Southampton MS4 Wet Weather Outfall Sampling

TO: Randall Kemp, Highway Superintendent, Town of Southampton

FROM: Haley Rivers and Tracy Adamski, AICP, Tighe & Bond

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Background

Per Part 2.3.4.8 of the 2016 Small MS4 General Permit and the Town of Southampton's Illicit Discharge Detection and Elimination (IDDE) Program, the Town must investigate each catchment associated with an outfall or interconnection within the Town's MS4 for possible illicit discharges or connections. The source of any illicit discharge identified during dry or wet weather must be isolated, confirmed, and removed.

As described in the Catchment Investigation Procedures added to the Town's IDDE Plan on December 30, 2019, when one or more of the system vulnerability factors (SVFs) described in Section 2.3.4.8 of the 2016 Small MS4 General Permit are present in a drainage catchment area, the Town must sample and inspect the associated outfall during wet weather conditions to determine whether wet weather-induced high groundwater in areas served by septic systems result in the discharge of sanitary waste flow to the MS4.

In Permit Year 5, Tighe & Bond continued catchment investigations by performing wet weather sampling at outfalls in catchments with a minimum of one SVF or where dry weather screening identified potential issues. While no catchments with SVFs were identified during the development of Catchment Investigation Procedures in the IDDE Plan, this effort focused on following up on catchments where dry weather outfall sampling results indicated potential issues.

Four outfalls were selected for wet weather outfall screenings that previously had the highest values for indicators and had the most potential for SVFs; however none met the wet weather screening requirements indicated by the 2016 Small MS4 General Permit. The screenings were completed in accordance with the written Catchment Investigations Procedures developed in December 2019. The following summarizes the work completed; this summary and the Excel document enclosed with this memo will be provided to the EPA and the MassDEP in the Year 5 Annual Report.

Actions Completed

Wet Weather Outfall sampling occurred on September 13, 2022, between 7am and 12pm. The area had received approximately 1 inch of rain in the 72 hours prior to sampling and had received 0.58 inches of rain in 24 hours prior to sampling, with most of that rainfall occurring overnight just prior to the conducted fieldwork. It rained lightly until about 10am while samples were being taken.

Sampling was conducted through three different methods: Ammonia and Chlorine were tested on-site using test kits; Temperature, Salinity, Conductivity, and Dissolved Oxygen were tested on-site using a Horiba Meter; and water samples for Ammonia, Surfactants, E. Coli, and Total Nitrogen were taken in the field and sent to Alpha Analytical for laboratory analysis. The results of this sampling are included in the enclosed Excel spreadsheet.

Results

Sampling data are included in the enclosed Excel spreadsheet. The spreadsheet has two tabs, as follows:

- Sampling Data
- Benchmark Info Sources

Based on the wet weather outfall screening sampling results, there is no evidence of an illicit discharge within Southampton's MS4.

Recommendations and Next Steps

Tighe & Bond has worked with Town staff since 2019 to investigate Southampton's MS4 for evidence of illicit discharges in accordance with the written Catchment Investigation Procedures developed in December 2019. Dry weather outfall screenings were completed in 2020. No key junction manholes or catch basins were identified within Southampton's MS4, and according to the Catchment Investigation Procedures, "If a catchment does not include a junction manhole, the dry weather screening completed at the catchment's outfall shall meet the manhole inspection requirement." Therefore, Southampton's dry weather investigations were complete following dry weather outfall screening in 2020. Following the wet weather outfall screening in 2022, Southampton's investigations are to be considered complete.

Per EPA's implementation schedule, the Town should continue to look for indicators of illicit discharges during catch basin cleaning and day-to-day maintenance operations, as well as to continue to complete any outstanding inspections, investigations, and sampling of its MS4 during upcoming Permit Years. As requirements are completed, Town staff should consider refining the current mapping as additional data is collected.

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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
9/13/2022	2_OF	Pomeroy Meadow Road	Outfall	0.221	0.120	866.00	1.30	65.9	0	0.092	0.31	4.18	0.25
9/13/2022	5_OF	Duggan Lane	Outfall	0.075	ND	866.44	2.40	66.9	0.1	0.246	0.13	13.4	0.25
9/13/2022	6_OF	Meadow Lane	Outfall	ND	ND	1,046.24	2.00	67.4	0.00	0	0.34	28.92	0.25
9/13/2022	7_OF	Brickyard Road	Upstream Catch Basin	ND	0.080	1,413.61	0.64	67.9	0.00	0	0.27	5.04	0.00
	8_OF	Brickyard Road	Outfall										

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*