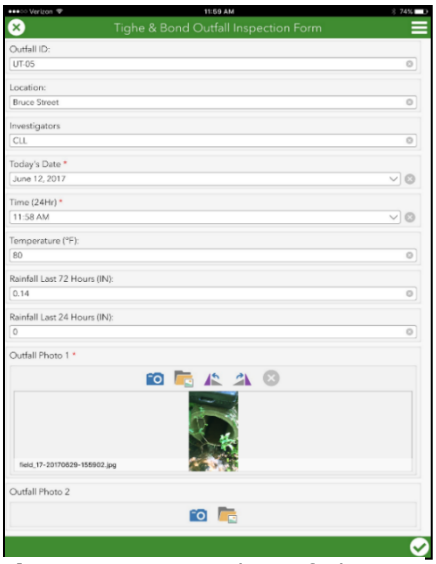


Figure 1: Screenshot of the Dry Weather Outfall Inspection Form

1.3 Surface Water Quality Standards

Per *Section 2.3.4.7.b.iii.4.a)* of the 2016 Massachusetts Small MS4 General, ammonia, chlorine, conductivity, salinity, *Escherichia coli* (*E. coli*), surfactants, and temperature must be measured at every outfall where dry weather flow is found.

The Town must also measure pollutants of concern for outfalls discharging directly to an impaired waterbody, including impaired waterbodies with and without approved Total Maximum Daily Loads (TMDLs). Table 1 lists impaired waterbodies in Southampton and the pollutants of concern associated with each, based on the *Massachusetts Year 2016 Integrated List of Waters*[4] and Appendix F of the 2016 Small MS4 Permit, *Requirements for Discharges to Impaired Waters with an Approved TMDL*.[5] Constituents that are in *blue italics* were analyzed in-situ or as part of the 2016 Small MS4 General Permit sampling requirements. Constituents in *black italics* required additional laboratory analysis, and impairments not in italics did not require analysis under the 2016 Massachusetts Small MS4 General Permit *Appendix G: Impaired Waters Monitoring Parameters Requirements.*

Table 1. Impaired Waterbodies in Southampton, MA

Waterbody Name	Segment ID	Pollutants of Concern for Impairment
Manhan River	MA34-11	*Escherichia coli (E. coli)*
Pequot Pond	MA32055	*Phosphorus (total)* *Dissolved oxygen* Eurasian Water Milfoil Non-native aquatic plants Chlorophyll-a *Enterococcus*
Long Island Sound	All	*Nitrogen (Total)*

[4] Massachusetts Year 2016 Integrated List of Waters: https://www.mass.gov/doc/final-massachusetts-year-2016-integrated-list-of-waters/download

[5] Appendix F of the 2016 Small MS4 General Permit, Requirements for Discharges to Impaired Waters with an Approved TMDL: https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/appendix-f-2016-ma-sms4-gp.pdf

Southampton's MS4 is located within the Connecticut River watershed, which is part of the drainage basin of the Long Island Sound. The Long Island Sound has an approved TMDL for nitrogen, which establishes both in-basin nitrogen reductions and out-of-basin (north of Connecticut) nitrogen reductions necessary to achieve water quality standards for Dissolved Oxygen in Long Island Sound. Per *Section 2.2.1(c)(i)(1)* of the 2016 Massachusetts Small MS4 General Permit, the Town of Southampton must comply with the requirements of Appendix F part B.I with respect to nitrogen discharges.

Per *Section 2.3.4.7.a.ii* of the 2016 Massachusetts Small MS4 General Permit, likely sewer input indicators include any of the following:

- Olfactory or visual evidence of sewage;
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water; or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

No Town-owned sewer exists in Southampton; however, sewer indicators can also identify connections from utility sinks, septic systems, and other potential illicit connections.

1.4 Spring 2020 Field Work Background

Tighe & Bond along with Southampton Highway Department Staff completed outfall investigations on April 23, 2020, including gathering outfall inventory data and sampling at outfalls if dry weather flow was present. The *Dry Weather Sampling Procedure* was followed for each outfall investigation and may be used for future outfall investigations.

Inventory/Inventoried: This term refers to the General Permit requirement in *Section 2.3.4.7.a* to visually inspect each outfall during dry weather conditions and collect prescribed data such as location, size, and visual and olfactory evidence of an illicit discharge.

Tighe & Bond visited 12 outfalls, which accounts for all of Southampton's outfalls within the MS4 area. See Section 2 of this memorandum for results from the field effort.

Tighe & Bond has delivered updated GIS data to the Town with the results of the outfall investigation and dry weather sampling, including photographs of the outfalls investigated, additional outfall attributes, and water quality screening and laboratory results.

The map in Attachment 1 shows the locations of all mapped outfalls in Southampton. Each outfall is denoted as to whether the outfall inventory and dry weather screening were attempted under the Spring 2020 field effort. The map in Attachment 2 provides a summary of the screening status (i.e., investigation complete, could not locate, etc.) of each of the outfalls visited during the Spring 2020 sampling effort.

Attachment 3 contains an updated outfall inventory for Southampton in Excel, including sampling requirements, investigation dates, and notes for each outfall investigated during the Spring 2020 field effort. All municipal outfalls within the urbanized area were visited as noted herein. Tighe & Bond or the Town will continuously update this table during subsequent outfall investigations or if other MS4 outfalls are identified.

Dry Weather Investigation Results

Section 2 of this memorandum presents the results of the outfall investigations and dry weather flow sampling. The following is a summary of the Spring 2020 field work results:

- 13 outfalls were attempted to be investigated during this field effort. These outfalls are denoted with purple triangles in Attachment 1. Of the 13 outfalls that were attempted to be investigated:
    - 12 were successfully screened for dry weather flow. These outfalls are denoted with green triangles in Attachment 2.
        - 5 of these outfalls had dry weather flow and were sampled. If the outfall was submerged, samples were taken from the upstream catch basin or drain manhole. These outfalls are denoted with purple circles in Attachment 2.
        - 1 of the outfalls (9_OF) was initially visited but not fully investigated as it was buried under debris and soil. The Highway Department followed up on June 11, 2020, and uncovered the outfall, which was under approximately two feet of sediment. While the pipe was covered, the sediment did not extend into nor block the pipe. Tighe & Bond visited the uncovered outfall on June 23, 2020 under dry weather conditions; no flow was observed.
- 1 outfall (13_OF) was not visited, as it is within a private subdivision and is not maintained by the Town of Southampton. Therefore it is not part of the Town's MS4 or subject to the IDDE outfall investigation program and was removed from the Town's outfall inventory.
- **Total: 12 mapped MS4 outfalls in Southampton's Urbanized Area**

2.1 Dry Weather Flow Sampling Results

Per 2016 Massachusetts Small MS4 General Permit requirements, ammonia, chlorine, conductivity, salinity, E. coli, surfactants, temperature, and pollutants of concern must be measured at every outfall where dry weather flow is found. Specific information about the pollutants of concern is included in the *Dry Weather Sampling Procedure* in the IDDE Plan.

Per *Section 2.3.4.7.a.ii* of the 2016 Massachusetts Small MS4 General Permit, likely sewer input indicators include any of the following:

- Olfactory or visual evidence of sewage;
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water; or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

Class B waters, per *314 CMR 4.05*, are designated as a habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. The E. coli water quality criteria for Class B waters are as follows:

- During the bathing season,
    - A single sample shall not exceed 235 colonies per 100 mL; and
    - The geometric mean of the five (5) most recent samples shall not exceed 126 colonies per 100 mL.
- During the non-bathing season,

- A single sample shall not exceed 235 colonies per 100 mL; and
- The geometric mean of all samples taken within the most recent six (6) months shall not exceed 126 colonies per 100 mL (typically based on a minimum of five [5] samples).

Per *Section 2.3.4.7.a* of the 2016 Massachusetts Small MS4 General Permit, all outfalls within the MS4 must be ranked as high priority or low priority outfalls. Outfalls should be considered high priority if there is dry weather flow with pollutant concentrations as described above or visual observations that meet the criteria for a likely sewer input. The permit also requires that discharges that may cause or contribute to an in-stream exceedance of surface water quality standards should be considered a high priority for catchment investigation.

Tighe & Bond sampled at 5 outfalls with dry weather flow during the dry weather outfall screening and sampling field effort as described in Table 2 below.

Table 2. Outfalls Where Dry Weather Sampling was Conducted (Spring 2020)

Outfall ID	Sampling Location	Street
2_OF	Outfall	Pomeroy Meadow Road
5_OF	Outfall	Duggan Lane
6_OF	Outfall	Meadow Lane
7_OF	Upstream Catch Basin	Brickyard Road
8_OF	Outfall	Brickyard Road

Sampling results are included in the Outfall Sampling Summary in Attachment 4. Complete laboratory analysis reports from Alpha Analytical were provided under separate cover. The Outfall Sampling Summary has a color-coded ranking system for the results of the outfall monitoring, which demonstrates the severity of the sampling results (i.e., a red result denotes a higher, potentially problematic concentration of a stormwater pollutant). The ranking system uses known EPA benchmarks and other water quality benchmarks from Federal and State resources for each pollutant analyzed. This system was used to clearly understand the water quality at each outfall and will be used to determine the follow-up outfall prioritization required by *Section 2.3.4.7.c* of the 2016 Massachusetts Small MS4 General Permit. A priority ranking of "low" or "high" will be given to each outfall depending on sampling results and its potential for the presence of an illicit discharge at the conclusion of the three (3) years of outfall investigation field work.

Characteristics of Likely Sewer Input: No location sampled during the dry weather outfall screening and sampling field effort met EPA's criteria for a likely sewer input:

- A number of outfalls had various minor exceedances in benchmark levels. In order to be considered a potential source of illicit discharge, it would be expected that flow from a single outfall would surpass multiple benchmarks, as described above. A single benchmark exceedance is not alone indicative of an illicit discharge.
- Four of the sampled outfalls, 2_OF, 6_OF, 7_OF and 8_OF had chlorine levels at or greater than the EPA benchmark of 0.02 mg/L, which may indicate potable water source inputs. However, none of these outfalls met the criteria for likely sewer input as levels of ammonia, surfactants, and E. coli were non-detect or below the benchmark level for each of these outfalls. Sources of the chlorine may include water main leaks or breaks, hydrant flushing, or chlorinated pool water discharges to the storm drain. It is unlikely that there is a sewer input to these outfalls.

- At outfalls 2_OF, 5_OF, 6_OF, and 7_OF total nitrogen levels exceeded the benchmark value; however, the levels of surfactants, ammonia (from the laboratory analysis), and *E. coli* were below benchmark levels. It is not likely that there is a sewer input to these outfalls, but **these outfalls should be ranked as High Priority** in the Priority Ranking of Outfalls and Interconnections at the conclusion of the outfall investigation field work because they may cause or contribute to a waterbody exceedance of the surface water quality standard for total nitrogen.

2.2 Submerged Outfalls

The outfalls included in Table 3 below were at least partially submerged due to high water levels downstream or substantial sediment buildup at the outfall. Per *Section 2.3.4.7.b.2.iii* of the General Permit, if an outfall is inaccessible or submerged, the investigator shall proceed to the first accessible upstream drain manhole or catch basin for the observation and sampling effort and report the location with the screening results.

Tighe & Bond was able to complete dry weather monitoring at the partially submerged outfall or in upstream structures for both of the submerged outfalls during this field effort. These outfalls are shown as "Investigation Complete" in Attachment 2 and additional notes are provided in Attachment 3. No outfalls were fully submerged at the time of investigation.

Table 3. Submerged Outfalls (Spring 2020)

Outfall ID	Street	Notes
4_OF	Miller Avenue	Partially submerged, checked upstream catch basin, no flow
7_OF	Brickyard Road	Partially submerged, screening completed

2.3 Outfalls Requiring Maintenance

Some of the outfalls visited during Tighe & Bond's field efforts were partially or completely full of sediment, leaves, or debris. Tighe & Bond recommends that the outfall pipes and discharge areas of all outfalls are maintained on a regular basis for proper function of the drainage system. The outfalls included in Table 4 below were noted to have maintenance issues during the Tighe & Bond field effort and should be evaluated by Town staff and cleaned and/or repaired as soon as possible.

Table 4. Outfalls Requiring Maintenance (Spring 2020)

Outfall ID	Street	Reason
1_OF	Camp Jahn Road	Metal pipe is corroded.
4_OF	Miller Road	Partially filled by sediment.
7_OF	Brickyard Road	Partially filled by sediment.
8_OF	Brickyard Road	Metal pipe is corroded
10_OF	Freyer Road	Partially filled by sediment, metal pipe is corroded.
11_OF	Beccari Lane	Metal pipe is corroded.

2.4 Outfalls to Reclassify

Outfalls owned and operated by private or state entities should be removed from the Town's MS4 outfall inventory. Private outfalls and outfalls regulated under a separate NPDES permit are not regulated under the Town's MS4 permit and do not need to be included in the IDDE program. During the Spring 2020 field effort, one outfall, 13_OF, was identified under this

category as a privately owned and operated structure within a private subdivision and was subsequently removed from the Town's outfall inventory.

Conclusions and Recommendations

This outfall investigation and dry weather monitoring effort was completed as part of the Town's IDDE Program and begins to satisfy the requirements of 2016 Massachusetts Small MS4 General Permit *Section 2.3.4.7 Outfall/Interconnection Inventory and Initial Ranking and Dry Weather Outfall and Interconnection Screening and Sampling* for outfalls. This memorandum will be appended to the Town's Stormwater Management Plan (SWMP).

As of the date of this memorandum, Tighe & Bond has successfully completed outfall investigation and dry weather screening at all 12 of Southampton's outfalls. **No outfalls and upstream structures investigated during this field effort have evidence of a direct or indirect sanitary wastewater connection.**

Specific recommendations based on field observations have been listed throughout this report. Additionally, it is recommended that the Town **continue to complete drainage system operation and maintenance (O&M).** The Town should continue to clean outfalls and drainage systems in order to keep the system functional. This includes removing sediment from outfalls as it accumulates and repairing outfalls when they degrade.

Attachments

Attachment 1: Spring 2020 Outfall Inventory and Sampling Map – Investigation Status

Attachment 2: Spring 2020 Outfall Inventory and Sampling Map – Screening Status

Attachment 3: 2020 Outfall Inventory Summary (Excel)

Attachment 4: Outfall Sampling Results Summary

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WESTHAMPTON

NORTHAMPTON

EASTHAMPTON

MONTGOMERY

HOLYOKE

WESTFIELD

WEST SPRINGFIELD



Legend

- Town Boundary
- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road
- Public Surface Water Supply
- Lake, Pond, River or Impoundment
- Inland Wetlands
- Stream/Intermittent Stream

Investigation Status

- DidNotVisit
- InvestigationAttempted
- Private

N

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ATTACHMENT 1
SPRING 2020 OUTFALL INVENTORY AND SAMPLING - INVESTIGATION STATUS

Illicit Discharge Detection and Elimination Plan
Southampton, Massachusetts

June 2020

Tighe&Bond

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NORTHAMPTON

WESTHAMPTON

EASTHAMPTON

MONTGOMERY

HOLYOKE

WESTFIELD

WEST SPRINGFIELD



Legend

- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road
- Town Boundary
- Public Surface Water Supply
- Lake, Pond, River or Impoundment
- Inland Wetlands
- Stream/Intermittent Stream
- Sampled Outfall
- Investigation Attempted - Could Not Access
- Investigation Complete

N

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Feet

ATTACHMENT 2
SPRING 2020 OUTFALL INVENTORY AND SAMPLING - SCREENING STATUS

Illicit Discharge Detection and Elimination Plan
Southampton, Massachusetts

June 2020

Tighe&Bond

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OBJECTID	L0gpsOutfalls_ID	L0surveyPoint_outfall_id	L0gpsOutfalls_STRID	L0gpsOutfalls_TYPE_	L0gpsOutfalls_DIA	L0gpsOutfalls_MATERIAL	L0gpsOutfalls_CONDITION	L0gpsOutfalls_EROSION	L0gpsOutfalls_NOTES	L0gpsOutfalls_InvestigationS_10
26	0	1_OF	outfall		30	Metal	Good	Lttl	Runs off road behind houses to a detention basin	InvestigationAttempted
66	2	2_OF	outfall	Discharge direct to manhan	30	Concrete	Good	Low	Direct to manhan takes all water from Pomeroy meadow st	InvestigationAttempted
68	4	3_OF	outfall	Direct discharge to stream	12	Plastic	Good	No	Direct discharge to saw mill brook	InvestigationAttempted
69	5	4_OF	outfall	Direct to drainage swale	12	Corrugated metal	Good	No	Direct discharge to drainage swale. Has appearance of small stream	InvestigationAttempted
75	12	5_OF	outfall	Dougan discharge	12	Corrugated metal	Good	Lttl	Drain line from Dougan. Discharge into small stream or drain channel	InvestigationAttempted
76	12	6_OF	outfall	Drain meadow lane	24	Plastic	Good	No	Drainage into channels in conservation area	InvestigationAttempted
78	15	7_OF	outfall	Discharge channel	12	Metal	Good	Some	Drainage channel from road discharge	InvestigationAttempted
79	16	8_OF	outfall	Road discharge	18	Corrugated metal	Some damage at bottom	Some	Road drainage	InvestigationAttempted
85		9_OF	outfall	Buried outfall from CB	0				Buried outfall could not observe. Location clear from nearby Catchbasin and drainage swale	InvestigationAttempted
86		10_OF	outfall	Culvert	18	Metal	Rot/ damage	Some	Catchbasin to drainage channel on side of road	InvestigationAttempted
87	0	11_OF	outfall	Direct discharge to pond	24		Corrugated metal	Lttl	Line from CB on road to Pond	InvestigationAttempted
88		12_OF	outfall	Outfall culvert		Concrete	Good	None	Catchbasins connect to brook culvert below rd. Picture taken of brook culvert	InvestigationAttempted

L0surveyPoint_outfall_id	L0gpsOutfalls_ScreeningStatu_11	L0gpsOutfalls_New_OutfallID	L0gpsOutfalls_Note	L0surveyPoint_ObjectId	L0surveyPoint_globalid	L0surveyPoint_CreationDate	L0surveyPoint_Creator	L0surveyPoint_EditDate	L0surveyPoint_Editor	L0surveyPoint_location	L0surveyPoint_investigators	L0surveyPoint_todays_date
1_OF	InvestigationComplete	1_OF		10	{d857dd56-a1c7-49d7-9c5e-1d9ee2006589}	4/23/2020 18:00	MichaelPalaschak	4/23/2020 18:00	MichaelPalaschak		MPP	4/23/2020 16:00
2_OF	InvestigationComplete	2_OF		9	{c8096c23-a96e-4064-8657-341c0655ef66}	4/23/2020 17:47	MichaelPalaschak	4/23/2020 17:47	MichaelPalaschak		MPP	4/23/2020 16:00
3_OF	InvestigationComplete	3_OF		6	{b5535e48-62fb-45b9-84fa-b504ed4d125d}	4/23/2020 17:46	MichaelPalaschak	4/23/2020 17:46	MichaelPalaschak		MPP	4/23/2020 16:00
4_OF	InvestigationComplete	4_OF		5	{4e5745e1-a941-4baa-be5a-23b582f5c1cf}	4/23/2020 17:45	MichaelPalaschak	4/23/2020 17:45	MichaelPalaschak		MPP	4/23/2020 16:00
5_OF	InvestigationComplete	5_OF		7	{2153d03b-6e7e-4dec-95e0-b6d4d6286a89}	4/23/2020 17:46	MichaelPalaschak	4/23/2020 17:46	MichaelPalaschak		MPP	4/23/2020 16:00
6_OF	InvestigationComplete	6_OF		8	{96109896-fd1c-431f-9935-98427ed05188}	4/23/2020 17:46	MichaelPalaschak	4/23/2020 17:46	MichaelPalaschak		MPP	4/23/2020 16:00
7_OF	InvestigationComplete	7_OF		4	{8d7cceed-48a8-48d6-8c8a-d839c034dc5e}	4/23/2020 17:45	MichaelPalaschak	4/23/2020 17:45	MichaelPalaschak		MPP	4/23/2020 16:00
8_OF	InvestigationComplete	8_OF		11	{18153e8c-09a3-4752-80fe-6d6009e70f80}	4/23/2020 19:09	MichaelPalaschak	4/23/2020 19:09	MichaelPalaschak		MPP	4/23/2020 16:00
9_OF	InvestigationComplete	9_OF	Outfall is buried by sediment, town DPW uncovered Sept 2020	12	{fafc8e7a-d01c-4e85-bab5-912770e14137}	6/23/2020 18:27	KMLarson	6/23/2020 18:56	KMLarson	luemer Roa	JS	6/23/2020 16:00
10_OF	InvestigationComplete	10_OF		1	{1a789209-84bc-445e-8d47-07fa1933e004}	4/23/2020 17:45	MichaelPalaschak	4/23/2020 17:45	MichaelPalaschak		MPP	4/23/2020 16:00
11_OF	InvestigationComplete	11_OF		2	{80d98932-7efe-4ba5-a5d7-a4fca7d86592}	4/23/2020 17:45	MichaelPalaschak	4/23/2020 17:45	MichaelPalaschak		MPP	4/23/2020 16:00
12_OF	InvestigationComplete	12_OF		3	{481bfcfd-ae37-4ad7-9337-3389bd17dbc7}	4/23/2020 17:45	MichaelPalaschak	4/23/2020 17:45	MichaelPalaschak		MPP	4/23/2020 16:00

L0surveyPoint_outfall_id	L0surveyPoint_time_24hr	L0surveyPoint_temperature_f	L0surveyPoint_rainfall_last__26	L0surveyPoint_rainfall_last__27	L0surveyPoint_photo_descript_28	L0surveyPoint_land_use_in_dr_29	L0surveyPoint_land_use_in_dr_30	L0surveyPoint_section_2_outf_31	L0surveyPoint_section_2_outf_32	L0surveyPoint_outfall_shape	L0surveyPoint_outfall_shape__34
1_OF	1:57:00 PM	52			Behind houses on Camp J	Residential		single		Circular	
2_OF	7:26:00 AM	34			Flows into manhan	Residential		single		Circular	
3_OF	9:52:00 AM	41				Residential		single		Circular	
4_OF	10:08:00 AM	43				Residential		single		Circular	
5_OF	9:09:00 AM	39			Flared end corroded. Pipe	Residential		single		Circular	
6_OF	8:10:00 AM	34				Residential		single		Circular	
7_OF	11:33:00 AM	42			Sample taken from upstre	Residential		single		Circular	
8_OF	11:56:00 AM	47				Residential		single		Circular	
9_OF	1:30:00 PM	90	0	0		Residential,Open_Space_Wooded		single		Circular	
10_OF	1:40:00 PM	52			Outfall in poor condition c	Residential		single		Circular	
11_OF	1:30:00 PM	52			Discharged into Pequot Pc	Residential		single		Circular	
12_OF	1:18:00 PM	51			Outfall drops into culvert.	Residential		single		Circular	

L0surveyPoint_outfall_id	L0surveyPoint_outfall_materi_35	L0surveyPoint_outfall_materi_36	L0surveyPoint_diameterdimens_37	L0surveyPoint_slope	L0surveyPoint_submerged_in_w_39	L0surveyPoint_submerged_in_s_40	L0surveyPoint_pipe_condition	L0surveyPoint_pipe_condition_42	L0surveyPoint_outlet_structu_43	L0surveyPoint_outlet_structu_44
1_OF	CMP		36	flat	no	no	Corroded_(metal)		flared_end	
2_OF	RCP		30	steep	no	no	Good		flared_end	
3_OF	HDPE		12	moderate	no	no	Good		no_outfall_protection	
4_OF	CMP		12	flat	partially	partially	Good		other	Rocks near outfall
5_OF	CMP		12	moderate	no	no	Good		flared_end	
6_OF	HDPE		20	moderate	no	no	Good		headwall	
7_OF	CMP		12	steep	partially	partially	Other	Mostly covered, difficult to determin	no_outfall_protection	
8_OF	CMP		20	moderate	no	no	Corroded_(metal)		no_outfall_protection	
9_OF	DI/CI		10	flat	no	no	Corroded_(metal)		other	swale
10_OF	CMP		12	flat	no	partially	Corroded_(metal)		other	Small headwall
11_OF	RCP		30	moderate	no	no	Corroded_(metal)		no_outfall_protection	
12_OF	RCP		16	flat	no	no	Good		other	Inside culvert

L0surveyPoint_outfall_id	L0surveyPoint_in_stream	L0surveyPoint_is_flow_presen_46	L0surveyPoint_flow_descripti_47	L0surveyPoint_section_3_quan_48	L0surveyPoint_temperature_	L0surveyPoint_temperature_un_50	L0surveyPoint_conductivity_	L0surveyPoint_conductivity_u_52	L0surveyPoint_salinity_	L0surveyPoint_salinity_units
1_OF	no	no		no						
2_OF	yes	yes	moderate	yes	7.97	celsius	190	uS/cm	0.14	Ppt
3_OF	yes	no		no						
4_OF	yes	no		no						
5_OF	yes	yes	trickle	yes	9.04	celsius	601	uS/cm	0.43	Ppt
6_OF	no	yes	moderate	yes	8.09	celsius	444	uS/cm	0.32	Ppt
7_OF	no	yes	moderate	yes	8.23	celsius	134uS/cm	uS/cm	0.09	Ppt
8_OF	no	yes	moderate	yes	8.03	celsius	62	uS/cm	0.04	Ppt
9_OF	no	no		no						
10_OF	no	no		no						
11_OF	no	no		no						
12_OF	yes	no		no						

L0surveyPoint_outfall_id	L0surveyPoint_ammonia_mgl	L0surveyPoint_chlorine_great_56	L0surveyPoint_section_4_are__57	L0surveyPoint_is_there_an_od_58	L0surveyPoint_relative_odor__59	L0surveyPoint_odor_descripti_60	L0surveyPoint_odor_descripti_61	L0surveyPoint_is_there_any_c_62	L0surveyPoint_relative_color_63	L0surveyPoint_color_descript_64	L0surveyPoint_color_descript_65	L0surveyPoint_is_there_any_t_66
1_OF			no		none	No_Odor		no	none	No_Color		no
2_OF	0.3	0.66	no		none	No_Odor		no	none	No_Color		no
3_OF			no		none	No_Odor		no	none	No_Color		no
4_OF			no		none	No_Odor		no	none	No_Color		no
5_OF	0.25	0	yes	no	none	No_Odor		no	none	No_Color		no
6_OF	0.25	0.18	no		none	No_Odor		no	none	No_Color		
7_OF	0	0.02	no		none	No_Odor		no	none	No_Color		no
8_OF	0.3	0.06	no		none	No_Odor		no		No_Color		no
9_OF			no									
10_OF			no		none	No_Odor		no	none	No_Color		no
11_OF			no		none	No_Odor		no	none	No_Color		no
12_OF			no		none	No_Odor		no	none	No_Color		no

L0surveyPoint_outfall_id	L0surveyPoint_relative_turbi_67	L0surveyPoint_are_any_floata_68	L0surveyPoint_relative_float_69	L0surveyPoint_floatables_des_70	L0surveyPoint_floatables_des_71	L0surveyPoint_section_5_are__72	L0surveyPoint_are_deposits_o_73	L0surveyPoint_depositsstains_74	L0surveyPoint_depositsstains_75	L0surveyPoint_depositsstains_76	L0surveyPoint_is_surrounding_77
1_OF	none	no	none	No_Floatables		no				None except rust	
2_OF	none	no	none	No_Floatables							
3_OF	none	no	none	No_Floatables		no				None observed	
4_OF	none	no	none	No_Floatables		no				None observed	
5_OF	none	yes	ewslight_origin_not_obvi	Suds		no				None observed	
6_OF	none	no	none	No_Floatables		no					
7_OF	none	no	none	No_Floatables		no				None observed	
8_OF	none	no	none	No_Floatables		no				None observed	
9_OF						no					
10_OF	none	no	none	No_Floatables		no				None observed	
11_OF	none	no	none	No_Floatables		no				staining, but metal is corro	
12_OF	none	no	none	No_Floatables		no				None observed	

L0surveyPoint_outfall_id	L0surveyPoint_vegetation_des_78	L0surveyPoint_surrounding_ve_79	L0surveyPoint_is_abnormal_ve_80	L0surveyPoint_abnormal_veget_81	L0surveyPoint_abnormal_veget_82	L0surveyPoint_is_there_visib_83	L0surveyPoint_erodibility_de_84	L0surveyPoint_erodibility_co_85
1_OF		Healthy, no issues						Erosion looks minimal
2_OF		Healthy, no issues						
3_OF		All healthy, not crowding out						Slope is moderate with no out
4_OF		Healthy						Potential due to lack of protec
5_OF		Healthy, no issues						Could get crushed by rocks, or
6_OF		Healthy						No signs of erosion issues
7_OF		All healthy. Utility company h						High potential due to slope an
8_OF		Healthy, no issues						No protection, sediment could
9_OF								
10_OF		Healthy, no issues						Already covered by sediment a
11_OF		No surrounding vegetation						On beach
12_OF		No vegetation						Unlikely, in the road

L0surveyPoint_outfall_id	L0surveyPoint_is_pool_qualit_86	L0surveyPoint_field_82	L0surveyPoint_pool_quality_d_88	L0surveyPoint_field_83	L0surveyPoint_is_pipe_benthi_90	L0surveyPoint_benthic_growth_91	L0surveyPoint_benthic_growth_92	L0surveyPoint_benthic_growth_93
1_OF				Discharged into small p				None observed
2_OF				No pool				None found
3_OF				No pool observed				None observed
4_OF				No pool				None observed
5_OF				No pool				Did not observe
6_OF				No pool				Some moss at base of outf
7_OF				No pool				Not observed, but outfall i
8_OF				No pool				Not observed
9_OF								
10_OF				No pool				None observed.
11_OF				No pool				No benthic growth
12_OF				No pool				None observed

L0surveyPoint_outfall_id	L0surveyPoint_section_6_over_94	L0surveyPoint_section_7_data_95	L0surveyPoint_section_7_data_96	L0surveyPoint_where_were_sam_97	L0surveyPoint_intermittent_f_98	L0surveyPoint_section_8_any__99	L0surveyPoint_notes
1_OF	unlikely	None			no		
2_OF		Surfactants_,Ammonia,E.	Total nitrogen	Flow	no		
3_OF	unlikely	None			no		
4_OF	unlikely	None			no		
5_OF	unlikely	Surfactants_,Ammonia,E.	Total nitrogen	Flow	no		
6_OF	unlikely	Surfactants_,Ammonia,E.	Total nitrogen	Flow	no		
7_OF	unlikely	Surfactants_,E._Coli,Amn	Total nitrogen	Flow	no		
8_OF	unlikely	Surfactants_,Ammonia,E.	Total nitrogen	Flow	no		
9_OF	unlikely						
10_OF	unlikely	None			no		
11_OF	unlikely	None			no		
12_OF	unlikely	None			no		

Outfall Sampling Results Summary - Southampton, MA

Location				Laboratory Analysis [1]				Water Quality Meter/Test Kit [1]					
Date	Outfall ID	Street	Sample Location	Ammonia	Surfactants	E. coli	Total Nitrogen	Temperature	Salinity [3]	Conductivity	Chlorine	Dissolved Oxygen	Ammonia
				mg/L	mg/L	col/100mL	mg/L	°F	ppt	µS/cm [2]	mg/L	mg/L	mg/L
4/23/2020	2_OF	Pomeroy Meadow Road	Outfall	ND	ND	ND	1.7	46.4	0.14	190	0.66	-	0.30
4/23/2020	5_OF	Duggan Lane	Outfall	ND	ND	ND	2.6	48.3	0.43	601	0.00	-	0.25
4/23/2020	6_OF	Meadow Lane	Outfall	ND	ND	ND	4.0	46.6	0.32	444	0.18	-	0.25
4/23/2020	7_OF	Brickyard Road	Upstream Catch Basin	ND	ND	ND	0.6	46.8	0.09	134	0.02	-	0.00
4/23/2020	8_OF	Brickyard Road	Outfall	ND	ND	ND	0.4	46.4	0.04	62	0.06	-	0.30

REPORTING LIMITS
Ammonia = 0.075 mg/L
Surfactants = 0.050 mg/L
E. coli = 2.0 col/100mL
Total Nitrogen = 0.075 mg/L
"ND" = none detected

COLOR KEY
(benchmarks are bold)

	Ammonia	Surfactants	E. coli	Total Nitrogen	Temperature [a]	Salinity	Conductivity	Chlorine	Dissolved Oxygen [a]	Ammonia
	mg/L	mg/L	CFU/100 mL	mg/L	°F	ppt	µS/cm	mg/L	mg/L	mg/L
	≥ 6.000	≥ 1.000	≥ 10,000	< 2.13		≥ 1.00	**≥ 2,000**	≥ 1.00		≥ 6.0
	≥ 1.000	≥ 0.500	≥ 1,260	< 1.35		≥ 0.75	≥ 1,500	≥ 0.30		≥ 1.0
	≥ 0.500	**≥ 0.250**	**≥ 235**	**< 0.57**	**≥ 83.0**	**≥ 0.50**	≥ 1,000	**≥ 0.02**	**< 5.0**	**≥ 0.5**
	< 0.500	< 0.250	< 235	< 0.57	< 83.0	< 0.50	< 1,000	< 0.02	≥ 5.0	< 0.5

Notes for Results Summary:

(1) "-" means no analysis was completed

(2) µS/cm is equivalent to µmhos/cm

(3) Salinity was measured in µS/cm units on the YSI Meter and then converted to ppt

Benchmark Sources:

Ammonia, Surfactants, and Chlorine - *EPA General Permit for Stormwater Discharges from Small MS4 in Massachusetts*
E. coli, Temperature, and Dissolved Oxygen - *314 CMR 4.00: Massachusetts Surface Water Quality Standards*
Salinity - *EPA Volunteer Estuary Monitoring: A Methods Manual*
Conductivity - *Center for Watershed Protection Illicit discharge Detection and Elimination Guidance Manual*