Illicit Discharge Detection and Elimination (IDDE) Plan

Prepared for
Town of Braintree, Massachusetts
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Section 1: Introduction

1.1 MS4 Permit

This Illicit Discharge Detection and Elimination (IDDE) Plan has been developed by the Town of Braintree (the Town) to address the requirements of the United States Environmental Protection Agency Region 1's 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereafter referred to as the "MS4 Permit."

The MS4 Permit requires that Braintree address six Minimum Control Measures. Minimum Control Measure 3 requires the permittee to implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges. The IDDE program must be recorded in a written (hardcopy or electronic) document. This IDDE Plan has been prepared to address this requirement.

1.2 Allowable Non-Stormwater Discharges

The following categories of non-storm water discharges are allowed under the Town's stormwater ordinance:

- Department of Public Works ice and snow control operations
- Flows resulting from fire-fighting activities
- Street and pavement wash waters
- Natural flow from riparian habitats and wetlands
- Diverted tide, river or stream flows
- Water main, hydrant flushing and other discharges from potable water sources associated with routine maintenance of the water distribution system
- Uncontaminated groundwater or infiltration of groundwater
- Uncontaminated springs
- Rising ground water
- Uncontaminated water from sump pumps and other pumps that remove floodwaters from basements
- Water discharge from irrigation or water of lawns, trees, landscaping and gardens
- Noncommercial car washing
- Waters from residential property management activities including washing walkways, patios, house siding and windows, providing the wash water does not contain detergents
- Swimming pool dischargers that have been de-chlorinated

Other non-stormwater discharges are allowed if the owner has obtained a Stormwater Management Permit from the Department, are in compliance with any requirements contained in the Town's Stormwater Management Plan, and if appropriate, an Industrial Activity Permit, Construction Activity Permit, or a NPDES Permit Exclusion from EPA.

1.3 Illicit Discharges

An "illicit discharge" is any discharge to a drainage system that is not composed entirely of stormwater and is not an allowable non-stormwater discharge (see Section 1.2 for a list of allowable non-stormwater discharges).

Illicit discharges may take a variety of forms. Illicit discharges may enter the drainage system through direct or indirect connections. Direct connections may be relatively obvious, such as cross-connections of sewer services to the storm drain system. Indirect illicit discharges may be more difficult to detect or address, such as failing septic systems that discharge untreated sewage to a ditch within the Town, or a sump pump that discharges contaminated water on an intermittent basis. Illicit discharges may also be episodic such as dumping used oil, pet wastes (or other pollutant) into catch basins, or a sanitary sewer overflow getting into storm drains.

Regardless of how they occur, when not addressed, illicit discharges can contribute high levels of pollutants to surface waters including heavy metals, toxics, oil, grease, solvents, nutrients, and pathogens.

Elimination of some discharges may require substantial costs and efforts, such as funding and designing a project to reconnect sanitary sewer laterals. Others, such as dog waste management, can be accomplished by outreach in conjunction with the minimal additional cost of dog waste bins or by implementing municipal household hazardous waste collection programs.

1.4 Impaired Receiving Waters

Table 1-1 lists the "impaired waters" within the boundaries of Braintree and are based on the draft 2016 Massachusetts Integrated List of Waters produced by MassDEP. Impaired waters are water bodies that do not meet water quality standards for one or more designated use(s) such as recreation or aquatic habitat.

Table 1-1. Impaired Waters – Braintree, Massachusetts

Water Body Name	Segment ID	Category[1]	Impairment(s)	Associated Approved TMDL[2]
Cranberry Brook	MA 74-22	5	E.coli	None
Cochato River	MA 74-06	5	E.coli, fecal coliform, D.O, DDT and chlordane in fish tissue	Yes[3]
Farm River	MA 74-07	5	E.coli	None
Monatiquot River	MA 74-08	5	E.coli, D.O., fecal coliform aquatic macroinvertebrate bioassessments	Yes[3]
Monatiquot River	MA 74-08	4c	physical substrate habitat alterations	None
Town Brook	MA 74-09	5	E.coli, fecal coliform aquatic macroinvertebrate bioassessments	Yes[3]
Town Brook	MA 74-09	4c	Flow regime alteration, physical substrate habitat alterations	None
Weymouth Fore River	MA 74-14,	5	E-coli, fecal coliform, PCB in fish tissue, other- contaminants fish and shellfish	Yes[3]

Notes:

1. *Category definitions:*
   - *Category 4a Waters – impaired water bodies with a completed Total Maximum Daily Load (TMDL). Currently there are no approved TMDLs for waters within the boundaries of the Town.*
   - *Category 4c Waters – impaired water bodies where the impairment is not caused by a pollutant. No TMDL required.*
   - *Category 5 Waters – impaired water bodies that require a TMDL.*
2. *"Approved TMDLs" are those that have been approved by EPA as of the date of June 2019.*
3. *Source: Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds, October 2018.*

There are currently four water bodies subject to the pathogen TMDL established by the *Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir and Mystic Watershed October 2018*. The MS4 permit requires permittees, that discharge to waters where bacteria is the cause of the impairment, to implement the practices in Section III of Appendix H of the MS4 permit. Those requirements include additional public education on the proper handling of pet wastes and conducting an IDDE program. For the latter, the catchment areas discharging to these impaired waters shall be considered Problem Areas or High Priority during IDDE implementation. The full text of Appendix H, Section III appears in Appendix D of this plan.

1.5 IDDE Program Goals, Framework and Timeline

The goals of the IDDE program are to find and eliminate illicit discharges to municipal separate storm sewer systems and to prevent illicit discharges from happening in the future. The program consists of the following major components as outlined in the MS4 Permit:

- Legal authority and regulatory mechanism to prohibit illicit discharges and enforce this prohibition
- Storm system mapping
- Inventory and ranking of outfalls
- Dry weather outfall screening
- Catchment investigations
- Identification/confirmation of illicit sources
- Illicit discharge removal
- Follow-up screening
- Employee training

The IDDE investigation procedure framework is shown in Figure 1-1. The required timeline for implementing the IDDE program is shown in Table 1-2.

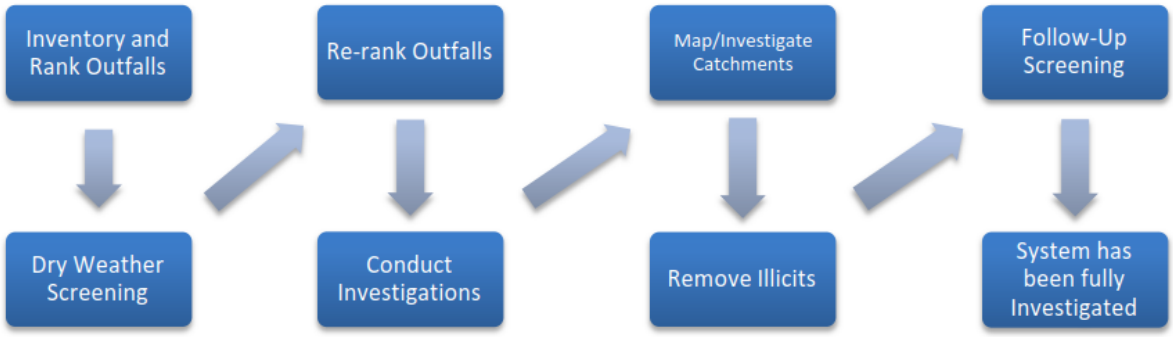

Figure 1-1. IDDE Investigation Procedure Framework

Table 1-2. IDDE Program Implementation						
IDDE Program Requirement	Completion Date from Effective Date of Permit					
	1 Year	1.5 Years	2 Years	3 Years	7 Years	10 Years
Written IDDE Program Plan	X					
SSO Inventory	X					
Written Catchment Investigation Procedure		X				
Phase I Mapping			X			
Phase II Mapping						X
IDDE Regulatory Mechanism or By-law (if not already in place)				X		
Dry Weather Outfall Screening				X		
Follow-up Ranking of Outfalls and Interconnections				X		
Catchment Investigations – Problem Outfalls					X	
Catchment Investigations – all Problem, High and Low Priority Outfalls						X

1.6 Work Completed to Date

The 2003 MS4 Permit required Braintree to develop a plan to detect illicit discharges that included a combination of the following: storm system mapping, adopting a regulatory mechanism to prohibit illicit discharges and enforce this prohibition, and identifying tools and methods to investigate suspected illicit discharges. Braintree was also required to define how confirmed discharges would be eliminated and how the removal would be documented.

Braintree has completed the following IDDE program activities consistent with the 2003 MS4 Permit requirements:

- Developed a map of outfalls and receiving waters
- Adopted an IDDE Ordinance
- Developed procedures for locating illicit discharges (i.e., visual screening of outfalls for dry weather discharges, CCTV)
- SSO inventory
- Dry weather outfall screening
- Dry weather outfall water quality sampling
- Additional storm system mapping, including the locations of catch basins, manholes and pipe connectivity

Section 2: Authority and Statement of IDDE Responsibilities

2.1 Legal Authority

Braintree adopted a Stormwater Ordinance (Chapter13.14) on May 29, 2018. A copy of the Stormwater Management Ordinance is provided in Appendix A. The Stormwater Management Ordinance provides Braintree with adequate legal authority to:

- Prohibit illicit discharges
- Investigate suspected illicit discharges
- Eliminate illicit discharges, including discharges from properties not owned by or controlled by the MS4 that discharge into the MS4 system
- Implement appropriate enforcement procedures and actions

The Stormwater Management Ordinance gives the Department of Public Works the authority to establish regulations related to stormwater management. The Department has developed stormwater regulations which were approve in June 2019. The Department has also reviewed the Town's current ordinances and regulations related to land use for consistency with the 2016 MS4 Permit and has provided the results of that review to the Planning Department and Conservation Commission.

2.2 Statement of Responsibilities

The Department of Public Works is the lead municipal department responsible for implementing the IDDE program pursuant to the provisions of the Stormwater Management Ordinance. The Stormwater Division within the Department of Public Works is primarily responsible for implementing the stormwater program and works closely with other Department of Public Works divisions including Highway, Sewer and Engineering. Coordination is accomplished through weekly Departmental meetings as well as through the office of the Director. The Stormwater Division also regularly coordinates with the planning Department and Conservation Commission with particular focus on implementing the New Development and Redevelopment requirements of the MS4 Permit. There are a very limited number of septic systems still in use within the Town so coordination with the Health Department is generally on a case by case basis.

The Department of Public Works has developed a permitting program that will require a permit for all new connections to the Town's storm drain system. This will promote coordination between the Department of Public Works and other departments and help ensure that the New Development and Redevelopment standards are being met.

Section 3: Stormwater System Mapping

The Town of Braintree has developed a map of its stormwater system in accordance with the requirements of the 2003 MS4 Permit. A copy of the existing storm system map is provided in Appendix B.

The 2016 MS4 Permit has additional mapping requirements intended to facilitate the identification of key infrastructure, factors influencing proper system operation, and the potential for illicit discharges.

The Department of Public Works is responsible for updating the stormwater system mapping pursuant to the 2016 MS4 Permit. The Town of Braintree will provide an update of the Town's mapping efforts in each annual report. The stormwater mapping is included in Appendix B and will be updated as new data becomes available.

The MS4 Permit requires the storm system map to be updated in two phases. The Phase I mapping requirements must be completed by July 1, 2020. The Phase 2 requirements must be completed by July 1, 2028. The mapping requirements and the status of the Town's GIS datasets are shown in Table 3-1.

Table 3-1. MS4 Permit Mapping Requirements	
Mapping Requirements	Status
Phase I: Completion by July 1, 2020	
Outfalls and receiving waters	Complete
Open channel conveyances (swales, ditches, etc.)	Under development
Interconnections with other MS4s and other storm sewer systems	Under development
Municipally owned stormwater treatment structures	Under development
Water bodies identified by name and indication of all use impairments as identified on the most recent EPA approved Massachusetts Integrated List of Waters report	Complete
Initial catchment delineations	Complete
Phase II: Completion by July1, 2028	
Outfall coordinates refined to +/- 30 feet	Not begun
Pipes	Partially complete
Manholes	Partially complete
Catch basins	Partially complete
Refined catchment delineations	Not begun
Municipal sanitary sewer system (if available)	Complete

The MS4 Permit also includes recommendations for additional mapping data:

- Storm sewer material, size (pipe diameter), age
- Sanitary sewer system material, size (pipe diameter), age
- Privately owned stormwater treatment structures
- Where a municipal sanitary sewer system exists, properties known or suspected to be served by a septic system, especially in high density urban areas
- Areas where the permittee's stormwater system has received or could receive flow from septic system discharges
- Seasonal high-water table elevations impacting sanitary alignments
- Topography
- Orthophotography
- Alignments, dates and representation of work completed of past illicit discharge investigations
- Locations of suspected confirmed and corrected illicit discharges with dates and flow estimates

The Town will incorporate this information into its mapping datasets as the information becomes available. The topography and orthophotography are readily available through MassGIS.

Section 4: Sanitary Sewer Overflows (SSOs)

The 2016 MS4 Permit requires Braintree to prohibit illicit discharges, including sanitary sewer overflows (SSOs), to the separate storm sewer system. SSOs are discharges of untreated sanitary wastewater from a municipal sanitary sewer that can contaminate surface waters, cause serious water quality problems and property damage, and threaten public health. SSOs occurs when sanitary sewers cannot adequately convey all of the flow entering the sanitary sewer system. SSOs can be caused by blockages, line breaks, sewer power failures, improper sewer design, and vandalism.

As shown in Appendix I, the Town of Braintree has completed an inventory of SSOs that discharged to the MS4 during the five years prior to July 1, 2018. The inventory includes SSOs that occurred during wet and dry weather.

The MS4 Permit requires that the Town eliminate SSOs as expeditiously as possible and take interim measures to minimize the discharge of pollutants to and from its MS4 until the SSO is eliminated. Upon becoming aware of an SSO to the MS4, the Town of Braintree must provide verbal notice to EPA within 24 hours and written notice to EPA and MassDEP within five days. Written notices should be directed to the contacts listed in Table 4-1.

Table 4-1. SSO Notification List

Name	Agency	Phone Number	Fax Number	Email Address
David Burns	Mass DEP	(508) 946-2738	(508) 947-6557	david.burns@state.ma.us
Douglas Koopman	US EPA	(617) 918-1747	(617) 918-0747	koopman.douglas@epa.gov
Stephen Cullen	MWRA	(617) 305-5921	(617) 371-1627	Stephen.Cullen@mwra.com
Marybeth McGrath	Braintree Board of Health Department	(781)794-8090	(781) 794-8098	mmcgrath@braintreema.gov
Paul Milone	Weymouth Harbormaster	(617)947-5667	(781)331-8215	pmilone@weymouth.ma.us

The inventory in Appendix I will be updated by the Sewer Division when new SSOs are detected. The SSO inventory will be included in the annual report, including the status of mitigation and corrective measures to address each identified SSO.

Section 5: Assessment and Priority Ranking of Outfalls

The 2016 MS4 Permit requires Braintree to do an assessment and priority ranking of outfalls. The ranking will be based on the potential of the outfalls to have illicit discharges and SSOs and the related risk to public and environmental health. The ranking helps to prioritize the IDDE investigations and meet the Permit milestones.

5.1 Outfall Catchment Delineations

The catchment area for Braintree's outfalls have been delineated. These catchment areas define the boundaries of the areas draining to each outfall. The catchments were delineated using topographic contours and the location of the Town's drainage infrastructure. As described in Section 3, initial catchment delineations were completed during the Phase I mapping and will be refined as part of the Phase II mapping.

5.2 Outfall and Interconnection Inventory and Initial Ranking

Braintree has completed an initial outfall and interconnection inventory. The inventory and ranking will be updated each year in the annual report.

The Town has evaluated the likelihood that the outfalls and interconnections are contaminated by illicit discharges and SSOs. The Town has also evaluated the potential risk to public and environmental health from contamination. The evaluation was based on the following outfall ranking criteria:

- **Outfall screening/sampling results** – Outfalls with screening/sampling results that meet one or more of the criteria below are considered to be at risk for sewer contamination.
  - Olfactory or visual evidence of sewage.
  - Ammonia greater than or equal to 0.5 mg/L, surfactants greater than or equal to 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water.
  - Ammonia greater than or equal to 0.5 mg/L, surfactants greater than or equal to 0.25 mg/L, and detectable levels of chlorine.
- Past discharge complaints and reports.
- **Poor receiving water quality** – Waters the meet one or more of the following criteria may be receiving illicit discharges:
  - Bacteria concentrations that exceed water quality standards.
  - Ammonia levels above 0.5 mg/l.
  - Surfactants levels greater than or equal to 0.25 mg/l.
- **Density of generating sites** – Generating sites are places with an elevated potential to contribute to illicit discharges. Examples of these types of sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas. Storm drains in areas with generating sites have a higher likelihood of receiving illicit discharges.
- **Age of development and infrastructure** – In general, storm drains located in areas of the Town more than 40 years old are considered to be at greater risk for receiving illicit discharges. Storm drains located in areas that are less 20 years old typically have a lower illicit discharge potential.
- **Sewer conversion** – Storm drains located in catchments that were once serviced by septic systems and have been converted to sewer connections may have a high potential for illicit discharges.
- **Surrounding density of aging septic systems** – Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.

- **Culverted streams** – Any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
- **Water quality limited waterbodies** – Water bodies that receive a discharge from the MS4 or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment.

After evaluating the catchments of the outfalls and interconnections, the outfalls were classified into one of the following categories:

1. **Problem Outfalls**: Outfalls/interconnections with known or suspected contributions from illicit discharges, including outfalls/interconnections where screening/sampling has indicated likely sewer inputs.
2. **High Priority Outfalls**: Outfalls/interconnections that have not been classified as Problem Outfalls and that are:
   - Discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds.
   - Determined by the Town as a high priority based on the outfall ranking criteria listed above or other available information.
3. **Low Priority Outfalls**: Outfalls/interconnections determined by the Town as low priority based on the criteria listed above or other available information.
4. **Excluded Outfalls**: Outfalls/interconnections excluded from the IDDE program because they have no potential for illicit discharges. This category is limited to roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; drainage for athletic fields, parks or undeveloped green space and associated parking without services; cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.

The outfall inventory and priority ranking matrix is presented in Appendix F. As Braintree has already completed dry weather outfall screening and sampling of all of its outfalls (see Section 6), the inventory and ranking matrix has been updated to reflect this information. So, while this subsection discusses the initial ranking of outfalls, the information shown in Appendix F actually shows the ranking after having been refined based on extensive field investigations as discussed in Section 6.6.

Section 6: Dry Weather Outfall Screening and Sampling

There are two primary goals of the dry weather screening and sampling. The first goal is to identify outfalls that are contaminated with sewage. This is accomplished through outfall screening and sampling. The second goal is to locate the sources of the sewage contamination. This is accomplished through upstream tracking of the contaminated flows. Both the outfall screening/sampling and the upstream tracking are performed during dry weather, when stormwater-related flows are at a minimum. For the purposes of this IDDE Program, dry weather is defined as periods of time when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and there is no significant snowmelt.

The MS4 Permit requires all outfalls/interconnections (excluding Problem and excluded Outfalls) to be inspected for the presence of dry weather flow. The Stormwater Division is responsible for conducting dry weather outfall screening, starting with High Priority outfalls, followed by Low Priority outfalls, based on the initial priority rankings described in the previous section. The outfall screening/sampling conducted by the Town from 2017 through 2019 satisfies the dry weather outfall/screening requirements of the 2016 MS4 Permit.

6.1 Dry Weather Screening/Sampling Procedure

6.1.1 General Procedure

The basic steps of the dry weather screening/sampling of the outfalls are outlined below:

- Locate the outfall
- Record the x, y coordinates of the outfall
- Take photographs of the outfall
- Perform observations and fill out the inspection dry weather screening/sampling form
- If flow is present,
  - Collect a bacteria sample and send it to a laboratory for analysis
  - Perform physical measurements for pH, temperature, conductivity and salinity
  - Perform field test kits for ammonia, surfactants and chlorine

If the outfall cannot be accessed, the procedures outlined above should be performed at the nearest manhole upstream of the outfall.

The Town has adopted the standard operating procedure (SOP) contained in Appendix E for dry weather outfall screening and sampling. The SOP includes field equipment needs, sampling and analysis procedures and a health and safety plan.

6.2 Interpreting Outfall Screening/Sampling Results

If one or more of the criteria listed below are met, the outfall is considered to be potentially contaminated with sewage:

- Visual evidence of sewage.
- Sewage odors.
- Ammonia greater than or equal to 0.5 mg/L, surfactants greater than or equal to 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water.
- Ammonia greater than or equal to 0.5 mg/L, surfactants greater than or equal to 0.25 mg/L, and detectable levels of chlorine.

The water quality standard for bacteria in freshwater is based on E. Coli bacteria with concentrations greater than 235 colonies/100 ml being in excess of the water quality standard. The water quality standard for marine and brackish waters is based on enterococcus bacteria with concentrations greater than 61 colonies/100 ml being in excess of the water quality standard.

6.3 Upstream Tracking of Contaminated Flows

If an outfall is suspected of sewage contamination, investigations are performed in the upstream drainage system to identify the source of contamination. If the sewage contamination is determined while in the field, it is generally desirable to commence upstream tracking immediately as the contaminated flow could be intermittent and not be present during a follow-up investigation. All the contamination criteria listed in Section 6.2 can be evaluated in the field with the exception of bacteria (bacteria samples must be sent to a laboratory and the results are typically not available for several days to a week).

The upstream source tracking begins at the first accessible manhole upstream of the outfall. The manhole's inlet pipes are inspected for visual/olfactory evidence of contamination and for dry weather flow. If dry weather flow is present, field test kits are used to measure ammonia, surfactants and chlorine. If any of the thresholds from Section 6.2 are exceeded, the flow from that pipe is considered to be potentially contaminated and the investigations continue upstream of that pipe. The investigations continue in this fashion, working upstream manhole by manhole until a manhole is found that has pipe inlets with no flow or no contaminated flow. This manhole is considered to be free of sewage contamination. Since contamination was present in the downstream manhole, the downstream pipe is flagged as suspected of being the source of contamination. The methodology for the upstream source tracking is detailed in the SOP for Dry Weather Outfall Screening and Sampling (see Appendix E

6.4 Identifying Illicit Sources

Once the source of an illicit discharge is isolated between two manholes, further investigation techniques are used to pinpoint the source of the illicit discharge.

6.4.1 CCTV/Video Inspection

CCTV is a method of source isolation that involves the use of mobile video cameras that are guided remotely through stormwater drain lines to observe possible illicit discharges. IDDE program staff can review the videos and note any visible illicit discharges. CCTV inspections are the Town's preferred method for isolating illicit discharges.

6.4.2 Sandbagging

This technique can be particularly useful when attempting to isolate intermittent illicit discharges or those with very little perceptible flow. The technique involves placing sandbags or similar barriers (e.g., caulking, weirs/plates, or other temporary barriers) within outlets to manholes to form a temporary dam that collects any intermittent flows that may occur. Sandbags are typically left in place for 48 hours and should only be installed when dry weather is forecast. If flow has collected behind the sandbags/barriers after 48 hours it can be assessed using visual observations or by sampling. If no flow collects behind the sandbag, the upstream pipe network can be ruled out as a source of the intermittent discharge. Finding appropriate durations of dry weather and the need for multiple trips to each manhole makes this method both time-consuming and somewhat limiting.

6.4.3 Smoke Testing

Smoke testing involves injecting non-toxic smoke into drain lines and noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the system itself. Typically, a smoke bomb or smoke generator is used to inject the smoke into the system at a catch basin or manhole and air is then forced through the system. Test personnel are placed in areas where there are suspected illegal connections or cracks/leaks, noting any escape of smoke (indicating an illicit connection or damaged storm drain infrastructure). It is important when using this technique to make proper notifications to area residents and business owners as well as local police and fire departments. Smoke testing notification can include robocalls, notification flyers, and email for single family homes, businesses and building lobbies for multi-family dwellings.

If the initial test of the storm drain system is unsuccessful then a more thorough smoke-test of the sanitary sewer lines can also be performed. Unlike storm drain smoke tests, buildings that do not emit smoke during sanitary sewer smoke tests may have problem connections and may also have sewer gas venting inside, which is hazardous.

It should be noted that smoke may cause minor irritation of respiratory passages. Residents with respiratory conditions may need to be monitored or evacuated from the area of testing altogether to ensure safety during testing.

6.4.4 Dye Testing

Dye testing involves flushing non-toxic dye into plumbing fixtures such as toilets, showers, and sinks and observing nearby storm drains and sewer manholes as well as stormwater outfalls for the presence of the dye. Similar to smoke testing, it is important to inform local residents and business owners. Police, fire, and local public health staff should also be notified prior to testing in preparation of responding to citizen phone calls concerning the dye and their presence in local surface waters.

A team of two or more people is needed to perform dye testing (ideally, all with two-way radios). One person works inside the building, while the others are stationed at the appropriate storm sewer and sanitary sewer manholes (which should be opened) and/or outfalls. The person inside the building adds dye into a plumbing fixture (i.e., toilet or sink) and runs a sufficient amount of water to move the dye through the plumbing system. The person inside the building then radios to the outside crew that the dye has been dropped, and the outside crew watches for the dye in the storm sewer and sanitary sewer, recording the presence or absence of the dye.

The test can be relatively quick (about 30 minutes per test), effective (results are usually definitive), and inexpensive. Dye testing is best used when the likely source of an illicit discharge has been narrowed down to a few specific houses or businesses.

6.4.5 IDDE Canines

Dogs specifically trained to smell human related sewage are becoming a cost-effective way to isolate and identify sources of illicit discharges. While not widespread, the use of IDDE canines is growing. The use of IDDE canines is not recommended as a standalone practice for source identification; rather it is recommended as a tool to supplement other conventional methods to fully verify sources of illicit discharges.

6.5 Illicit Discharge Removal

When the specific source of an illicit discharge is identified, the Town of Braintree will notify the property owner that an illicit discharge exists and that it must be removed in a timely fashion. The Town has authority through its ordinances to enforce the removal of illicit discharges.

The identification and removal of illicit discharges will be documented in the Town's annual report. The following information will be provided for each confirmed source:

- The location of the discharge and its source(s)
- A description of the discharge
- The method of discovery
- Date of discovery
- Date of elimination, mitigation or enforcement action OR planned corrective measures and a schedule for completing the illicit discharge removal
- Estimate of the volume of flow removed

6.5.1 Confirmatory Outfall Screening

After all of the identified illicit discharges upstream of an outfall have been removed, the Town will perform dry weather screening of that outfall to confirm that all of the illicit discharges have been removed. If the screening indicates evidence of additional illicit discharges, upstream source tracking will be reinitiated.

Furthermore, if the outfall has a catchment with characteristics that put it at more risk for illicit discharges (e.g., storm drains in the same trench as sanitary sewers, frequent SSOs), wet weather screening will also be required. This requirement is discussed further in Section 7.

The MS4 Permit requires that the confirmatory screening be performed within one year of the removal of the identified illicit discharges.

6.6 Follow-up Ranking of Outfalls and Interconnections

The Town of Braintree developed its initial outfall and interconnection rankings using the ranking scheme outlined in Section 5.2. The rankings have been updated based on the dry weather outfall screening and sampling. The results are shown in Appendix F. The ranking will be updated periodically as additional dry weather screening and sampling information becomes available.

Section 7: Catchment Investigations

The MS4 Permit requires that the Town perform systematic investigations of each catchment associated with an outfall or interconnection. The Town has developed a catchment investigation plan that will be implemented in a prioritized manner in accordance with the outfall rankings presented in Section 6.6. Progress in implementing the catchment investigations will be documented in the annual reports.

The MS4 Permit's catchment investigation program requires the following:

- Written catchment investigation procedures
- Evaluation of factors that may make a catchment vulnerable to illicit discharges. These factors are referred to as system vulnerability factors.
- For all catchments, dry weather inspection of key junction manholes[1] and follow-up upstream source tracking investigations if the manholes are suspected of having illicit discharges
- For all catchments with one or more system vulnerability factors, additional requirements apply:
  - Dry weather screening of the outfall
  - Wet weather screening of the outfall
- After approximating the location of an illicit source to be between two manholes, perform further investigations to identify and confirm the illicit source
- Removal of all identified illicit sources
- Inclusion of the catchment investigation data in the annual report
- Update the Town's GIS data with infrastructure information collected during inspections
- Update the system vulnerability factors inventory with information collected during inspections

The elements of the catchment investigation program will be discussed in further detail in the following sections.

7.1 Catchment Investigation Written Requirements

The MS4 Permit requires written catchment investigation procedures. These requirements and the documents developed by the Town to comply with these requirements are provided below:

[1] *Manhole junctions* are manhole structures with two or more inlets accepting flow from two or more MS4 alignments (manholes with inlets solely from private storm drains, individual catch basins or both are not considered key junction manholes). *Key manhole junctions* are manhole junctions that are located in such a way that they are representative of illicit discharge conditions in other interconnected manholes in the area. Key manhole junctions should be selected so that there is an adequate number in strategic locations to efficiently identify the presence of illicit discharges without having to investigate each manhole individually.

- **IDDE program support documents** - Identification of maps, historic plans and records, and other sources of data, including but not limited to plans related to the construction of the storm drain and of sanitary sewers, prior work performed on the storm drains or sanitary sewers, Board of Health or other municipal data on septic system failures or required upgrades, and complaint records related to SSOs, sanitary sewer surcharges, and septic system breakouts. These documents are identified in Appendix H.
- **Upstream source tracking procedures** - Development of a manhole inspection methodology that describes a storm drain network investigation that involves systematically and progressively observing, sampling (as required below) and evaluating key junction manholes in the MS4 to determine the approximate location of suspected illicit discharges or SSOs. The Town's upstream source tracking procedures are provided in standard operating procedures contained in Appendix E. These standard operating procedures apply to both dry and wet weather investigations.
- **Procedures to isolate and confirm illicit discharges** – Development of procedures to isolate and confirm illicit discharges. The Town's procedures for isolating illicit discharges are provided in the standard operating procedure contained in Appendix E and in Section 6.4 which documents further investigation procedures used by the Town including CCTV investigations, sandbagging, smoke testing and dye testing.

7.2 Implementation Timeline

The Town will implement the catchment investigations in accordance with the MS4 Permit requirements shown in Table 7-1. The Town has already completed its written catchment investigation procedures and the dry weather screening of all catchments.

Table 7-1. Catchment Investigation Timeline

Description	Permit Requirements	Status
Written catchment investigation procedures	Completion by December 1, 2019	Complete
Investigations of catchments with Problem Outfalls	Commencement by July 1, 2020 Completion by July 1, 2025	Dry weather screening of outfalls complete. Wet weather screening and key junction manhole inspections may be required.
Investigations of catchments with High and Low Priority Outfalls	Commencement by July 1, 2025 Completion by July 1, 2028	Dry weather screening of outfalls complete. Wet weather screening and key junction manhole inspections may be required.

Notes:
The MS4 Permit has an additional requirement that investigations of catchments where any information gathered on the outfall/interconnection screening identifies sewer input shall be completed by July 1, 2025. The Town considers these to be "Problem Outfalls".

7.3 System Vulnerability Factors

The MS4 Permit identifies the following System Vulnerability Factors that may subject a catchment to a higher risk of illicit discharges:

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages.
- Common or twin-invert manholes serving storm and sanitary sewer alignments.
- Common trench construction serving both storm and sanitary sewer alignments.
- Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system.

- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system.
- Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints.
- Areas formerly served by combined sewer systems.
- Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations.

The MS4 Permit also requests that the Town consider the following factors too:

- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs
- Any sanitary sewer and storm drain infrastructure greater than 40 years old
- Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance
- History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)

The Town will develop an inventory of System Vulnerability Factors for each of the catchments. The inventory will be incorporated into this IDDE Plan (Appendix G) and it will be included in the annual report.

7.4 Catchment Investigation Activities

The MS4 Permit requires that the Town inspect key junction manholes during dry weather in all of the subcatchments. The purpose of inspecting key junction manholes instead of all of the manholes is to reduce the number of inspections to a more manageable number while maintaining a high likelihood of finding any illicit discharges that may be present. Some of the catchments do not have junction manholes and are exempt from this requirement. Dry weather screening and sampling at the outfalls will meet the manhole inspection requirement for these catchments.

For catchments that have one or more system vulnerability factors, the permit requires further action:

- Dry weather screening and sampling of outfalls - The outfalls must be screened and sampled in accordance with the procedures in Section 6. The Town has already completed dry weather screening of all of the outfalls, so this requirement has been addressed.
- Wet weather screening and sampling of outfalls - The outfalls must also be screened and sampled during wet weather conditions. The screening and sampling procedures detailed in Section 6 will be followed for wet weather sampling. Wet weather sampling will occur during or after a storm event of sufficient depth or intensity to produce a stormwater discharge at the outfall. There is no specific rainfall amount that will trigger sampling, although minimum storm event intensities that are likely to trigger sanitary sewer interconnections are preferred. To the extent feasible, sampling should occur during the spring (March through June) when groundwater levels are relatively high.

If the outfall screening or sampling indicates a potential illicit discharge, then upstream source tracking will be performed, as warranted, or source isolation and confirmation procedures will be followed as described in Section 6. Once isolated, illicit discharges will also be removed in accordance with the procedures in Section 6.

If outfall sampling and screening does not identify evidence of illicit discharges, and no evidence of an illicit discharge is found during dry weather manhole inspections, the investigations for that catchment will be considered complete.

The information collected during the outfall and manhole inspections will be used to update the Town's GIS data. The system vulnerability factors inventory will also be updated based on inspection data.

The data collected during the catchment investigations will be provided in the annual report.

7.5 Ongoing Screening

Upon completion of all catchment investigations and illicit discharge removal and confirmation (if necessary), each outfall or interconnection will be re-prioritized for screening and scheduled for ongoing screening once every five years. Ongoing screening will consist of dry weather screening and sampling consistent with the procedures described in Section 6 of this plan. Ongoing wet weather screening and sampling will also be conducted at outfalls where wet weather screening was required due to System Vulnerability Factors and will be conducted in accordance with the procedures described in Section 7.4. The results of the investigations will be summarized in the annual report.

Section 8: Training

Annual IDDE training will be made available to all employees involved in the IDDE program. This training will at a minimum include information on how to identify illicit discharges and SSOs and may also include additional training specific to the functions of particular personnel and their function within the framework of the IDDE program. Training records will be maintained in Appendix E. The frequency and type of training will be included in the annual report.

Section 9: Progress Reporting

The progress and success of the IDDE Program will be evaluated on an annual basis. The IDDE Program will be evaluated based on the following indicators:

- Number of SSOs and illicit discharges identified and removed.
- Number and percent of total outfall catchments served by the MS4 evaluated using the catchment investigation procedure.
- Number of dry weather outfall inspections/screenings.
- Number of wet weather outfall inspections/sampling events.
- Number of enforcement notices issued.
- All dry weather and wet weather screening and sampling results.
- Estimate of the volume of sewage removed, as applicable.
- Number of employees trained annually.

These indicators will be quantified each year in the annual report.

Appendix A: Stormwater Management Ordinance and Stormwater Management Regulations

Braintree Town Council

ORDER NO: 18 026 (4) DATE FILED: APRIL 30, 2018

REQUEST OF: THE MAYOR

UPON THE REQUEST OF HIS HONOR, THE MAYOR, THE TOWN OF BRAINTREE, THROUGH THE BRAINTREE TOWN COUNCIL, IT IS SO ORDERED:

That the Town Council vote to amend Title 3 of the Town's General Ordinances, by adding "Chapter 3.13: Stormwater Enterprise Fee", as filed with the Office of the Town Clerk.

YEAS: Bowes, Carey, Hume, Kokoros, O'Brien, Powers, Ringius, Ryan, Whalen

NAYS: NONE

ABSENT: NONE

PASSED IN COUNCIL: May 29, 2018
PRESENTED TO MAYOR: May 30, 2018

A True Record, Attest:

5/31/18
Date Approved

James M. Casey, Town Clerk

Joseph C. Sullivan, Mayor

#18-026

Office of the Mayor

One JFK Memorial Drive
Braintree, Massachusetts 02184

Joseph C. Sullivan
Mayor

781-794-8100

RECEIVED TOWN CLERK
BRAINTREE, MA
2018 MAY -4 PM 4:16

To: Charles B. Ryan, President of the Council
Susan Cimino, Clerk of the Council
James Casey, Town Clerk

From: Joseph C. Sullivan, Mayor JCS

Cc: Joseph Reynolds, Chief of Staff and Director of Operations
Edward Spellman, Director of Municipal Finance
James Arsenault, Public Works Director
Lisa S. Maki, Town Solicitor
John Goldrosen, Asst. Town Solicitor

Date: May 4, 2018

Re: Stormwater Management & Enterprise Ordinances

As I referenced with my FY2019 budget filing on April 30th, Braintree and all communities in our state and throughout the country are being forced via new federal requirements to reduce the amount of polluted stormwater runoff it discharges to waterways. This will require the Town to increase its investment in stormwater infrastructure without any funding by the federal government.

The National Discharge Elimination System (NPDES) program has been in place since 1990 regulating our Town stormwater discharges without much compliance required. Then in 2003 the Environment Protection Agency (EPA) required Municipalities to obtain a permit for stormwater discharges. Now in 2016 the EPA and MassDEP co-signed a new permit that is effective on July 1, 2018. This new permit process requires a five year permit with a ten year outline for work to be performed. This work will include but not be limited to mapping of all the drainage system in the Town, perform outfall screening/ testing, regular routine cleaning of catch basins and roadways, monitoring through a permit process of developments from design to construction to routine operation, impairment mitigation (we are listed on four waterways), establishment of federally required ordinances, lots of outreach and many other activities as well. This will require quite a bit of additional resources for the Town to comply with these upcoming regulations.

In order to be in compliance with this environmental mandate, we are proposing that these stormwater costs be paid for through a Stormwater Utility enterprise fund as a way of absorbing this unfunded federal mandate. This would be accounted for as a line item on the property owners existing water and sewer utility bill. The cost per each residential household up to three units would be $6.25 per quarter or $25 per year for fiscal year 2019/20.

The cost to all other non-residential properties would be the amount of impervious area of the lot divided by the Equivalent Residential Units (ERU) or average impervious area of all of the residential units in Town which is 2,780 square feet. The impervious area is basically the amount of area on a lot that water cannot flow through like a roof, driveway or parking area. This fee is also capped so larger lots are not unduly overburdened.

I take this opportunity to submit this request for the creation of this stormwater utility and management regulation and to provide related information in support of this request. Your consideration and approval is requested.

Accordingly, your review and approval of the following motions are requested:

Stormwater Ordinance Motions

MOTION: That the Town Council vote to amend Title 3 of the Town's General Ordinances, by adding "Chapter 3.13: Stormwater Enterprise Fee", to read as follows:

CHAPTER 3.13. Stormwater Enterprise Fee

3.13.010. Establishment; purpose.

Pursuant to MGL Chapter 83 Section 16, the Town hereby establishes a charge for the use of the stormwater management and flood control services of the Town to be known as the "Stormwater Enterprise Fee" for the purposes of providing revenue for services provided by the Town which are related to:

1. Transfer, control, conveyance and treatment of stormwater runoff through the Town;

2. Maintenance, repair, and replacement of existing stormwater management and flood control systems and facilities;

3. Planning, development, design and construction of additional stormwater management and flood control systems and facilities to meet current and anticipated needs;

4. Regulation of the use of stormwater management services, systems and facilities; and

5. Compliance with applicable local, state and federal stormwater management and flood control regulations, permit requirements and mandates.

3.130.020. Definitions

IMPERVIOUS SURFACE(S): Areas which prevent or impede the infiltration of Stormwater into the soil in the manner in which it entered the soil, in natural conditions, prior to development. Common impervious surfaces include, but are not limited to, rooftops, buildings or structures, sidewalks, walkways, patio areas, driveways, parking lots, storage areas, swimming pools, hockey rinks, decks, compacted gravel and soil surfaces not specifically engineered and maintained to be permeable, awnings and other fabric or plastic coverings, and other surfaces which prevent or impede the natural infiltration of Stormwater runoff which existed prior to development.

MUNICIPAL STORM DRAIN SYSTEM: The system of conveyances designed or used for collecting or conveying Stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, water quality treatment structure natural or man-made or altered drainage channel, reservoir, waterway or other drainage structure that together comprise the storm drainage system owned or operated by the Town.

STORMWATER: runoff from rain, snowmelt, or surface water runoff and drainage.

STORMWATER MANAGEMENT SERVICES: All services provided by the Town which relate to the:

(a) Transfer, control, conveyance or movement of Stormwater runoff through the Town;

(b) Maintenance, repair and replacement of existing Stormwater Management Systems and Facilities;

(c) Planning, development, design and construction of new, expanded or upgraded Stormwater Management Systems and Facilities to meet current and anticipated needs or to reduce the discharge of Stormwater pollutants to wetlands or waterways, ensure that the rate or volume of runoff discharged to wetlands or waterways approximates pre-development hydrology, or prevent or remediate flood damage;

(d) Regulation of the use of stormwater management services, systems and facilities on public or private properties in Braintree; or

(e) Compliance with applicable state and federal stormwater management regulations and permit requirements.

STORMWATER MANAGEMENT AND FLOOD SYSTEMS AND FACILITIES: Natural and manmade channels, swales, ditches, rivers, streams, creeks, branches, reservoirs, ponds, drainage ways, inlets, catch basins, pipes, headwalls, storm sewers, lakes and other physical works, properties and improvements which transfer, control, convey, detain, retain, treat or otherwise influence the movement of Stormwater runoff.

STORMWATER ENTERPRISE FEE: a charge for the use of the Stormwater Management Services of the Town of Braintree.

STORMWATER ENTERPRISE FUND: A specific management structure for the Stormwater Management Fee, in which a municipal utility is established to administer the fee and the Stormwater Management Program for the Town of Braintree similar to a water or sewer utility.

3.130.030. Scope of responsibility for Stormwater management services.

A. The Town shall be responsible for all costs to operate, maintain, improve and access those stormwater management and flood systems and facilities which are located:

1. Within the public road rights-of-way;

2. On private property but within easements granted to, and accepted by the Town, or which are otherwise permitted to be located on such private property by written agreements for rights-of-entry, rights-of-access, rights-of-use or such other lawful means to allow for operation, maintenance, improvement and access to the stormwater management system facilities located thereon;

3. On public land which is owned by the Town and/or land of another governmental entity upon which the Town has agreements providing for the operation, maintenance, improvement and access to the stormwater management and flood control systems and facilities located thereon.

B. Operation, maintenance and/or improvement of stormwater management and flood control systems and facilities which are located on private or public property not owned by the Town, and for which the Town lacks a lawful right of entry, shall be and remain the legal responsibility of the property owner, except as otherwise provided for by state and federal laws and regulations.

3.130.040. Stormwater Enterprise Fees

A. The Stormwater Enterprise Fee is imposed on each parcel of property, including undeveloped and tax-exempt parcels. The fee shall be billed in advance on a quarterly basis to the record title owner of the property. The quarterly bill shall be consolidated in the same bill as is sent to said property owner for other services provided by the Town supported by fees, including water service and sanitary sewer use. If the property does not receive a water/sewer bill from the Town, a bill for only the stormwater services will be sent.

B. Receipts from the Stormwater Enterprise Fee shall be deposited in a special revenue account to be known as the Stormwater Enterprise Fund set up in accordance with the authority granted by MGL Chapter 44 Section 53F1/2. The funds deposited in this account shall be used to fund the stormwater services provided by the Town.

C. The Director of Public Works shall recommend an annual budget for stormwater services to the Mayor. The Mayor shall include a proposed annual budget for the stormwater services in the proposed operating budget submitted to the Town Council. The budget submitted by the Mayor and approved by the Town Council shall set the annual budget at an amount that will be sufficient to provide for a balanced operating and capital improvement budget for the stormwater services provided by the Town.

D. The charge shall be based on Equivalent Residential Unit (ERU) billing units. The annual billing rate for each ERU will be determined by the Director of the Department of Public Works annually.

1. During the first four fiscal years the Stormwater Enterprise Fee will be implemented gradually and the ERU billing rate will be calculated by multiplying an implementation factor by the annual stormwater budget and then dividing by the number of ERUs in the Town, where the implementation factor is 0.42 in year one and increases to 0.75 in year three.

2. Starting in the fifth fiscal year after implementing the Stormwater Enterprise Fee, the billing rate for each ERU will be calculated by dividing the annual stormwater budget by the number of ERUs in the Town.

3. The ERU billing rate shall be on file in the office of the Department of Public Works.

E. The annual charge will be as follows. For residential properties with 1-3 family dwellings, the annual charge shall be 1 ERU billing unit. For all other properties, the number of ERU billing units shall be calculated by dividing the parcel's impervious area by 2,780 square feet and rounding the resulting value to the nearest tenth; however, if the calculated value is less than 1, a value of 1 shall be used instead, or for non-residential property if the value is greater than 116.7, a value of 116.7 shall be used instead

F. Any impervious areas within the federal, state, county and Town-owned right-of-way used by the traveling public will not be attributed to the parcel and will not be considered as part of the total impervious area of the parcel.

3.130.050. Fee billing, delinquencies, collections.

A. Failure of the Town to send a bill for the Stormwater Enterprise Fee shall not relieve the property owner of record from the obligation to pay the Stormwater Enterprise Fee. If a property is unbilled, or if no bill is sent for a particular parcel of land, the Town may back bill for the fees as applicable for a period not to exceed one year of charges, but no late fees or delinquency charges of any kind shall be charged or recovered from any property owner so back billed.

B. The provisions of 13.04.010 pertaining to due dates and interest on unpaid charges shall apply to the Stormwater Enterprise Fee.

C. In accordance with MGL Chapter83, Sections 16A – 16F, the Town may assess liens on properties with unpaid accounts.

D. Pursuant to MGL, Chapter 83, Section 16E, if a property owner believes the Stormwater Enterprise Fee is improperly calculated or is otherwise incorrect, the property owner may, on or before the date when payment is due of the first installment of the annual charge for the Stormwater Enterprise Fee, and after payment of the quarterly charge in full, apply to the Department of Public Works for an abatement. The application for abatement shall be supported by such information as is necessary for a reasonable person to conclude that it is more likely than

not that the billing is in error. The Department of Public Works shall have 90 days to consider the request for abatement and render a written decision, which may deny the abatement, grant the abatement in full or grant the abatement in part. If such application for an abatement is denied in whole or in part, the property owner may appeal to the Appellate Tax Board within 90 days of the date of the Department's decision, upon the same terms and conditions as a person aggrieved by the refusal of the Town assessors to abate a tax.

[*NOTE: Per Section 2-9(c) of the Town Charter, this Amendment to the General Ordinances will require a published notice at least ten days prior to the meeting at which it is approved*]

MOTION: That the Town Council vote to amend Title 13 of the Town's General Ordinances, by adding "Chapter 13.14: Stormwater Management", to read as follows:

CHAPTER 13.14 Stormwater Management

13.14.010. PURPOSE

A. The purpose of this Chapter is to: implement the requirements of the National Pollutant Discharge Elimination System General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems issued by the U.S. Environmental Protection Agency, and the Stormwater Management Standards promulgated by the Massachusetts Department of Environmental Protection; protect the public health, safety, and welfare of Braintree residents; protect the natural resources, water bodies, groundwater resources, environment, and municipal facilities of the Town; satisfy the appropriate water quality requirements of the Federal Clean Water Act and State Clean Water Act; eliminate and prohibit illicit connections and discharges to the Municipal Storm Drain System of the Town; eliminate or reduce the adverse effects of soil erosion and sedimentation as a result of land disturbance activities; and manage stormwater runoff to minimize adverse impacts to the Town, its citizens, and the environment.

B. The Department of Public Works is authorized to administer and enforce this Chapter, and may promulgate rules and regulations to effectuate the purpose of this Chapter.

C. The provisions of this Chapter shall apply to all properties in the Town.

13.14.020. DEFINITIONS

Unless otherwise defined in this section, the terms in this Chapter correspond to definitions found in the Clean Water Act (33 U.S.C. section 1251 et seq.) and the General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems issued by the U.S. Environmental Protection Agency.

The following definitions apply to this Chapter:

Clean Water Act - The Federal Water Pollution Control Act (33 U.S.C. section 1251 et seq.) as it is amended from time to time.

General Permit – The National Pollutant Discharge Elimination System General

Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems issued by the U.S. Environmental Protection Agency.

Illicit Connection - A surface or subsurface drain or conveyance which allows an illicit discharge into a storm drain, including without limitation sewage, process wastewater, or wash water and any connections from indoor drains, sinks, or toilets, regardless of whether said connection was previously constructed, permitted, or approved before the effective date of this Chapter.

Illicit Discharge – The dumping or discharging of any pollutant or non-stormwater discharge into the Municipal Storm Drain System, into a watercourse, or into waters of the United States and /or the Commonwealth, except as exempted in Section 13.14.030.

Land Disturbance – Any activity that removes the surface cover from land, changes the grade, or exposes soil to the potential influence of stormwater.

Massachusetts Stormwater Standards – The performance standards issued by the Massachusetts Department of Environmental Protection (DEP), codified in regulations at 310 CMR 10.05(6)(k)-(q), and further defined and specified in the Massachusetts Stormwater Handbook issued by the DEP.

Municipal Storm Drain System - The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the Town.

Owner – a person who alone or jointly or severally with others has the legal title to any premises or has care, charge or control of any premises as agent, executor, administrator, trust, lessee or guardian of the estate of the holder of legal title.

Person – An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the Commonwealth or the Federal Government, to the extent permitted by law, and any officer, employee, or agent of such person.

State Clean Water Act – Massachusetts General Laws Chapter 21.

Stormwater – stormwater runoff, snow melt runoff, and drainage of any water resulting from rainfall or other precipitation that runs off surfaces during or after a storm.

13.14.030. APPLICABILITY

A. This Chapter applies to all owners that discharge or propose to discharge stormwater off their property, directly or indirectly, into the Municipal Storm Drain System of the Town of Braintree.

B. Prohibited Activities

1. Illicit Discharge – No person shall dump, discharge, cause or allow to be discharged any contaminated water or non-stormwater discharge (except as exempted in Section 13.14.030(C)) into the Municipal Storm Drain System, into a watercourse, or into the waters of the Commonwealth.

2. Illicit Connection – No person shall construct, use, allow, maintain or continue any illicit connection to the Municipal Storm Drain System, regardless of whether the connection was permissible under applicable law, regulation or custom at the time of connection.

C. Exempt Discharges

The following discharges are exempt from this Chapter:

(a) DPW ice and snow control operations;
(b) Flow resulting from firefighting activities;
(c) Street and pavement wash waters;
(d) Natural flow from riparian habitats and wetlands;
(e) Diverted tide, river or streamflows;
(f) Water main, hydrant flushing and other discharges from potable water sources associated with routine maintenance of the water distribution system;
(g) Uncontaminated groundwater or infiltration of groundwater;
(h) Uncontaminated springs;
(i) Rising groundwater;
(j) Uncontaminated water from sump pumps and other pumps that remove floodwaters from basements;
(k) Water discharge from irrigation or watering of lawns, trees, landscaping, and gardens;
(l) Non-commercial car washing;
(m) Waters form residential property management activities including washing walkways, patios, house siding, and windows, provided the wash water does not contain detergents; and
(n) Swimming pool discharges that have been de-chlorinated;

13.14.040. REGULATIONS

A. Regulations adopted by the Department of Public Works pursuant to this Chapter may include but are not limited to the following:

1) Implementation of stormwater runoff pollution reduction requirements for new development and redevelopment consistent with the General Permit, including requirements for stormwater management permits to be issued by the DPW;

2) Limitations on the types of discharges allowed to the Municipal storm Drain System, including exempt activities;

3) Provisions to require the removal of illicit connections;

4) A permitting program to regulate connections to the Municipal storm Drain System;

5) Requirements for the design, construction, and ongoing maintenance of privately-owned stormwater facilities; and,

6) Provisions for inspections, reporting requirements, and enforcement actions necessary to insure compliance with the General Permit, the Massachusetts Stormwater Standards, this Chapter, and the regulations.

B. The regulations may provide for different permitting requirements among projects and facilities, based upon differences in the nature and extent of land disturbance, the effect upon stormwater runoff, and the impacts upon the Municipal Storm Drain System. The regulations may also exempt projects from the requirement for a DPW permit where the projects are otherwise subject to permitting requirements of the Planning Board, the Conservation Commission, or another municipal board, if such requirements are determined by the DPW to ensure compliance with the standards established the DPW permitting requirements.

13.14.050. ENFORCEMENT

A. The DPW shall have authority to enforce this Chapter, its regulations, and permits issued thereunder by violation notices, administrative orders, and civil and criminal court actions pursuant to G.L. c. 83, Section 10, or any other applicable statute or regulation, including actions for injunctive relief and the imposition of civil penalties. The Town may seek to recover from each violator any additional cost for any expense, loss, or damage to the Town occasioned by such violation.

B. To the extent permitted by law, or if authorized by the owner or other person in control of the property, the DPW, its officers, agents, and employees may enter upon privately owned property for the purpose of performing their duties, and may make such inspections and sampling as is reasonably necessary.

C. The decisions and orders of the DPW are final. Any appeal shall be to a court of competent jurisdiction.

D. Any person who violates any provision of this Chapter, the regulations, or a permit issued pursuant to this Chapter or the regulations may be punished by a criminal fine, not to exceed $300, in the manner prescribed by Section 1.08.010 of the Town Ordinances. Each day on which any violation exists shall be deemed a separate violation.

E. As an alternative to criminal prosecution, the DPW may elect to utilize the non-criminal disposition procedure set forth in G.L. c. 40, section 21D and Section 1.08.020 of the Town Ordinances, in which case the Director or the Director's designee, and any Town Police Officer, shall be the enforcing person. The penalty for the first violation shall be $100. The penalty for the second violation shall be $200. The penalty for the third and subsequent

violations shall be $300. Each day on which any violation exists shall be deemed a separate violation.

13.14.060. SEVERABILITY

The provisions of this Chapter are hereby declared to be severable. If any provision, paragraph, sentence, or clause of this Chapter or the application thereof to any owner, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of said Chapter to the extent permitted by law.

[*NOTE: Per Section 2-9(c) of the Town Charter, this Amendment to the General Ordinances will require a published notice at least ten days prior to the meeting at which it is approved*]

Braintree Town Council

ORDER NO: 18 026 (5) DATE FILED: APRIL 30, 2018

REQUEST OF: THE MAYOR

UPON THE REQUEST OF HIS HONOR, THE MAYOR, THE TOWN OF BRAINTREE, THROUGH THE BRAINTREE TOWN COUNCIL, IT IS SO ORDERED:

That the Town Council vote to amend Title 13 of the Town's General Ordinances, by adding "Chapter 13.14: Stormwater Management", as filed with the Office of the Town Clerk.

YEAS: Bowes, Carey, Hume, Kokoros, O'Brien, Powers, Ringius, Ryan, Whalen

NAYS: NONE

ABSENT: NONE

PASSED IN COUNCIL: May 29, 2018
PRESENTED TO MAYOR: May 30, 2018

A True Record, Attest:

5-31-18
Date Approved

James M. Casey, Town Clerk

Joseph C. Sullivan, Mayor

#18-026

Office of the Mayor

One JFK Memorial Drive
Braintree, Massachusetts 02184

Joseph C. Sullivan
Mayor

781-794-8100

RECEIVED TOWN CLERK
BRAINTREE, MA
2018 MAY -4 PM 4:16

To: Charles B. Ryan, President of the Council
Susan Cimino, Clerk of the Council
James Casey, Town Clerk

From: Joseph C. Sullivan, Mayor JCS

Cc: Joseph Reynolds, Chief of Staff and Director of Operations
Edward Spellman, Director of Municipal Finance
James Arsenault, Public Works Director
Lisa S. Maki, Town Solicitor
John Goldrosen, Asst. Town Solicitor

Date: May 4, 2018

Re: Stormwater Management & Enterprise Ordinances

As I referenced with my FY2019 budget filing on April 30th, Braintree and all communities in our state and throughout the country are being forced via new federal requirements to reduce the amount of polluted stormwater runoff it discharges to waterways. This will require the Town to increase its investment in stormwater infrastructure without any funding by the federal government.

The National Discharge Elimination System (NPDES) program has been in place since 1990 regulating our Town stormwater discharges without much compliance required. Then in 2003 the Environment Protection Agency (EPA) required Municipalities to obtain a permit for stormwater discharges. Now in 2016 the EPA and MassDEP co-signed a new permit that is effective on July 1, 2018. This new permit process requires a five year permit with a ten year outline for work to be performed. This work will include but not be limited to mapping of all the drainage system in the Town, perform outfall screening/ testing, regular routine cleaning of catch basins and roadways, monitoring through a permit process of developments from design to construction to routine operation, impairment mitigation (we are listed on four waterways), establishment of federally required ordinances, lots of outreach and many other activities as well. This will require quite a bit of additional resources for the Town to comply with these upcoming regulations.

In order to be in compliance with this environmental mandate, we are proposing that these stormwater costs be paid for through a Stormwater Utility enterprise fund as a way of absorbing this unfunded federal mandate. This would be accounted for as a line item on the property owners existing water and sewer utility bill. The cost per each residential household up to three units would be $6.25 per quarter or $25 per year for fiscal year 2019/20.

The cost to all other non-residential properties would be the amount of impervious area of the lot divided by the Equivalent Residential Units (ERU) or average impervious area of all of the residential units in Town which is 2,780 square feet. The impervious area is basically the amount of area on a lot that water cannot flow through like a roof, driveway or parking area. This fee is also capped so larger lots are not unduly overburdened.

I take this opportunity to submit this request for the creation of this stormwater utility and management regulation and to provide related information in support of this request. Your consideration and approval is requested.

Accordingly, your review and approval of the following motions are requested:

Stormwater Ordinance Motions

MOTION: That the Town Council vote to amend Title 3 of the Town's General Ordinances, by adding "Chapter 3.13: Stormwater Enterprise Fee", to read as follows:

CHAPTER 3.13. Stormwater Enterprise Fee

3.13.010. Establishment; purpose.

Pursuant to MGL Chapter 83 Section 16, the Town hereby establishes a charge for the use of the stormwater management and flood control services of the Town to be known as the "Stormwater Enterprise Fee" for the purposes of providing revenue for services provided by the Town which are related to:

1. Transfer, control, conveyance and treatment of stormwater runoff through the Town;

2. Maintenance, repair, and replacement of existing stormwater management and flood control systems and facilities;

3. Planning, development, design and construction of additional stormwater management and flood control systems and facilities to meet current and anticipated needs;

4. Regulation of the use of stormwater management services, systems and facilities; and

5. Compliance with applicable local, state and federal stormwater management and flood control regulations, permit requirements and mandates.

3.130.020. Definitions

IMPERVIOUS SURFACE(S): Areas which prevent or impede the infiltration of Stormwater into the soil in the manner in which it entered the soil, in natural conditions, prior to development. Common impervious surfaces include, but are not limited to, rooftops, buildings or structures, sidewalks, walkways, patio areas, driveways, parking lots, storage areas, swimming pools, hockey rinks, decks, compacted gravel and soil surfaces not specifically engineered and maintained to be permeable, awnings and other fabric or plastic coverings, and other surfaces which prevent or impede the natural infiltration of Stormwater runoff which existed prior to development.

MUNICIPAL STORM DRAIN SYSTEM: The system of conveyances designed or used for collecting or conveying Stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, water quality treatment structure natural or man-made or altered drainage channel, reservoir, waterway or other drainage structure that together comprise the storm drainage system owned or operated by the Town.

STORMWATER: runoff from rain, snowmelt, or surface water runoff and drainage.

STORMWATER MANAGEMENT SERVICES: All services provided by the Town which relate to the:

(a) Transfer, control, conveyance or movement of Stormwater runoff through the Town;

(b) Maintenance, repair and replacement of existing Stormwater Management Systems and Facilities;

(c) Planning, development, design and construction of new, expanded or upgraded Stormwater Management Systems and Facilities to meet current and anticipated needs or to reduce the discharge of Stormwater pollutants to wetlands or waterways, ensure that the rate or volume of runoff discharged to wetlands or waterways approximates pre-development hydrology, or prevent or remediate flood damage;

(d) Regulation of the use of stormwater management services, systems and facilities on public or private properties in Braintree; or

(e) Compliance with applicable state and federal stormwater management regulations and permit requirements.

STORMWATER MANAGEMENT AND FLOOD SYSTEMS AND FACILITIES: Natural and manmade channels, swales, ditches, rivers, streams, creeks, branches, reservoirs, ponds, drainage ways, inlets, catch basins, pipes, headwalls, storm sewers, lakes and other physical works, properties and improvements which transfer, control, convey, detain, retain, treat or otherwise influence the movement of Stormwater runoff.

STORMWATER ENTERPRISE FEE: a charge for the use of the Stormwater Management Services of the Town of Braintree.

STORMWATER ENTERPRISE FUND: A specific management structure for the Stormwater Management Fee, in which a municipal utility is established to administer the fee and the Stormwater Management Program for the Town of Braintree similar to a water or sewer utility.

3.130.030. Scope of responsibility for Stormwater management services.

A. The Town shall be responsible for all costs to operate, maintain, improve and access those stormwater management and flood systems and facilities which are located:

1. Within the public road rights-of-way;

2. On private property but within easements granted to, and accepted by the Town, or which are otherwise permitted to be located on such private property by written agreements for rights-of-entry, rights-of-access, rights-of-use or such other lawful means to allow for operation, maintenance, improvement and access to the stormwater management system facilities located thereon;

3. On public land which is owned by the Town and/or land of another governmental entity upon which the Town has agreements providing for the operation, maintenance, improvement and access to the stormwater management and flood control systems and facilities located thereon.

B. Operation, maintenance and/or improvement of stormwater management and flood control systems and facilities which are located on private or public property not owned by the Town, and for which the Town lacks a lawful right of entry, shall be and remain the legal responsibility of the property owner, except as otherwise provided for by state and federal laws and regulations.

3.130.040. Stormwater Enterprise Fees

A. The Stormwater Enterprise Fee is imposed on each parcel of property, including undeveloped and tax-exempt parcels. The fee shall be billed in advance on a quarterly basis to the record title owner of the property. The quarterly bill shall be consolidated in the same bill as is sent to said property owner for other services provided by the Town supported by fees, including water service and sanitary sewer use. If the property does not receive a water/sewer bill from the Town, a bill for only the stormwater services will be sent.

B. Receipts from the Stormwater Enterprise Fee shall be deposited in a special revenue account to be known as the Stormwater Enterprise Fund set up in accordance with the authority granted by MGL Chapter 44 Section 53F1/2. The funds deposited in this account shall be used to fund the stormwater services provided by the Town.

C. The Director of Public Works shall recommend an annual budget for stormwater services to the Mayor. The Mayor shall include a proposed annual budget for the stormwater services in the proposed operating budget submitted to the Town Council. The budget submitted by the Mayor and approved by the Town Council shall set the annual budget at an amount that will be sufficient to provide for a balanced operating and capital improvement budget for the stormwater services provided by the Town.

D. The charge shall be based on Equivalent Residential Unit (ERU) billing units. The annual billing rate for each ERU will be determined by the Director of the Department of Public Works annually.

1. During the first four fiscal years the Stormwater Enterprise Fee will be implemented gradually and the ERU billing rate will be calculated by multiplying an implementation factor by the annual stormwater budget and then dividing by the number of ERUs in the Town, where the implementation factor is 0.42 in year one and increases to 0.75 in year three.

2. Starting in the fifth fiscal year after implementing the Stormwater Enterprise Fee, the billing rate for each ERU will be calculated by dividing the annual stormwater budget by the number of ERUs in the Town.

3. The ERU billing rate shall be on file in the office of the Department of Public Works.

E. The annual charge will be as follows. For residential properties with 1-3 family dwellings, the annual charge shall be 1 ERU billing unit. For all other properties, the number of ERU billing units shall be calculated by dividing the parcel's impervious area by 2,780 square feet and rounding the resulting value to the nearest tenth; however, if the calculated value is less than 1, a value of 1 shall be used instead, or for non-residential property if the value is greater than 116.7, a value of 116.7 shall be used instead

F. Any impervious areas within the federal, state, county and Town-owned right-of-way used by the traveling public will not be attributed to the parcel and will not be considered as part of the total impervious area of the parcel.

3.130.050. Fee billing, delinquencies, collections.

A. Failure of the Town to send a bill for the Stormwater Enterprise Fee shall not relieve the property owner of record from the obligation to pay the Stormwater Enterprise Fee. If a property is unbilled, or if no bill is sent for a particular parcel of land, the Town may back bill for the fees as applicable for a period not to exceed one year of charges, but no late fees or delinquency charges of any kind shall be charged or recovered from any property owner so back billed.

B. The provisions of 13.04.010 pertaining to due dates and interest on unpaid charges shall apply to the Stormwater Enterprise Fee.

C. In accordance with MGL Chapter83, Sections 16A – 16F, the Town may assess liens on properties with unpaid accounts.

D. Pursuant to MGL, Chapter 83, Section 16E, if a property owner believes the Stormwater Enterprise Fee is improperly calculated or is otherwise incorrect, the property owner may, on or before the date when payment is due of the first installment of the annual charge for the Stormwater Enterprise Fee, and after payment of the quarterly charge in full, apply to the Department of Public Works for an abatement. The application for abatement shall be supported by such information as is necessary for a reasonable person to conclude that it is more likely than

not that the billing is in error. The Department of Public Works shall have 90 days to consider the request for abatement and render a written decision, which may deny the abatement, grant the abatement in full or grant the abatement in part. If such application for an abatement is denied in whole or in part, the property owner may appeal to the Appellate Tax Board within 90 days of the date of the Department's decision, upon the same terms and conditions as a person aggrieved by the refusal of the Town assessors to abate a tax.

[*NOTE: Per Section 2-9(c) of the Town Charter, this Amendment to the General Ordinances will require a published notice at least ten days prior to the meeting at which it is approved*]

MOTION: That the Town Council vote to amend Title 13 of the Town's General Ordinances, by adding "Chapter 13.14: Stormwater Management", to read as follows:

CHAPTER 13.14 Stormwater Management

13.14.010. PURPOSE

A. The purpose of this Chapter is to: implement the requirements of the National Pollutant Discharge Elimination System General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems issued by the U.S. Environmental Protection Agency, and the Stormwater Management Standards promulgated by the Massachusetts Department of Environmental Protection; protect the public health, safety, and welfare of Braintree residents; protect the natural resources, water bodies, groundwater resources, environment, and municipal facilities of the Town; satisfy the appropriate water quality requirements of the Federal Clean Water Act and State Clean Water Act; eliminate and prohibit illicit connections and discharges to the Municipal Storm Drain System of the Town; eliminate or reduce the adverse effects of soil erosion and sedimentation as a result of land disturbance activities; and manage stormwater runoff to minimize adverse impacts to the Town, its citizens, and the environment.

B. The Department of Public Works is authorized to administer and enforce this Chapter, and may promulgate rules and regulations to effectuate the purpose of this Chapter.

C. The provisions of this Chapter shall apply to all properties in the Town.

13.14.020. DEFINITIONS

Unless otherwise defined in this section, the terms in this Chapter correspond to definitions found in the Clean Water Act (33 U.S.C. section 1251 et seq.) and the General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems issued by the U.S. Environmental Protection Agency.

The following definitions apply to this Chapter:

Clean Water Act - The Federal Water Pollution Control Act (33 U.S.C. section 1251 et seq.) as it is amended from time to time.

General Permit – The National Pollutant Discharge Elimination System General

Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems issued by the U.S. Environmental Protection Agency.

Illicit Connection - A surface or subsurface drain or conveyance which allows an illicit discharge into a storm drain, including without limitation sewage, process wastewater, or wash water and any connections from indoor drains, sinks, or toilets, regardless of whether said connection was previously constructed, permitted, or approved before the effective date of this Chapter.

Illicit Discharge – The dumping or discharging of any pollutant or non-stormwater discharge into the Municipal Storm Drain System, into a watercourse, or into waters of the United States and /or the Commonwealth, except as exempted in Section 13.14.030.

Land Disturbance – Any activity that removes the surface cover from land, changes the grade, or exposes soil to the potential influence of stormwater.

Massachusetts Stormwater Standards – The performance standards issued by the Massachusetts Department of Environmental Protection (DEP), codified in regulations at 310 CMR 10.05(6)(k)-(q), and further defined and specified in the Massachusetts Stormwater Handbook issued by the DEP.

Municipal Storm Drain System - The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the Town.

Owner – a person who alone or jointly or severally with others has the legal title to any premises or has care, charge or control of any premises as agent, executor, administrator, trust, lessee or guardian of the estate of the holder of legal title.

Person – An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the Commonwealth or the Federal Government, to the extent permitted by law, and any officer, employee, or agent of such person.

State Clean Water Act – Massachusetts General Laws Chapter 21.

Stormwater – stormwater runoff, snow melt runoff, and drainage of any water resulting from rainfall or other precipitation that runs off surfaces during or after a storm.

13.14.030. APPLICABILITY

A. This Chapter applies to all owners that discharge or propose to discharge stormwater off their property, directly or indirectly, into the Municipal Storm Drain System of the Town of Braintree.

B. Prohibited Activities

1. Illicit Discharge – No person shall dump, discharge, cause or allow to be discharged any contaminated water or non-stormwater discharge (except as exempted in Section 13.14.030(C)) into the Municipal Storm Drain System, into a watercourse, or into the waters of the Commonwealth.

2. Illicit Connection – No person shall construct, use, allow, maintain or continue any illicit connection to the Municipal Storm Drain System, regardless of whether the connection was permissible under applicable law, regulation or custom at the time of connection.

C. Exempt Discharges

The following discharges are exempt from this Chapter:

(a) DPW ice and snow control operations;
(b) Flow resulting from firefighting activities;
(c) Street and pavement wash waters;
(d) Natural flow from riparian habitats and wetlands;
(e) Diverted tide, river or streamflows;
(f) Water main, hydrant flushing and other discharges from potable water sources associated with routine maintenance of the water distribution system;
(g) Uncontaminated groundwater or infiltration of groundwater;
(h) Uncontaminated springs;
(i) Rising groundwater;
(j) Uncontaminated water from sump pumps and other pumps that remove floodwaters from basements;
(k) Water discharge from irrigation or watering of lawns, trees, landscaping, and gardens;
(l) Non-commercial car washing;
(m) Waters form residential property management activities including washing walkways, patios, house siding, and windows, provided the wash water does not contain detergents; and
(n) Swimming pool discharges that have been de-chlorinated;

13.14.040. REGULATIONS

A. Regulations adopted by the Department of Public Works pursuant to this Chapter may include but are not limited to the following:

1) Implementation of stormwater runoff pollution reduction requirements for new development and redevelopment consistent with the General Permit, including requirements for stormwater management permits to be issued by the DPW;

2) Limitations on the types of discharges allowed to the Municipal storm Drain System, including exempt activities;

3) Provisions to require the removal of illicit connections;

4) A permitting program to regulate connections to the Municipal storm Drain System;

5) Requirements for the design, construction, and ongoing maintenance of privately-owned stormwater facilities; and,

6) Provisions for inspections, reporting requirements, and enforcement actions necessary to insure compliance with the General Permit, the Massachusetts Stormwater Standards, this Chapter, and the regulations.

B. The regulations may provide for different permitting requirements among projects and facilities, based upon differences in the nature and extent of land disturbance, the effect upon stormwater runoff, and the impacts upon the Municipal Storm Drain System. The regulations may also exempt projects from the requirement for a DPW permit where the projects are otherwise subject to permitting requirements of the Planning Board, the Conservation Commission, or another municipal board, if such requirements are determined by the DPW to ensure compliance with the standards established the DPW permitting requirements.

13.14.050. ENFORCEMENT

A. The DPW shall have authority to enforce this Chapter, its regulations, and permits issued thereunder by violation notices, administrative orders, and civil and criminal court actions pursuant to G.L. c. 83, Section 10, or any other applicable statute or regulation, including actions for injunctive relief and the imposition of civil penalties. The Town may seek to recover from each violator any additional cost for any expense, loss, or damage to the Town occasioned by such violation.

B. To the extent permitted by law, or if authorized by the owner or other person in control of the property, the DPW, its officers, agents, and employees may enter upon privately owned property for the purpose of performing their duties, and may make such inspections and sampling as is reasonably necessary.

C. The decisions and orders of the DPW are final. Any appeal shall be to a court of competent jurisdiction.

D. Any person who violates any provision of this Chapter, the regulations, or a permit issued pursuant to this Chapter or the regulations may be punished by a criminal fine, not to exceed $300, in the manner prescribed by Section 1.08.010 of the Town Ordinances. Each day on which any violation exists shall be deemed a separate violation.

E. As an alternative to criminal prosecution, the DPW may elect to utilize the non-criminal disposition procedure set forth in G.L. c. 40, section 21D and Section 1.08.020 of the Town Ordinances, in which case the Director or the Director's designee, and any Town Police Officer, shall be the enforcing person. The penalty for the first violation shall be $100. The penalty for the second violation shall be $200. The penalty for the third and subsequent

violations shall be $300. Each day on which any violation exists shall be deemed a separate violation.

13.14.060. SEVERABILITY

The provisions of this Chapter are hereby declared to be severable. If any provision, paragraph, sentence, or clause of this Chapter or the application thereof to any owner, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of said Chapter to the extent permitted by law.

[*NOTE: Per Section 2-9(c) of the Town Charter, this Amendment to the General Ordinances will require a published notice at least ten days prior to the meeting at which it is approved*]

Braintree Town Council

ORDER NO: 18 026 (6) DATE FILED: APRIL 30, 2018

REQUEST OF: THE MAYOR

UPON THE REQUEST OF HIS HONOR, THE MAYOR, THE TOWN OF BRAINTREE, THROUGH THE BRAINTREE TOWN COUNCIL, IT IS SO ORDERED:

To see if the Town of Braintree will accept the provisions of Chapter 44, § 53F½ of the Massachusetts General Laws establishing a Storm Water fund as an enterprise fund effective fiscal year 2019.

YEAS: Bowes, Carey, Hume, Kokoros, O'Brien, Powers, Ringius, Ryan, Whalen

NAYS: NONE

ABSENT: NONE

PASSED IN COUNCIL: May 29, 2018
PRESENTED TO MAYOR: May 30, 2018

A True Record, Attest:

5/31/18
Date Approved

James M. Casey, Town Clerk

Joseph C. Sullivan, Mayor

Town of Braintree

Stormwater Management Regulations

Department of Public Works
2019

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ARTICLE I
Authority and Purpose

Section 1 - Reference to Regulations. These regulations may be referred to as the Town of Braintree's Stormwater Management Regulations.

Section 2 - Authority. Under the Authority of G.L. c. 83, Section 10 and Title 2, Chapters 2.220 and 13.14. of the Town's Ordinances, the Braintree Department of Public Works has established the following regulations governing Stormwater Management Facilities in the Town of Braintree.

Section 3 - Effect on other Town Ordinances. With respect to Stormwater Management Facilities, these Regulations supplement Section X Design Standards – Storm Drainage of the Town of Braintree's Subdivision Rules and Regulations.

Section 4 - Purpose. These Regulations are intended to protect, maintain and enhance the public health, safety and welfare and the environment by establishing minimum requirements and procedures to control the adverse effects of increased post-development stormwater runoff, decreased groundwater recharge and non-point source pollution associated with new development and re-development, to ensure proper and safe operation of the Town's Stormwater Management Facilities and to implement the requirements of the National Pollutant Discharge Elimination System General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems issued by the U.S. EPA by regulating land disturbance activities that may result in soil erosion and sedimentation and stormwater runoff directed to the Town's stormwater management system or the waters of the United States and/or Commonwealth of Massachusetts.

Section 5 - Severability. The provisions of these Regulations are severable. If any provision of these Regulations or any specific application to any person or circumstance is held invalid, such invalidity shall not affect the other provisions or application of said Regulations to the extent permitted by law.

Section 6 - Applicability These Stormwater Management Regulations shall apply to all activities in accordance with Chapter 13.14 of the Town of Braintree General Ordinances.

Section 7 - Right to Amend Regulations. The Department of Public Works reserves the right to amend these Regulations in any manner and to establish more stringent limitations or requirements as are deemed necessary or appropriate.

Section 8 - Required Applications and Permits.

(a) Applications and permits required in Article V. of these Regulations are in addition to applications and permits that may be required by other federal, state and local laws or regulations. Stormwater Management Permits are required by these Regulations and issued by the Stormwater Division of the Department of Public Works as they apply:
   i. Building/Drain Connection Permit
   ii. Stormwater Management Permit - Minor Project

iii. Stormwater Management Permit - Major Project

(b) These Regulations shall not be construed to require the Town to permit itself or those in its employ for activities done to carry out the Town's responsibilities under any federal or state laws, regulations, or requirements.

Section 9 - Stormwater Enterprise Fee. Pursuant to Title 13 Chapter 13.14 of the Town of Braintree General Ordinances, the Town has established a Stormwater Enterprise Fee for the purposes of funding the Town's stormwater management facilities and services.

Section 10 - The Department of Public Works shall enforce, pursuant to Article VII. of these Regulations and other applicable local, state, and federal laws, these regulations and the terms and conditions of a permit issued under these Regulations.

ARTICLE II
Use of Municipal Stormwater Management System

Section 1 - Municipal Stormwater Management Facilities/MS4 (Municipal Separate Storm Sewer System). The use of all MS4 Facilities in the Town shall be controlled by the Department. No person shall uncover, excavate over, block access to, or make any connection with or opening into, use, alter, or disturb any municipal stormwater management facility or appurtenance thereof within the Town's stormwater management system, without a permit issued by the Department.

No person shall maliciously, willfully or negligently break, damage, destroy, uncover, deface or tamper with any structure, appurtenance, or equipment which is part of the Town's MS4 system. Any person violating this provision shall be subject to immediate arrest under charge of disorderly conduct.

Section 2 - Permit Required. No person shall make any connection to the Town's MS4 system without first obtaining a Stormwater Management Permit from the Department pursuant to Article V.

Section 3 - Private Stormwater Management Facilities.

(a) All private Stormwater Management Facilities that connect directly or indirectly to the Town's MS4 system shall be controlled as to discharge by the Department, but constructed, installed, maintained, repaired, and operated by their owners, at the owner's expense. All private Stormwater Management Facilities that connect to the Town's MS4 system shall be constructed, installed, maintained, repaired, and operated to the satisfaction of the Department.

(b) Repairs to private Stormwater Management Facilities in the Town, including repairs required to comply with these Regulations, shall be made by a contractor on the Water and Sewer Division's approved list.

Section 4 - Ownership and Maintenance of Private Stormwater Management Facilities.

(a) Private Stormwater Management Facilities, whether located on public or private property, are owned by the owner of the premises served. In the case where more than one premise is connected to the same building storm drain, the owners of the respective premises shall be jointly and severally responsible for the maintenance and repair of the building storm drain.

(b) The owner of a Private storm drain shall at all times keep such drains clean and in good repair in order not to cause depletion of groundwater, damage to property, odor, or harm to the Town's Stormwater Management Facilities.

(c) The owner shall maintain, repair, modify or replace an existing Private storm drain whenever it is determined by the Department that such drains may endanger public health, create a public nuisance, result in public or private property damage, or impair water quality or the environment and in such other circumstances as the Department deems appropriate.

(d) The owner shall develop mechanisms and procedures designed to prevent spills whenever the Department determines that it is necessary. This includes identification of spills, reporting and containment procedures, documentation and training.

ARTICLE III
General Requirements

A. PROHIBITED ACTIVITIES

Section 1 - Illicit discharge. No person shall dump, discharge, cause or allow to be discharged any contaminated water or non-stormwater discharge (except as exempted in B. § 1 below) into the MS4 system, into a watercourse, or into the waters of the Commonwealth.

Section 2 - Illicit connection. No person shall construct, use, allow, maintain or continue an illicit connection to the municipal storm drain system, regardless of whether the connection was permissible under applicable law, regulation or custom at the time of connection.

Section 3 - Roof Leader connections. No person shall connect building roof leaders directly to the municipal storm drain system.

B. AUTHORIZED DISCHARGES

Section 1 - Authorized Discharges to MS4 Facilities.

Discharges to MS4 Facilities which are authorized by these regulations are as follows:

(a) Unless otherwise determined by the Department, discharges composed entirely of stormwater that were connected prior to the enactment of these regulations.

(b) Discharges composed entirely of stormwater that are free from sediments related to erosion from construction sites.

(c) Discharges for which the owner has obtained a Stormwater Management Permit from the Department, are in compliance with any requirements contained in the Town's Stormwater Management Plan, and if appropriate, an Industrial Activity Permit, Construction Activity Permit, or a NPDES Permit Exclusion from EPA.

(d) Discharges from the following sources:

(i) Department of Public Works ice and snow control operations;

(ii) Flow resulting from firefighting activities;

(iii) Street and pavement wash waters;

(iv) Natural flow from riparian habitats and wetlands;

(v) Diverted tide, river or stream flows;

(vi) Water main, hydrant flushing and other discharges from potable water sources associated with routine maintenance of the water distribution system;

(vii) Uncontaminated groundwater or infiltration of groundwater;

(viii) Uncontaminated springs;

(ix) Rising groundwater;

(x) Uncontaminated water from sump pumps and other pumps that remove floodwaters from basements;

(xi) Water discharge from irrigation or watering of lawns, trees, landscaping and gardens;

(xii) Noncommercial car washing;

(xiii) Waters from residential property management activities, including washing walkways, patios, house siding and windows, provided the wash water does not contain detergents and

(xiv) Swimming pool discharges that have been de-chlorinated.

C. REQUIREMENTS FOR ALL STORMWATER DISCHARGES

Section 1 - Notification of Changed Discharge. Every property owner who directly or indirectly discharges stormwater to the Town's stormwater management system shall notify the Department in writing in advance of:

(a) Any substantial change in the rate and/or volume of discharge; and

(b) Any change in the location of the discharge to a different storm drain connection.

(c) Any change in the total amount of impervious cover of areas connected to the storm drain.

Existing discharges authorized in Article III.B. may be required to obtain a Stormwater Management Permit as a result of the above changes.

Section 2 - Notification of Violations.

(a) Property owners shall notify the Department by telephone or email immediately upon discharging stormwater in violation of these Regulations or their permits and of any upset, or spill that may reasonably be expected to discharge to the storm drainage system.

(b) Each notification shall be followed within 10 business days of the date of occurrence by a detailed written statement addressed to the Department describing the causes of the discharge and the measures being taken to prevent a recurrence. Such notification will not relieve property owners of liability for any expense, loss or damage to the Town stormwater management system or for any fines imposed on the Town due to such discharge.

Section 3 - Preventive Measures. Each property owner shall provide reasonable and appropriate protection from any discharge, including accidental discharges, in violation of these Regulations.

Section 4 - NPDES Notice of Intent and Permit. Every person who is required to be covered under an Industrial Activity Permit shall submit to the Department a copy of the completed Notice of Intent or individual application as submitted to EPA, and the information identified in items (a) through (h) below, as applicable.

(a) Address of the building (or premises) where the discharge will take place and the name and address of the building (or premises) owner;

(b) Name of a contact person, title and phone number;

(c) A site plan or sketch which shows the location of the connection of the building storm drain or the point(s) of discharge to the Town's storm drainage system, including the street name, and the size of the storm drain to which the stormwater will discharge;

(d) Standard Industrial Code (SIC Code) of the facility;

(e) A description of the product or services provided by the facility;

(f) A description of the nature of the discharge;

(g) Existing NPDES permit number, if any;

(h) Facility's Assessor's Map and Parcel Number.

Section 5 - Compliance with Treatment Standards. Every property owner, if so directed by the Department, must implement structural and non-structural stormwater BMPs that are consistent with the Town's Stormwater Plan. BMPs must be selected and designed using the appropriate criteria from the most recent Massachusetts Stormwater Handbook, as amended.

ARTICLE IV
Private Storm Drains and Stormwater Runoff Facilities, Connections and Appurtenances

Section 1 - Separate Building Sewers and Building Storm Drains. Separate and independent building sewers and building storm drains shall be provided for all new or substantially rehabilitated buildings.

Section 2 - Gravity Discharge to Storm Drains. No building storm drains shall discharge by gravity to the Town storm drains. In all buildings in which the building storm drain is lower than the street grade in front of the building, stormwater shall be lifted by an approved means to a manhole or catch basin in the Town storm drain system.

Section 3 - Connections to Manholes. Private storm drain connections for new or substantially rehabilitated buildings shall be made directly to Town-owned manholes or catch basins unless otherwise approved by the Department.

Section 4 - Wastewater-Stormwater Separation.

(a) The plumbing of any existing or new building shall be so constructed as to keep all stormwater, surface water, groundwater, roof and surface runoff, subsurface drainage, uncontaminated cooling water, and uncontaminated industrial process water, non-contact cooling water, and non-contact industrial process water separate from sanitary sewage and industrial wastes, and from the building sewer.

(b) The building drain conveying wastewater from plumbing fixtures within the building shall discharge to a building sewer, while the building drain conveying stormwater and other drainage listed in (a) shall discharge to a building storm drain.

(c) In accordance with Town Ordinances, on-site disposal of stormwater is required to the extent feasible. Where separate storm drains and sanitary sewers are provided, and site conditions do not permit on-site disposal of the required amount of stormwater, the

Town will allow treated stormwater or a treated overflow from the on-site system which shall be connected to a storm drain. Connection of a private storm drain to a sanitary sewer is prohibited.

(d) Connection of a building sewer to a storm drain is prohibited.

(e) The Department shall require an owner to eliminate a discharge to the storm drain whenever the Director determines that the discharge violates the provisions of Article III.

Section 5 - Cleanouts. Where a new building is to be constructed which is set back from the property line, the Department may require the owner to install a clean-out on the owner's property at every 100 linear feet of pipe length and at every 22 1/2° or greater change in direction.

Section 6 - Floor Drains. Floor drains shall be connected to the building sewer.

ARTICLE V
Permit Procedures and Requirements

All permits issued by the Department pursuant to Ch. 13.14 will be referred to as "Stormwater Management Permits".

Section 1 - General

(a) Timing of Application. A Stormwater Management Permit ("Permit") must be obtained prior to the commencement of any activity for which a Permit is required under Ch. 13.14 Stormwater Management or these regulations.

(b) Owner Responsibility. While application may be made by a representative, the permittee must be the Owner of the property. If the applicant has less than a fee interest in all parcels on which work will occur, the applicant shall provide written consent from the fee owner of each affected parcel, or evidence of an interest in the parcels sufficient to establish the applicant's right to conduct the work. It is the property Owner or agent's responsibility to determine if other Town, state or federal permits or applications are required and to secure them.

(c) Burden of Proof. It is the applicant's responsibility to be aware of and meet the requirements of the Stormwater Management Ordinance and the Regulations. The applicant has the burden of proving that the proposed project or activity will comply with the Ordinance and the Regulations.

(d) With the exception of discharges authorized under Article III. B, no person shall cause or allow any new stormwater discharges to the Town's storm drainage system without having first obtained all necessary approvals from the Planning Board and Conservation Commission and a Stormwater Management Permit from the Department. The decision

to issue a Stormwater Management Permit rests entirely with the Department. Such discharges shall comply with all other applicable federal, state and local requirements.

(e) The Stormwater Management Permit issued to an applicant may stipulate Special Conditions and terms as deemed necessary or appropriate by the Department. These may include start and completion dates.

(f) The Department may deny a permit for any discharge which it believes can reasonably be expected to result in significant harm to public health, safety, the environment, to the Town's MS4 system or a tributary to the Town's storm drainage system.

(g) An applicant may request reconsideration of the terms and conditions in an issuance, renewal, or modification of a permit issued by the Town, and an applicant may request reconsideration of the denial of a permit by the Town.

(h) A Stormwater Management Permit may be revoked, suspended or reissued with additional Special Conditions if the Department determines that the discharge, whether singly or in combination with others, is contributing to a water quality problem, is causing violation of the Town's MS4 Permit or has not been executed in compliance with the conditions of the Permit.

(i) All Stormwater Management Permit applications shall include the appropriate fee as provided in Article VIII.

Section 2 – Pre-Application Meeting

Applicants are strongly encouraged to schedule a pre-application meeting with the Department at the earliest feasible time for the following purposes:

(a) Discussion of the proposed development plans and requirements for a Permit and the anticipated fees.

(b) Advise the engineer and/or applicant of the Town’s design standards (see Appendices), goals with respect to stormwater management at the site, and to the extent practicable, of any known concerns or issues regarding stormwater management at the site.

(c) Advise the engineer and/or applicant of application submission requirements or of additional information needed as part of the application at the time of filing.

(d) Encourage the use of Low Impact Development (LID) Best Management Practices and Green Infrastructure in the proposed stormwater management design. Unlike conventional development and stormwater controls, an LID approach to design begins with an assessment of environmental and hydrologic conditions at the site and how best to address these conditions. Green Infrastructure includes water treatment systems that use vegetation, soils, and other nature-based elements to filter and treat polluted

stormwater runoff before it is discharged into a local water body. Applicants are reminded that the objectives of the LID approach are to:

1. Develop a site plan that reflects natural hydrology

2. Minimize impervious surfaces

3. Treat stormwater in numerous small, decentralized structures

4. Use natural topography for drainage ways and storage areas

5. Preserve portions of the site in undisturbed, natural conditions

6. Lengthen travel paths to increase time of concentration and attenuate peak rates

Section 3 - Application Procedure

(a) Building/Drain Connection Applications

1. Any new connection to the Town's MS4 storm drain system involving sump pump or groundwater discharge shall require approval from the Department.

(b) Minor Applications which involve either:

1. Land Disturbance of more than 2,500 square feet but less than 5,000 square feet and less than 150 cubic yards of imported of exported material, or

2. Land disturbance greater than 5,000 square feet but less than 1 acre or greater than 150 cubic yards of imported or exported material with Site Plan Approval or a Grading Permit from the Planning Board.

3. Any proposed connection to the MS4 system

Minor Permit Requirements

At least 30 days prior to initiating any work the applicant shall submit two copies of the completed Stormwater Management Permit – Minor Project application form along with the following:

1. Copy of Site Plan Approval or a Grading Permit from the Planning Board (if required)

2. A sketch plan illustrating:

   a. Existing features of the site including structures, pavement and landscaped areas

b. Proposed areas of land disturbance, stormwater management measures for new impervious areas and limit of work boundary

c. Erosion control measures to prevent sediment from entering the MS4 system

d. Details of an on-going maintenance program for the stormwater management measures with the name and contact information of the person responsible

(c) Major Permits

Major projects are those which involve either:

a. Land disturbance greater than 5,000 square feet but less than 1 acre not requiring Site Plan Approval from the Planning Board or

b. Land Disturbance greater than one acre, or

c. Existing or new connections required to implement structural and non-structural BMPs to be consistent with the Town's Stormwater Plan.

d. Extensions or relocations of a Town storm drain

At least 60 days prior to initiating any work the applicant shall submit two hard copies and one digital copy of the completed Stormwater Management Permit – Major Project application form along with the following:

a. Copies of any approvals received from the Conservation Commission.

b. Project Narrative describing existing conditions, proposed development and methods used to mitigate stormwater impacts as well as an evaluation and implementation of Low Impact Development Best Management Practices

c. Stormwater Management Plan in accordance with Appendix B that includes:

1. Existing Conditions Plan with property line information, existing topography (2 foot contour interval), existing utilities, drainage, tree line, wetland boundaries, stamped and signed by a MA registered Professional Land Surveyor

2. Site Plan with site layout, proposed grading (2 foot contour interval) proposed utilities, proposed clearing, stormwater management measures, soil testing data and limit of work line, signed and stamped by a MA registered Professional Engineer

d. Erosion and Sedimentation Control Plan in accordance with Appendix C

e. Construction Sequence

f. Stormwater Report that includes

1. Completed Mass DEP Stormwater Checklist signed and stamped by a MA registered Professional Engineer

2. Pre and Post-development hydrologic calculations in accordance with Article VI of these Regulations

3. Operations and Maintenance Plan in accordance with Appendix D

Section 4 – Peer Reviews

In accordance with MGL Ch. 44 § 53G, the Department may impose reasonable fees for the employment of outside consultants to assist the Department in its review of permit applications and may deposit such fees in a special account. Any such account shall be established by the Town Treasurer in the Town treasury and shall be kept separate and apart from other monies. The special account, including accrued interest, if any, shall be expended at the direction of the Department without further appropriation; provided, however, that such funds are to be expended by it only in connection with carrying out its responsibilities under the Ordinance and these regulations to review the particular permit application. Any excess amount in the account shall be repaid to the applicant or to the applicant's successor in interest at the conclusion of the application review. The applicant may appeal the selection of the consultant to the Town Council, but solely on grounds that the consultant has a conflict of interest or lacks necessary qualifications to undertake the review. The Department's determination that consultant review is necessary is not subject to appeal.

Section 5 – Inspections

Minor Permit

Inspections shall be conducted by the Department or its agent at the following stages

(a) After the erosion control measures have been installed

(b) During the installation of stormwater management measures as required by the conditions of the permit

(c) After the work has been completed and the site is stabilized

Major Permit

(a) Pre-construction Meeting

Prior to the commencement of land disturbance, clearing, excavation, or construction, the applicant, the applicant's technical representative, the general contractor and any other person with authority to make changes to the project, shall meet with the Stormwater Manager to review the permitted plans and their implementation. A copy of the Stormwater Management Permit and approved plans shall be kept on the project site during the progress of the work. A copy of the NPDES Construction General Permit and Stormwater Pollution Prevention Plan (for projects greater than 1 acre) shall be kept at the site as well. This meeting may be combined with pre-construction meetings required by other town Boards and officials.

(b) Inspections

The Department or its agent shall perform. inspections as listed below, and shall either approve that portion of the work completed or shall notify the permittee of any noncompliance with Permit requirements. In order to obtain inspections, the permittee shall notify the Department at least two business days prior to the requested inspection. Inspections shall occur at the following stages:

1) Erosion and sediment control measures are in place and stabilized
2) Site clearing has been substantially completed
3) Stormwater Management System
   i) Rough grading has been substantially completed
   ii) Subsurface Infiltration Systems
   iii) Excavation of area for system
   iv) Placement of stone below system and installation of filter fabric
   v) Backfilling and installation of inspection port(s)
   vi) Final grading has been substantially completed
   vii) Final Landscaping (permanent stabilization) and project final completion

(c) Final Inspection and "As-built" Plans

1) Within one year of the completion of the project, after the stormwater management system has been constructed, the permittee shall submit an "as-built" plan for any stormwater management facilities or practices to the Department. This plan shall be accompanied by an Engineer's Certification, stamped and signed by a Professional Engineer registered in the Commonwealth of Massachusetts, stating that the stormwater management system has been inspected during a storm event, is functional as designed and that the completed project complies with all aspects of the Permit. Any discrepancies between the approved plan and the "as-built" plan must be described in the Engineer's Certification.

2) "As-built" plans shall be full-sized plans which reflect the "as-built" conditions, including all final grades and pipe inverts. All work deleted, correction in elevations and changes in materials shall be shown on the "as-built" plan.

3) If the stormwater system is found to be inadequate by virtue of physical evidence of operational failure, even though it was built as called for in the approved plans, the deficiencies shall be addressed and corrected by the permittee before any performance guarantee is released and a Certificate of Completion is issued.

Section 6– Certificate of Completion

Prior to the request for Certificate of Completion, the permittee shall provide to the Department for its review and written approval, a revised Operations and Maintenance Plan of all "as-built" structural BMP systems, as well as anticipated non-structural BMPs, such as sweeping, and applications of winter de-icing agents. The O&M plan, at a scale of 1" = 20', or as approved of in advance by the Department, shall include a depiction of each structural BMP element. The O&M Plan shall also indicate those areas within which applications of fertilizers, herbicides and pesticides are anticipated, and those areas to be designated as chemical and/or fertilizer free. Materials, application rates and total amounts to be used of each material shall be provided. The permittee shall also provide some documentation to the Department of adequate funding for required maintenance.

Section 7– Continuing Conditions

(a) Adherence to the provisions of the approved O&M Plan is a continuing requirement of the Permit. Failure to adhere to these provisions will constitute a violation of the Stormwater Management Ordinance and these Regulations, and be subject to enforcement action.

(b) A request to modify the requirements of the O&M Plan shall be submitted to the Department, which may approve the requested modification if it is determined to be an insignificant change. If the Department determines that the requested modification is significant, it may require that the permittee submit a request to amend the Permit, which shall be subject to the formal review procedures set forth in these Regulations.

(c) The licensed contractor responsible for the operation and maintenance of a stormwater facility shall make and keep a record of all operation and maintenance activities showing compliance with the O&M Plan and shall submit a detailed annual report to the Department no later than January 31 each year.

ARTICLE VI
Post-Development Stormwater Management Criteria

At a minimum, all projects subject to a Major Stormwater Management Permit shall comply with the criteria, specifications and performance standards of the most recent version of the Massachusetts Stormwater Management Standards and accompanying Stormwater Management Handbook, as well as the criteria contained herein. The following general performance criteria shall be applicable to all stormwater management plans, unless otherwise provided for in these Regulations

Section 1 – Low Impact Design and Green Infrastructure

(a) The design of the project shall, to the maximum extent feasible, employ environmentally sensitive site design as outlined in the Mass. DEP Stormwater Handbook, as amended, and shall attempt to reproduce natural hydrologic conditions with respect to ground and surface waters.

(b) Evaluation of Low Impact Development practices is required and implementation of such practices to the maximum extent practicable is encouraged. If the proposed stormwater management system design does not fully utilize Low Impact Development techniques, the applicant shall provide written documentation of which Low Impact Development Best Management Practices were evaluated for the proposed project and the reasons such practices were found to be infeasible. Guidance on these practices is provided in the 2008 Mass DEP Stormwater Management Handbook.

(c) In order to conserve potable water supplies and maximize recharge, it may be appropriate on some sites to store clean runoff (e.g. from roofs) for reuse on the site for irrigation or other gray water purposes. This can be accomplished, through the use of cisterns and rain barrels. Where appropriate, a water budget may be required to be prepared to determine applicability.

Section 2 – Hydrologic and Hydraulic Criteria

(a) Hydrologic analyses using TR-55/TR-20 methodology shall be performed on the entire project site and include any off-site areas that drain to or through the project site.
(b) The analyses shall be performed for the 2, 10, 25 and 100-year design storms under pre-development and post-development conditions. The specified design storms shall be defined as a 24-hour storm using the most recent rainfall distribution recommended by the National Oceanic and Atmospheric Administration Atlas 14, as amended.
(c) The post-development peak discharge rate shall be equal to or less than the pre-development peak discharge rate, based on 2-year, 10-year, 25-year and 100-year 24-hour storms.
(d) Hydrologic analyses are to be performed in a pre and post sub-watershed basis with designated control points at each location where runoff leaves the site or enters a water body.

(e) The same land area shall be used in the analysis to facilitate comparison of existing and proposed conditions.
(f) The total volume of discharge, as well as peak rate, shall be evaluated at each control point.
(g) The site shall be designed to ensure that all runoff from the site up to the 100-year storm enters the control structure. For example, the drainage system may only be sized to handle a 25-year storm, with larger storms flooding the distribution system and traveling overland. This overland flow, or overflow, must be directed into the peak control structure or otherwise managed to attenuate flow.
(h) For purposed of computing runoff, all pervious lands on the site shall be assumed, prior to development, to be in "good" condition regardless of conditions existing at the time of computation.
(i) Off-site areas should be modeled as their present land use condition in good hydrologic condition.
(j) The length of overland sheet flow used in time of concentration (TC) calculations shall be limited to nor more than 50 feet for pre and post development conditions.
(k) Stormwater Management Systems shall be designed to retain and/or treat the first one inch (1″) of runoff from all impervious surfaces on the site. The portion of the first one inch (1″) which cannot be feasibly retained and/or infiltrated shall be treated using treatment methods consistent with the Final Total Maximum Daily Loads for affected receiving waters and any additional treatment requirements in the Town of Braintree's MS4 Permit. Pre-treatment of runoff from paved surfaces is required to remove 44% of the Total Suspended Solids prior to infiltration. Driveways associated with applications for single-family dwellings are exempt from this requirement as per the 2008 Mass DEP Stormwater Handbook, but to the extent practicable, runoff from such driveways shall be directed to adjacent pervious surfaces.
(l) Stormwater outlets shall be designed to prevent erosion.
(m) For other structural stormwater controls not included in the Mass DEP Stormwater Handbook, or for which pollutant removal rates have not been provided, the effectiveness and pollutant removal of the structural control must be documents through third party studies and receive approval from the Department before being included in the design of a stormwater management system.

Section 3 – Segmentation

Proposed residential, commercial or industrial subdivisions shall apply these stormwater management criteria to the land development as a whole. Individual lots in new subdivision shall not be considered separate land development projects, but rather the entire subdivision shall be considered a single land development project. Hydrologic parameters shall reflect the ultimate land development and shall be used in all engineering calculations.

Section 4 – Sensitive Areas

Stormwater discharges to critical areas with sensitive resources (i.e. shellfish beds, swimming beaches, aquifer recharge areas, water supply reservoirs, Areas of Critical Environmental Concern) may be subject to additional criteria, or may need to utilize or restrict certain stormwater management practices at the discretion of the Department.

ARTICLE VII
Enforcement

The Department or an authorized agent of the Department shall enforce these Regulations and may pursue all civil, criminal, and non-criminal remedies for violations of said Regulations.

A. INSPECTIONS

Section 1 - Right of Access.

(a) To the extent permitted by law or with the consent of the property owner, duly authorized representatives of the Town may inspect the property or facilities of any property owner (including facilities under construction) to ascertain compliance with these Regulations or compliance with any permit issued pursuant to these Regulations.

(b) Owners or occupants of premises where stormwater is either generated or discharged shall allow properly identified Town representatives safe and ready access, at all reasonable times during normal business hours and at such other times as the Town reasonably suspects that a violation of these Regulations or a permit issued pursuant to these Regulations may be occurring. Access shall be allowed to all such parts of the premises as would enable Town personnel to inspect, observe, measure, sample and test all such other facilities as the Town reasonably believes may be contributing to a violation of these Regulations or a permit issued pursuant to these Regulations.

(c) The Town may conduct routine, periodic inspections of facilities such as building storm drains, catch basins, treatment systems, pre-treatment facilities or other stormwater components. Owners or occupants shall provide any labor or equipment needed by Town personnel to open, inspect, and operate such facilities.

B. MONETARY LIABILITY

Section 1 - Penalties.

Any person who violates any provision of these Regulations or a permit issued pursuant to these Regulations shall forfeit and pay to the Town an amount set forth in Chapter 13.14.0501 of the Town's Ordinances. For purposes of this section, each day of a continuous violation shall be deemed to be a separate violation. If a violation is intermittent, each occurrence shall be deemed to be a separate violation.

Section 2 - Reimbursement for Costs to the Town.

Failure to comply with any portion of these Regulations, or with any permit or order issued thereunder, shall be sufficient cause for the Town to levy on and collect from each violator any additional cost for any expense, loss, or damage occasioned by such violation, including assessments or penalties levied or imposed on the Town by any state or federal agency.

C. ENFORCEMENT ACTIONS

Section 1 - Multiple Alternatives. When the Department determines that a person has a violation the Town may take any one or more of the following actions, in any sequence or simultaneously:

(i) The Town may issue a request or an order to cease and desist any such violation or any actions that cause or threaten to cause a violation, and/or an implementation schedule for undertaking specific actions or practices.

(ii) The Town may require the person to obtain a storm drain connection permit.

(iii) The Town may require the person in question to submit a detailed time schedule setting forth specific actions to be taken and specific dates upon which such actions will be undertaken in order to prevent or correct a violation. The Town may issue an implementation schedule containing or modifying such specific actions and time schedule, or requiring such other actions within such times as the Town deems appropriate.

(iv) The Town may issue an order directing the person to pay to the Department penalties and costs in accordance with Section C.

(v) The Town may revoke, modify, deny, suspend, or refuse to renew a permit issued to the person under these Regulations.

(vi) The Town may take direct enforcement action by filing suit in any court of competent jurisdiction for civil or criminal fines and reimbursement of costs or damages resulting from the violation or threatened violation and/or injunctive relief.

(vii) The Town may take any other action available to it under any applicable statute or regulation.

ARTICLE VIII
Permit Fees
STORMWATER PERMIT FEE SCHEDULE

Section 1 – Each Stormwater Management Permit application must include the required filing fee.

a) Application Fee

(1) An Application Fee is payable at the time of application. It is non-refundable.

(2) The purpose of the Application Fee is to offset the Department's costs incurred by the Town in reviewing, approving and monitoring the permit and compliance therewith.

(3) The Application Fee is in addition to any other local or state fees that may be charged under any other law or ordinance.

(4) The Application Fee shall be paid according to the following schedule:

Activity	Application Fee
Existing Building/Drain Connection	No charge
Land Disturbance more than 2,500 SF but less than 6,000 SF	$100.00
New or Re-developed Single/Two Family House	$250.00
Residential Development other than SF House	
Residential Subdivision	
2 – 3 Lots	$300.00
4 – 10 Lots	$1,000.00
11 or more Lots	$1,500.00
Multi-Family Structures (townhouses, condominiums, apartments larger than 2 units per building)	
3 – 10 Units	$700.00
11 – 23 Units	$900.00
24 – 40 Units	$2,000.00
41 or more Units	$2,750.00
Commercial and Industrial Projects	
Disturbance of 2,500 SF to 5,000	$400.00
Disturbance of 5,001SF to 21,779 (1/2 AC)	$500.00
Disturbance of 21,780 SF (1/2 AC) – 1 AC	$600.00
Disturbance of 1.1 to 2 AC	$700.00
Disturbance of 2.1 to 10 AC	$1,000.00
Disturbance of more than 10 AC	$1,500.00

Request for Certificate of Completion

Single or Two Family House	$100.00
All others	$200.00

b) Review Fee

(1) A Review Fee may be charged to cover outside professional consultant review services for a project if the Department, after consultation with the Town Engineer, determines that such services are necessary due to the scope and complexity of the project. The consultant services may include, but are not limited to review by engineers, hydrologists, attorneys, or other professionals for hydrologic and drainage analysis, stormwater quality analysis, site inspections, as-built plan review , and analysis of legal issues.

(2) The applicant will be provided with an estimate of the Review Fee as determined by the Department and the Town Engineer. This estimated fee must be paid to the town prior to the start of the review process, unless the Department approves other arrangements for the applicant to pay consultants directly when services are provided.

c) Inspection Fees

An Inspection Fee of fifty (50) dollars shall be paid by the applicant for each site inspection conducted by Town personnel during the construction of the project. The cost of any inspection conducted by a professional consultant shall be paid for by the applicant as provided in Section 1.b).

ARTICLE IX
Adoption

Section 1 - Effective Date.

These Regulations shall be in full force and effect after their adoption in accordance with Section 8-4 of the Town Charter.

END

APPENDIX A - DEFINITIONS

Definitions. Terms which are not defined herein shall be interpreted as commonly used. Throughout these Regulations, *shall* is mandatory, and *may* is permissive. Definitions shown in italics are taken from Chapter 13.14 of the Town of Braintree Ordinances. Unless the content specifically indicates otherwise, the meaning of the terms used in these Regulations shall be as follows:

Alter: Any activity which will measurably change the ability of a ground surface area to absorb water or will change existing surface drainage patterns. Alter may be similarly represented as "alteration of drainage characteristics", and "conducting land disturbance activities."

Applicant: Any person, individual, partnership, association, firm, company, corporation, trust, authority, agency, department, or political subdivision of the Commonwealth or the Federal government (to the extent permitted by law), requesting a Stormwater Management Permit.

Best Management Practices (BMPs): Structural, non-structural and managerial techniques that are recognized to be the most effective and practical means to prevent and/or reduce increases in stormwater volumes and flows, reduce point source and non-point source pollution, and promote stormwater quality and protection of the environment. "Structural" BMPs are devices that are engineered and constructed to provide the temporary storage and treatment of stormwater runoff. "Non-structural" BMPs use natural measures to reduce pollution levels, do not require extensive construction efforts, and/or promote pollutant reduction by eliminating the pollutant source

Building Storm Drain: The pipe which connects a building drain conveying stormwater to a storm drain or other place of disposal. The building storm drain begins 10 feet outside the inner face of the building foundation wall and extends to and includes the connection to the Town's storm drain. It may include leaders from roof drains, downspouts, trench drains or similar, but not floor drains collecting flow considered to be sewage.

Certified Professional I Erosion and Sediment Control (CPESC): a certified specialist in soil erosion and sediment control. This certification program, sponsored by the Soil and Water Conservation Society in cooperation with the American Society of Agronomy, provides the public with evidence of professional qualifications.

Cleanout: A device or structure designed to provide access to a building storm drain for the purpose of eliminating blockages and removing deposited or accumulated materials.

Clean Water Act: *The Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) as it is amended from time to time.*

Conservation Commission: Town of Braintree Conservation Commission through its staff within the Department of Planning and Community Development.

Construction Activity Stormwater Permit: An EPA NPDES General Permit for the discharge of pollutants in stormwater runoff from areas where the soil disturbing activities, construction materials, or equipment storage or maintenance, or other industrial stormwater directly related to the construction process are located.

Conveyance: Any structure or device including pipes, drains, culverts, curb breaks, paved swales or man-made swales of all types designed or utilized to move or direct stormwater runoff or existing water flow.

Cooling water: The water discharged from any system of condensation, air conditioning, cooling, refrigeration, or other system of heat transfer.

DEP: The Massachusetts Department of Environmental Protection.

Department: The Braintree Department of Public Works.

Dewatering Discharge: Groundwater or surface water which is removed from a site and discharged beyond the limits of the site by means of gravity or pumping.

Director: The Director of the Braintree Department of Public Works, or his/her designee.

Discharge of Pollutants: The addition, from any source, of any pollutant or combination of pollutants into the MS4 or into the waters of the United States or Commonwealth from any source.

Drainage Easement: A legal right granted by a landowner to a grantee allowing the use of private land for stormwater management purposes.

EPA: The United States Environmental Protection Agency.

Erosion: The wearing away of the land surface by natural or artificial forces such as wind, water, ice, gravity or vehicle traffic and the subsequent detachment and transportation of soil particles.

Erosion Control: The prevention or reduction of the movement of soil particles or rock fragments.

Erosion and Sediment Control Plan: A plan that shows the location and construction detail(s) of the erosion and sediment reduction controls to be utilized for a construction site.

Flood Control: The prevention or reduction of flooding and flood damage.

Flooding: A local and temporary inundation or a rise in the surface of a body of water such that it covers land not usually under water.

Floor drain: An intended drainage point in an otherwise impervious floor which serves as the point of entry into any subsurface drainage, sewage, treatment, disposal, containment, or other plumbing system.

General Permit: *The National Pollutant Discharge Elimination System General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems issued by the United States Environmental Protection Agency.*

Grading: Changing the level or shape of the ground surface.

Groundwater: All water beneath any land surface including water in the soil and bedrock beneath water bodies.

Hazardous Waste: A waste, or combination of wastes, that at the time of discharge:

(a) Is identified as a hazardous waste by EPA pursuant to the *Resource Conservation and Recovery Act, 42 USC 6901, et seq.*, and is listed in *40 CFR Part 261*, as amended from time to time;

(b) Has any of the hazardous waste characteristics identified by EPA in *40 CFR Part 261* as amended from time to time;

(c) Has been identified by DEP as a hazardous waste pursuant to M.G.L. c. 21C and is listed in 310 CMR 30.000; as amended from time to time; or

(d) Has any of the hazardous waste characteristics identified by DEP in 310 CMR 30.000, as amended from time to time.

(e) A waste that would be a hazardous waste pursuant to the EPA or DEP criteria but for the fact that it is discharged to the sanitary sewer system shall be, for purposes of this definition, a hazardous waste.

Hotspot: Land uses or activities with higher potential pollutant loadings, including but not limited to auto salvage yards, auto fueling facilities, fleet storage yards, commercial parking lots with high intensity use, road salt storage areas, commercial nurseries and landscaping companies, marinas and boat yards, outdoor storage and loading areas of hazardous substances.

Illicit Connection: *Any surface or subsurface drain or conveyance which allows an illicit discharge into a storm drain, including without limitation, sewage, process wastewater, or wash water and any connections from indoor drains, sinks, or toilets regardless of whether said connection was previously allowed, permitted, or approved before the effective date of this regulation.*

Illicit Discharge: *the dumping or discharging of any pollutant or non-stormwater discharge into the municipal storm drain system, into a watercourse, or into waters of the United States and/or the Commonwealth, except as exempted in § 13.14.030.*

Impaired Water : A water body that does not meet the quality standards for one or more of its designated uses and is therefore listed in categories 4 or 5 of the five part categorization approach used for classifying the water quality standards attainment status for water segments under the TMDL program.

Impervious Surface: Any material or structure on or above the ground that prevents water from infiltrating through the underlying soil. Impervious surface is defined to include, without limitation: paved parking lots, sidewalks, rooftops, driveways, patios and paved, gravel and compacted dirt surfaced roads.

Industrial Activity Stormwater Permit: An EPA NPDES General Permit for the discharge from any conveyance activity that is used for collecting and conveying stormwater that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant.

Infiltration: The act of conveying surface water into the ground to permit groundwater recharge and the reduction of stormwater runoff from a project site.

Land Disturbance: *Any activity that removes the surface cover from land, changes the grade or exposes soil to the potential influence of stormwater.*

Massachusetts Stormwater Standards: *The performance standards issued by the Massachusetts Department of Environmental Protection (DEP), codified in the regulations at 310 CMR 10.05(6)(k)-(q), and further defined and specified in the Massachusetts Stormwater Handbook issued by the DEP.*

Municipal Storm Drain System or Municipal Separate Storm Sewer System (MS4): *The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the Town.*

National Pollutant Discharge Elimination System (NPDES) Permit: The permit required and issued by EPA and/or DEP to control point source discharges of pollutants to waters of the United States or separate storm drain systems. It shall also mean the permit issued to the Town by the EPA and/or DEP for its combined sewer and stormwater discharges.

New Development: Any construction or land disturbance of a parcel of land that is currently in a natural vegetated state and does not contain alteration by man-made activities.

Non-point Source Pollution: Pollution from many diffuse sources caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into water resource areas.

NPDES Notice of Intent (NOI): The form completed and submitted to the EPA by a person seeking to include a discharge under an NPDES General Permit.

Oil trap: Shall mean a receptacle designed to separate petroleum-based oil and grease, from water. Also called a separator in the Uniform State Plumbing Code, 248 CMR 2.00.

Operation and Maintenance (O&M) Plan: A plan that defines the functional, financial and organizational mechanisms for the ongoing operation and maintenance for a stormwater management system to ensure that it continues to function as designed.

Outfall: The point at which stormwater flows out from a point source into the waters of the United States and/or Commonwealth.

Owner : *A person who alone or jointly or severally with others has the legal title to any premises or has care, charge or control of any premises as agent, executor, administrator, trustee, lessee or guardian of the estate of the holder of legal title.*

Person: *An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the Commonwealth or the Federal government, to the extent permitted by law, and any officer, employee, or agent of such person.*

Planning Board: The Planning Board within the Braintree Department of Planning and Community Development.

Point Source: Any discernible, confined and discrete conveyance, including but not limited to: any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, or container from which pollutants are or may be discharged.

Pollutant(s): Any element or property of sewage, residential, agricultural, industrial, or commercial waste, runoff, leachate, heated effluent, or other matter whether originating at a point or non-point source, that is or may be introduced into any storm drain system, waters of the United States, and/or Commonwealth. Pollutants shall include without limitation:

1. paints, varnishes, solvents;
2. oil, grease, antifreeze, other automotive fluids and/or products;
3. non-hazardous liquid and solid wastes;
4. refuse, garbage, litter, rubbish, yard wastes, or other discarded or abandoned objects, ordnances, accumulations and floatables;
5. pesticides, herbicides and fertilizers;
6. hazardous materials and wastes;
7. sewage;

8. dissolved and particulate metals;
9. metal objects or materials;
10. animal wastes;
11. rock, sand, salt, soils, or other products/materials that mobilize in surface water runoff;
12. construction wastes and/or residues.
13. And any substance that causes or contributes to the impairment of the waters of the Commonwealth.

Pollutant of Concern: A pollutant which causes or contributes to a violation of a water quality standard, including a pollutant which is identified as causing impairment in the State's Integrated List of Waters (303(d) list).

Pre-Development: The conditions that exist at the time that plans for the land development of a tract of land are submitted to the Department. Where phased development or plan approval occurs (preliminary grading, roads and utilities, et.) the existing conditions at the time prior to the first plan submission shall establish pre-development conditions.

Post-Development: The conditions that reasonably may be expected or anticipated to exist after completion of the land development activity on a specific site or tract of land. Post-development refers to the phase of a new development or redevelopment project after completion and does not refer to the construction phase of a project.

Private storm drain: A storm drain and components which are not owned by the Town. Private Storm Drains and stormwater runoff facilities include, but are not limited to, building storm drains, drains, catch basins and manholes located on private property and not located within an easement held by the Town, and storm drains owned by other municipalities and public agencies. The connection from a private storm drain to the public storm drain system is also owned and maintained by the owner of the private storm drain.

Receiving waters shall mean any watercourse, river, pond, wetland, ditch, lake, aquifer, ocean or other body of surface water or groundwater that receives a discharge of stormwater.

Recharge: The replenishment of underground water reserves.

Redevelopment: Development, rehabilitation, expansion, demolition or phased projects that disturb the ground surface on previously developed sites.

Runoff: Rainfall, snowmelt, or irrigation water flowing over the ground surface.

Sanitary Sewer or Sewer: A pipe designed to carry wastewater, including but not limited to sanitary sewage and industrial wastes.

Sediment: Mineral or organic soil material that is transported by wind or water, from its origin to another location; the product of erosion processes.

Sedimentation: The process or act of deposition of sediment.

Site: The parcel of land being developed, or a designated planning area in which the land development project is located.

Stabilization: The use, singly or in combination, of mechanical, structural or vegetative methods, to prevent or retard erosion.

State Clean Water Act: *Massachusetts General Laws Chapter 21.*

Storm drain: A pipe or conduit designed to carry stormwater, surface water or runoff.

Stormwater: *Stormwater runoff, snow melt runoff and drainage of any water resulting from rainfall or other precipitation that runs off surfaces during or after a storm. and surface runoff and drainage.*

Stormwater Authority: The Braintree Department of Public Works or its authorized agent(s). The Department of Public Works is responsible for coordinating the review, approval and permit process as defined in these Regulations. Other Boards and/or departments participate in the review process as defined in these regulations.

Stormwater Management: The use of structural or non-structural practices that are designed to reduce stormwater runoff, pollutant loads, discharge volumes, and/or peak flow discharge rates.

Stormwater Management Permit (SMP): The permit required and issued by the Department authorizing the connection the Town's storm drainage systems.

Stormwater Management Permit Application: The form provided by the Department and completed and submitted, along with any required attachments, to the Department by the property owner or by the owner's agent prior to construction, reconstruction, repair or modification of a connection or an appurtenance to the Town's storm drains and stormwater runoff facilities.

Surface water: All water appearing on the earth's surface exposed to the atmosphere, such as rivers, lakes, streams, and oceans.

Total Maximum Daily Load (TMDL): A calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.

Town: The Town of Braintree.

Treatment system or pretreatment system: Any and all devices, equipment, or works, including Best Management Practices, used in the pumping, storing, treating, recycling, and reclaiming of stormwater.

TSS: Total Suspended Solids.

Watercourse: A natural or man-made channel through which water flows or a stream of water, including a river, brook or underground stream.

Water Quality Standards: The standards contained in 314 CMR 4.00 that define the water goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses.

Water Quality Volume (WQV): The volume of runoff that must be used to determine the design of a Best Management Practice (or series of practices) to achieve a specified level of treatment (in this case 80% removal of total suspended solids – TSS) under the Massachusetts DEP Stormwater Management Policy.

APPENDIX B – STORMWATER MANAGEMENT PLAN DESIGN CRITERIA

The following additional requirements apply to all Major Projects unless otherwise determined by the Department:

Section 1- Treatment Requirements.

Every property owner who directly or indirectly discharges stormwater to the Town stormwater system or a private infiltration system shall provide the treatment system necessary to ensure that the discharge complies with the requirements of the Planning Board, Conservation Commission and these Regulations including but not limited to: Stormwater management systems designed on sites with documented soil contamination or systems designed on industrial sites shall not include BMPs that promote infiltration and shall instead require use of treatment BMPs on site.

Stormwater management systems designed to include infiltration near environmentally sensitive areas, including public water supplies, Interim Wellhead Protection Areas, and Zones II, A, B, and C, swimming beaches, and cold water fisheries, shall incorporate designs that allow for shutdown and containment where appropriate to isolate the system in the event of an emergency spill or other unexpected event. In order to protect these resources, any stormwater management system designed to infiltrate stormwater near environmentally sensitive areas must, prior to infiltration, provide the level of pollutant removal equal to or greater than the level provided through the use of bio-filtration of the same volume of runoff.

Treatment systems shall be designed to avoid disturbance of areas susceptible to erosion and sediment loss.

All BMPs installed as part of the sites stormwater treatment system shall be selected and constructed in accordance with the Massachusetts Stormwater Handbook Volume 2 Chapter 2, as amended.

Section 2 – Treatment Standards for New Development and Re-development.

Stormwater Management Systems shall be designed to retain and/or treat the first one inch (1″) of runoff from all impervious surfaces on the site. The portion of the first one inch (1″) which cannot be feasibly retained and/or infiltrated shall be treated using treatment methods consistent with the Draft or Final Total Maximum Daily Loads for affected receiving waters and any additional treatment requirements in the Town of Braintree's MS4 Permit. Pre-treatment of runoff from paved surfaces is required to remove 44% of the Total Suspended Solids prior to infiltration. Driveways associated with applications for single-family dwellings are exempt from this requirement as per the 2008 Mass DEP Stormwater Handbook, but to the extent practicable, runoff from such driveways shall be directed to adjacent pervious surfaces.

These standards shall be met through a combination of practices designed to retain runoff on site (environmentally sensitive site design, low impact development techniques, green infrastructure) where technically feasible, and stormwater BMPs designed to treat the remainder of the runoff that cannot be retained on site due to site constraints. The level of pollutant removal from BMPs shall

be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool. BMPs must be chosen to maximize reduction of pollutants identified in the approved TMDL. BMPs must be selected and designed using the appropriate criteria from the most recent Massachusetts Stormwater Handbook. For other structural stormwater controls not included in the Handbook or for which approximate pollutant removal capabilities have not been provided, the pollutant removal effectiveness must be documented through prior studies, literature reviews, or other means and must receive approval from the Department. The Department may issue one or more Guidances identifying BMPs or combinations of BMPs that will maximize reduction of each pollutant of concern.

Section 3 – Major Permit Conditions.

The Department may condition permits as it deems necessary. All major permits will, at a minimum, include the following conditions:

1) The treatment system shall include the development of a long term Operation and Maintenance plan to inspect and repair installed BMPs to ensure that they are functioning according to manufacturer or design specifications. Any subsequent proposed changes in a treatment system or method of operation shall be approved by the Director before modification of such a facility.

2) Permittees shall submit as-built drawings no later than one year after completion of construction projects. The as-built drawings must depict all on site controls, both structural and non-structural, designed to manage stormwater associated with the completed site.

3) The treatment system shall be continuously maintained in satisfactory and effective operation. All costs associated with treatment system planning, design, construction, operation and maintenance shall be borne by the owner or property owner. The Town shall have the right to inspect such facilities in accordance with Article VII of these Regulations.

Section 4 – NPDES Notice of Intent and Permit.

Every person who is required to be covered under a Construction Activity Permit shall submit to the Department a copy of the completed Notice of Intent or individual application as submitted to EPA, and the information identified in items 1 through 5 below, as applicable.

1) Address of the building (or premises) where the discharge will take place and the name and address of the building (or premises) owner;

2) Name of a contact person, title and phone number;

3) A site plan or sketch which shows the location of the connection of the building storm drain or the point(s) of discharge to the Town's storm drainage system, including the street name, and the size of the storm drain to which the Stormwater will discharge;

4) Existing NPDES permit number, if any;

4) Facility's Assessor's Parcel Number

Section 5 – Storm Drain Extensions.

Any person may propose an extension, replacement or relocation of a Town storm drain to serve a new or rehabilitated building. At least 60 days prior to initiating any work the applicant shall submit two copies of the Stormwater Management Permit – Major Project application form. Every extension, replacement or relocation of a Town storm drain shall be designed and constructed in accordance with the Department's design requirements, specifications and standard details. Any tests, studies, investigations and inspections required for design and construction shall be conducted in accordance with the Department's requirements. All expenses incurred pursuant to the extension, replacement or relocation of a Town storm drain including but not limited to application, engineering, legal, permitting, construction and inspection costs, shall be borne by the applicant.

After constructing a Town approved public storm drain extension, replacement or relocation, the owner shall, upon approval and acceptance by the Director, transfer ownership of the storm drain to the Town through a Release Agreement in a form prescribed by the Town. The Release Agreement shall be accompanied with as-built plans for the extended, replaced or relocated storm drain and any other information required by the Town. Until such time as the Release Agreement is signed by the Town, the extended, replaced or relocated storm drain shall be considered to be privately owned by the applicant and shall be subject to the requirements pertaining to private Storm Drains and Stormwater Runoff Facilities contained in these Regulations.

APPENDIX C – EROSION AND SEDIMENT CONTROL PLAN REQUIREMENTS

1. General

The application for a Stormwater Permit **(Major)** shall include an Erosion and Sediment Control Plan (ESCP) to describe the nature and purpose of the proposed development, pertinent conditions of the site and the adjacent areas, and proposed erosion and sediment controls. The applicant shall submit such material as is necessary to show that the proposed development will comply with the design requirements as specified herein and in accordance with the Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas – A Guide for Planners, Designers and Municipal Officials, latest edition. The applicant may submit the SWPPP in place of the ESCP, if the NPDES General Permit for Discharges for Construction Activities applies.

2. Applicability

Single-family Applicants – Single-family applicants shall submit the ESCP as outlined in this section. However, the requirement for stamped and certified plans shall not apply to single-family applicants.

Commercial and Other Non-Single-Family Applicants – Commercial and other non-single-family applicants shall submit the ESCP as outlined in this section.

3. Contents

The ESCP shall include the following:

(a) Contact Information. Names, addresses and telephone numbers of the property owner/applicant, and applicant's technical representative(s) or firms(s) preparing the ESCP, if different from the Permit.

(b) Drainage patterns of surface runoff and approximate slopes anticipated after major grading activities (Construction Phase Grading Plans)

(c) Location and details of erosion and sediment control measures with a narrative of the construction sequence/phasing of the project, including both operation and maintenance for structural and non-structural measures, interim grading and construction and waste material stockpiling areas.

(d) Path and mechanism to divert uncontaminated water around disturbed areas, to the maximum extent practicable.

(e) Location and description of an implementation schedule for temporary and permanent seeding, vegetative controls and other stabilization measures.

(f) A description of construction and waste materials expected to be stored on-site and intended disposal methods. The ESCP shall include a description of controls to reduce pollutants from these materials, include a description of controls to reduce pollutants for these materials, including storage practices to minimize exposure of the materials to stormwater and spill prevention and response.

(g) Plan must be stamped and certified by a Professional Engineer registered in the Commonwealth of Massachusetts or a Certified Professional in Erosion and Sediment Control (CPESC)

(h) Such other information as is required by the Department.

APPENDIX D – OPERATIONS AND MAINTENANCE PLAN REQUIREMENTS

1. General

An Operation and Maintenance Plan (O&M Plan) is required at the time of application for all **Major** projects. Once approved by the Department the O&M Plan shall be recorded at the Norfolk County Registry of Deeds, shall remain on file with the Department and shall be an ongoing requirement.

2. Applicability

Single-family Applicants – Single-family applicants shall be exempt from submitting the O&M Plan as outlined in this section.

Commercial and other Non-single-family Applicants – Commercial and other non-single-family applicants shall submit the O&M Plan as outlined in this section.

3. Contents

The O&M Plan shall include:

(a) The names(s) of the property owner(s) for all components of the system.

(b) Maintenance agreements that specify:

i. The names and addresses of the person(s) responsible for operation and maintenance.
ii. The person(s) responsible for financing maintenance and emergency repairs.
iii. A Maintenance Schedule listing actions to be taken and a timeline for all drainage structures, include swales and ponds.
iv. A listing of easements with the purpose and location of each.
v. The signature(s) of the owner(s).
vi. Requirement to notify the Department in writing of changes in ownership or assignment of financial responsibility.

4. Modifications

Amendments to the O&M Agreement shall be made in writing to the Department and shall be signed by the responsible parties. The amended O&M Plan shall then be filed at the Norfolk County Registry of Deeds when approved.

5. Reporting

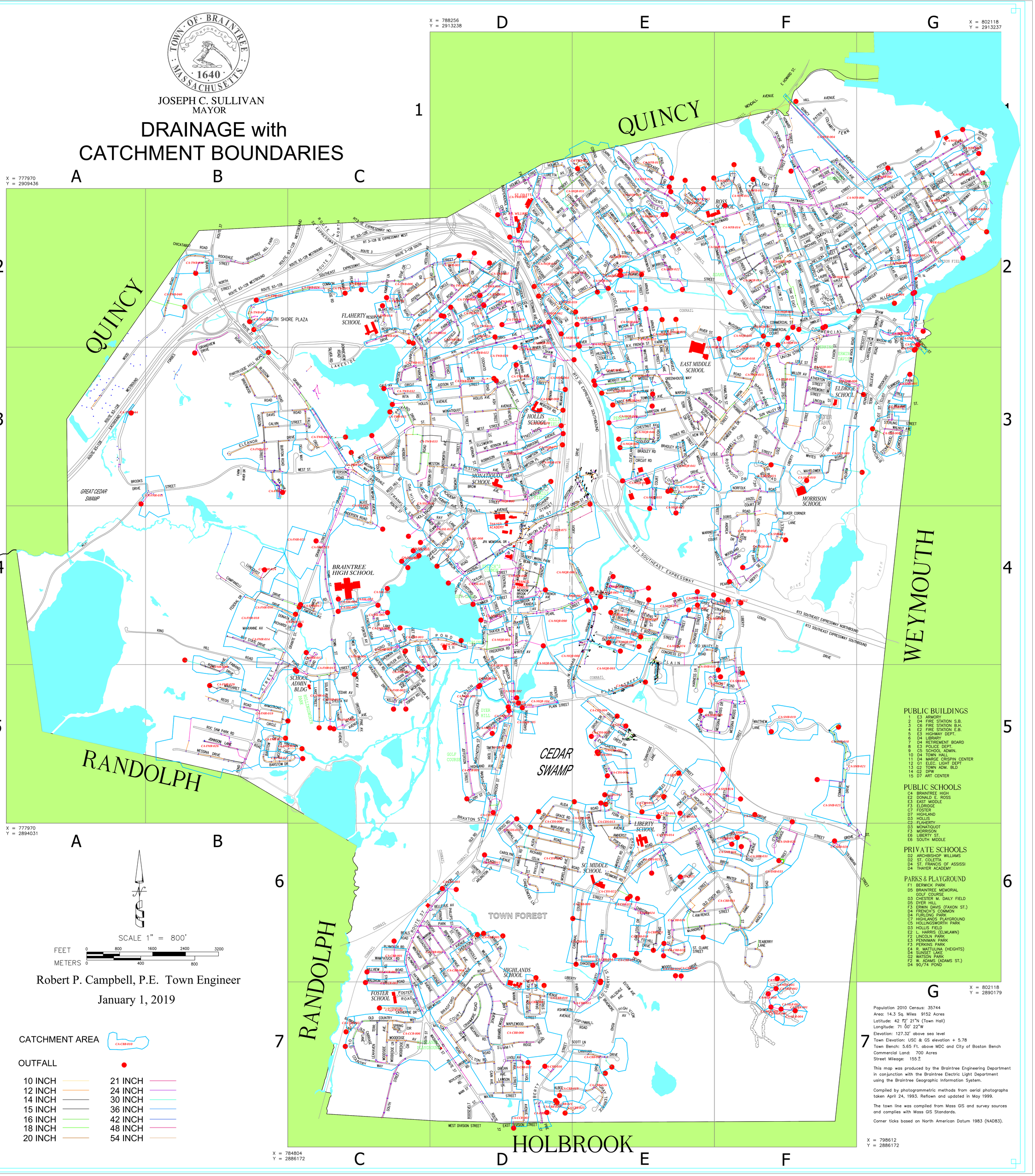
Annual reports with maintenance logs shall be sent to the Department by January 31 of each calendar year. Failure to comply with the reporting requirement shall be considered a violation of these regulations and may be subject to fines as per Ch. 13.14.050.D.

Appendix B: Storm System Mapping

TOWN OF BRAINTREE
INCORPORATED 1640
MASSACHUSETTS

JOSEPH C. SULLIVAN
MAYOR

DRAINAGE with CATCHMENT BOUNDARIES



D2 ABBOTT ST.		E3 KEW RD.	
E4 ABBY RD.		D6 KIMBALL RD.	
D3 ACADEMY ST.		C2 KIMBERLY LN.	
D2 ACORN CIR.		B4 KING HILL ST.	
D2 ACORN ST.		E3 KIRBY ST.	
E2 ADAMS ST.			
B3 ADDISON ST.		C5 LAKE ST.	
E7 ALBEE DR.		C2 LAKESIDE DR.	
D7 ALDEN RD.		D4 LAKEVIEW AVE.	
F3 ALEXANDER RD.		F1 LANCASTER RD. (discont)	
C2 ALFRED RD.		G3 LANTERN LN.	
C3 ALICE RD.		D6 LAUREL RD.	
D6 ALIDA RD.		F2 LAURIE LN.	
G2 ALLEN ST.		E2 LAWNVIEW DR.	
D3 ALVES AVE.		D7 LAWSON LN.	
E6 AMHERST RD.		C7 LEAHAVEN TERR.	
C4 ANDERSEN RD.		C2 LEDGE RD.	
F4 ANDREA DR.		G3 LEDGEWOOD RD.	
F6 ANGELA RD.		E2 LEMOYNE ST.	
G2 ARBORWAY DR.		F4 LENOX DR.	
C6 ARBUTUS AVE.		F3 LIBERTY ST.	
G2 ARDMORE ST.		D7 LIBERTY PARK AVE.	
G1 ARGYLE RD.		F3 LINCOLN ST.	
D6 ARLINGTON AVE.		D6 LINDA RD.	
B5 ARMSTRONG CIR.		F2 LINDEN ST.	
E2 ARNOLD ST.		F3 LISLE ST.	
G2 ARTHUR ST.		D7 LIVOLI AVE.	
D3 ASH ST.		E3 LOGAN DR.	
D7 ASHWORTH AVE.		C5 LOGAN RD	
D7 ASPINWALL RD.		D2 LONGWOOD RD.	
F3 ATHERTON ST.		D1 LORETTA AVE.	
G2 ATLAS RD.		F3 LOUISE RD.	
G1 AUDUBON AVE.		D2 LOWELL ST.	
G2 AUTUMN ST.		C5 LUNAR AVE.	
F3 AVERY RD.		C4 LUNDQUIST DR.	
F1 AVON PL.			
D4 AZEL RD.		F2 MAGNOLIA ST.	
		D7 MAIN ST.	
F3 BAKER AVE.		D7 MANN ST.	
B5 BARSTOW DR.		D3 MAPLE ST.	
C7 BAYBERRY LN.		D7 MAPLEWOOD TERR.	
B4 BAY STATE DR.		D2 MARCIA DR.	
D6 BEACON ST.		B5 MARGARET DR.	
C6 BEALS RD.		B4 MARIANNE AVE.	
F2 BEECH ST.		F1 MARIETTA AVE.	
G2 BEECHWOOD RD.		F4 MARINELLI CT.	
D7 BELKNAP RD.		C6 MARION DR.	
D6 BELLEVUE AVE.		D6 MARJORIE RD.	
G3 BELLEVUE RD.		E3 MARSHALL ST.	
F2 BELMONT ST.		D4 MARSHFIELD RD.	
F2 BERWICK ST.		C6 MASS AV.	
D2 BESTICK RD.		F5 MATTHEW LN.	
D3 BEVERLY CT.		D3 MAY ST.	
G2 BICKFORD RD.		F2 MAY ST.	
F6 BIRCH RD.		F3 MAYFLOWER RD.	
G3 BIRCHCROFT RD.		E6 McANDREW RD.	
C2 BLAKE BLVD.		B5 McCUE DR.	
E2 BLANCHARD RD.		F2 McCUSKER DR.	
B3 BLOSSOM DR.		C5 MEADOW RD.	
C3 BONNIEVIEW ST.		D4 MEADOWBROOK RD.	
E4 BOSCOBEL ST.		C3 MEGAN'S WAY	
F2 BOWDITCH RD.		E3 MERRITT AVE.	
E2 BOWER ST.		B5 MESSINA DR.	
D7 BOYLSTON RD.		F5 MESSINA WOODS DR.	
G2 BRADFORD RD.		E6 MICHELE LN.	
E3 BRADLEY RD.		E2 MIDDLE ST.	
E7 BRAEMORE PK.		G2 MILL LN.	
B2 BRAINTREE HILL PK.		F3 MILLER AVE.	
D7 BRAMBLEWOOD LN.		E3 MILLER ST.	
E5 BREGOLI LN.		D7 MILTON RD.	
B3 BRIERWOOD AVE.		D3 MONATIQUIOT AVE.	
D5 BRAXTON RD.		D6 MORELAND AVE.	
D6 BREWSTER AVE.		E2 MORRISON ST.	
G3 BROOKSIDE DR.		E2 MORRISON RD.	
A3 BROOKS DR.		D3 Mt. VERNON ST.	
D3 BROW AVE.		D3 Mt. VERNON AVE.	
F4 BUKER CORNER LN.		D4 MYRTLE AVE.	
E2 BURROUGHS RD.		E2 MYRTLE ST.	
B3 BURTON RD.			
D2 BUSHNELL TERR.		F2 NELSON ST.	
C5 BUTLER RD.		C3 NEWPORT AVE.	
E3 B.V. FRENCH ST.		F2 NEWTON AVE.	
		F2 NEWTON ST.	
		G2 NICHOLAS RD.	
E3 CABOT AVE.		F2 NICKERSON RD.	
D7 CAIN AVE.		F3 NORFOLK RD.	
E1 CAIRN ST.		B2 NORTH ST.	
B3 CALVIN ST.		D2 NO. BOWDITCH ST.	
C4 CAMED RD.		D3 NORTON ST.	
C4 CAMPANELLI DR.			
C4 CANAL ST.		D3 OAK ST.	
E7 CANAVAN DR.		F2 OAK ST. EAST.	
D6 CANDLEWOOD LN.		E6 OAKDEN AVE.	
G2 CAPE COD LN.		C4 OAK HILL RD.	
D2 CAPEN RD.		F2 OAKLAND ST.	
E6 CARDINAL CT.		E6 OAKLEDGE DR.	
D6 CAROLYNE AVE.		C7 OLD CARRIAGE LN.	
C4 CARTER RD.		E6 OLD COACH RD.	
C7 CATHERINE DR.		C7 OLD COUNTRY WAY.	
D2 CAVANAGH AVE.		B5 OLD KING HILL RD.	
D2 CEDAR AVE.		E4 OLD VALLEY RD.	
D2 CEDAR ST.		D7 OLDFSON ST.	
D2 CEDAR RD.		C5 OLYMPIA AVE.	
G2 CEDARCLIFF RD.		F2 ORCHARD ST.	
D6 CELIA RD.		C5 OREGON AVE.	
D4 CENTRAL AVE.		F6 O'TOOLE TERR.	
D4 CENTRAL ST.			
D2 CENTRE ST.			
B4 CHARLAM DR.		C3 PACKARD DR.	
D2 CHARLES ST.		E2 PANTANO ST.	
D2 CHERRY ST.		D6 PARK AVE.	
E4 CHERRY LN.		D2 PARK ST.	
E3 CHESTNUT AVE.		C3 PARKSIDE AVE.	
E1 CHICKADEE LN.		C3 PARKSIDE CIR.	
B2 CHICATABOT RD.		B3 PARTRIDGE HILL RD.	
E6 CHRISTINA DR.		F1 PATTEN AVE.	
D2 CHURCH ST.		D7 PAUL ST.	
E3 CINDY LN.		D6 PEACH ST.	
E3 CIRCUIT RD.		C2 PEAK ST.	
F3 CLAREMONT ST.		F4 PEARL PL.	
D3 CLARK ST.		D4 PEARL ST.	
F1 CLEVELAND AVE.		E3 PENNIMAN TERR.	
F1 CLIFF ST. (discont)		G2 PEREGRINE RD.	
G3 CLIFF RD.		E2 PERRY RD.	
F2 CLOVER RD.		C3 PETERSON RD.	
D3 COCHATO RD.		D6 PHILLIPS ST.	
D6 COCHETO ST.		D6 PHYLLIS AVE.	
D4 COLBERT RD.		G3 PILGRIM RD.	
C3 COLBY TERR.		C5 PINE ST.	
F1 COLUMBIA AVE.		F2 PINECREST RD.	
F6 COLUMBIAN ST.		D5 PLAIN ST.	
E4 COLUMBUS AVE.		D2 PLEASANT ST.	
F5 COMMERCE DR.		G2 PLEASANT VIEW AVE.	
F2 COMMERCIAL CT.		C6 PLYMOUTH AVE.	
G2 COMMERCIAL ST.		C6 PLYMOUTH RD.	
B2 COMMON ST.		B5 POND ST.	
E4 CONGRESS ST.		F2 POPLAR ST.	
F2 CONNELL ST.		C4 PORTER AVE.	
F3 CONNELLY CIR.		E6 PORTLAND RD.	
E1 CONRAD ST.		G1 POTTER DR.	
E3 COOLIDGE AVE.		F5 POULOS RD.	
F2 COTTON AVE.		F3 POWDER HILL DR.	
D7 COURT RD.		D5 PRENTIS RD.	
D7 CRANMORE RD.		G2 PRESCOTT LN.	
E4 CRAWFORD RD.		G3 PRESCOTT RD.	
E4 CRAWFORD ST.		D2 PRESIDENT RD.	
D4 CRESCENT AVE.		G2 PRIMROSE ST.	
D6 CROSS RD.		D6 PRISCILLA AVE.	
F2 CYPRESS ST.		E6 PROCTOR RD.	
		F2 PROSPECT ST.	
E6 DALE AVE.		D2 PROSPECT ST. N.	
F6 DANIEL RD.		E3 PUTNAM AVE.	
B3 DAVIS RD.			
D3 DEAN ST.			
D3 DEARING AVE.		F1 QUINCY AVE.	
F2 DEBORAH LN.			
D7 DEIGAN AVE.		D2 RAILROAD ST.	
C3 DELLS WAY		E3 RALEIGH RD.	
C4 DELTA RD.		D4 RANDALL AVE.	
E2 DEVON RD.		D4 RAY LN.	
C5 DEWEY AVE.		C3 REED HILL RD.	
F1 DEWEY RD.		B5 REGIS RD.	
D2 DICKERMAN LN.		C2 RESERVOIR AVE.	
D7 DIVISION ST.		C2 RESERVOIR CIR.	
F2 DOBSON RD.		B3 REX DR.	
C4 DONATA RD.		D6 RICHARD RD.	
F4 DORIS RD.		E3 RALEIGH RD.	
C2 DOVE CIR.		C4 RICHARDI LN.	
D7 DRAKE ST.		C3 RITA RD.	
E2 DRINKWATER AVE.		D3 RIVER ST.	
		F3 ROBBIE RD.	
		D1 ROBERT ST.	
E4 E. BOSCOBEL ST.		D3 ROBINSON AVE.	
G2 EDGEHILL RD.		B2 ROCKDALE ST.	
G2 EDGEMONT RD.		B5 ROC SAM PK. RD.	
E1 EDWARDS RD.		E2 ROGERS CIR.	
F4 EILEEN DR.		D2 ROINE RD.	
B3 ELEANOR DR.		B5 ROME DR.	
D5 ELLERY ST.		D7 ROOSEVELT ST.	
G3 ELLIOT ST.		C4 ROSE AVE.	
F2 ELLIS LN.		C3 ROSEDALE AVE.	
C3 ELLSMOORE TERR.		F3 ROSEWOOD DR.	
D3 ELLSWORTH ST.		C3 ROSS WAY.	
D2 ELM ST.		C4 ROYAL LAKE DR.	
D2 ELM TERR.		D2 RUSSELL RD.	
F3 ELM KNOLL RD.			
E2 ELMLAWN RD.		D4 SAFFORD ST.	
D4 ELMWOOD AVE.		E4 SAGAMORE ST.	
G3 ELMWOOD PK.		E6 St. CLAIRE ST.	
C4 EMERALD AVE.		E6 St. LAWRENCE ST.	
E2 ERICKSON ST.		C5 St. MICHAEL RD.	
F3 ESSEX RD.		D3 SAMPSON AVE.	
F2 ESTHER ST.		D3 SAMPSON PL.	
E7 EUTAW AVE.		D3 SAMPSON ST.	
D7 EVELYN LN.		D2 SCHOOL ST.	
E5 EVERGREEN AVE.		D2 SCHOOL ST WEST	
		E7 SCOTT LN.	
		D7 SELWYN RD.	
B5 FABIANO DR.		D5 SHAW AVE.	
D1 FAIRFIELD ST.		F1 SHAW ST.	
F2 FAIRMOUNT AVE.		D2 SHEFFIELD DR.	
C4 FAIRVIEW AVE.		F2 SHEPPARD RD.	
C3 FALLON CIR.		D6 SHERATON AVE.	
E3 FARM RD.		D3 SHERBROOKE AVE.	
B3 FARM RIVER DR.		C5 SHERIDAN RD.	
D2 FAULKNER PL.		C4 SHERMAN RD.	
F3 FAXON ST.		C3 SILVER RD.	
B4 FEDERAL DR.		F1 SKYLINE DR.	
E5 FERN RD.		D5 SMITH ST.	
G1 FERNCROFT RD.		D5 SMITH TERR.	
C3 FIVE CORNERS		C5 SOLAR AVE.	
B2 FORBES RD.		F2 SOMERVILLE AVE.	
E6 FOREST ST.		C7 SOUTH ST.	
C7 FOSTER RD.		G2 SPENCER ST.	
E4 FOUNTAIN ST.		E4 SPRING ST.	
E6 FOX HILL DR.		C7 SPRING GLEN CIR.	
C2 FRANCINE RD.		E2 SPRUCE ST.	
C3 FRANKLIN ST.		D6 STANDISH AVE.	
D4 FREDERICK RD.		D2 STATEN RD.	
D4 FRENCH AVE.		D2 STEDMAN AVE.	
F2 FRONT ST.		C5 STELLAR AVE.	
		G3 STERLING PK.	
C3 GALE AVE.		G3 STERLING ST.	
D5 GARDEN PK.		F3 STETSON ST.	
D3 GARDNER TERR.		E4 STEVENS AVE.	
D6 GARRISON AVE.		G3 STONEWOOD LN.	
D4 GEORGANNA ST.		E5 STONE CREST DR.	
E6 GERALDINE LN.		D2 STORRS AVE.	
D4 GILBERT L. BEAN DR.		C3 STRATHDEE CIR.	
C4 GLENDALE RD.		E3 STRATHMORE CIR.	
D6 GLENDON ST.		E3 STRATHMORE RD.	
G2 GLENROSE AVE.		D4 SUMMER ST.	
G2 GORDON RD.		C2 SUMMIT AVE.	
D6 GRACE RD.		D7 SUMMIT RIDGE DR.	
B3 GRANDVIEW DR.		D4 SUMNER AVE.	
B4 GRANITE ST.		E5 SUNNYSIDE LN.	
E7 GRAY TERR.		F3 SUN VALLEY DR.	
C5 GRAZIANO DR.		D2 SUNSET RD.	
E3 GREENHOUSE WAY		E4 SURRY LN.	
E3 GROSSMAN DR.		E6 SYCAMORE RD.	
E5 GROVE CIR.			
E5 GROVE ST.		F2 TABER CT.	
		C3 TALBOT RD.	
		C4 TALMADGE AVE.	
F2 HALEY AVE.		D4 TAYLOR ST.	
D4 HALL AVE.		F6 TEABERRY LN.	
F3 HAMILTON ST.		D4 TENNEY RD.	
D5 HANCOCK AVE.		D4 THAYER AVE.	
D4 HANCOCK ST.		D2 THAYER PL.	
D4 HANNAFORD TERR.		D2 THAYER RD.	
E5 HANNA NILES WAY		F6 THETFORD AVE.	
G1 HARBOR VILLA AVE.		D2 THORNDIKE ST.	
E3 HARDING AVE.		F2 TINGLEY CIR.	
E5 HARNESS LN.		F2 TINGLEY RD.	
E3 HARRISON AVE.		G2 TOMPSON RD.	
D6 HARVARD ST.		C5 TORREY RD.	
E3 HARVEST LN.		E3 TOTNES RD.	
F3 HATCH AVE.		C5 TOWER HILL RD.	
D2 HAVEN RD.		C4 TOWN ST.	
D2 HAWTHORN RD.		E3 TOWNSEND AVE.	
C6 HAYWARD AVE.		E6 TRAINOR DR.	
F2 HAYWARD ST.		G1 TREFTON DR.	
F3 HAZEL CT.		D3 TREMONT ST.	
C2 HEDLUND AVE.		D4 UNION PL.	
F3 HELEN RD.		D4 UNION ST.	
E5 HEMLOCK ST.		F2 UPLAND RD.	
C3 HERBERT RD.			
G2 HERITAGE LN.		G1 VENUS RD.	
G2 HEWMASON RD.		F1 VERANDA RD.	
E5 HICKORY RD.		D6 VERNON ST.	
D5 HIGHLAND AVE.		E4 VICTORIA AVE.	
F2 HIGHLAND AVE. E		G2 VIEW ST.	
E7 HIGH VIEW AVE.		E2 VINE ST.	
F1 HILL AVE.		G1 VINEDALE RD.	
F2 HILLCREST RD.		D2 VINTON AVE.	
E3 HILLIARD CT.		D7 VIRGINIA RD.	
F2 HILLSDALE AVE.			
F1 HILLSIDE AVE.		G1 WAINWRIGHT ST.	
F3 HILLSIDE RD.		C6 WALDRON RD.	
C6 HILL VIEW RD.		G3 WALNUT AVE.	
B5 HINGSTON CIR.		G2 WALNUT ST.	
D3 HOBART AVE.		C6 WAMPATUCK RD.	
F2 HOBART ST.		G2 WARREN AVE.	
F2 HOBART TERR.		D4 WASHINGTON PK. RD.	
D4 HOLBROOK AVE.		D2 WASHINGTON PL.	
E2 HOLDEN RD.		D1 WASHINGTON ST.	
D3 HOLLINGSWORTH AVE.		D7 WATER ST.	
C3 HOLLIS RD.		E3 WATSON ST.	
E5 HOLLY RD.		C4 WAYNE AVE.	
D1 HOLMES ST.		F4 WEBB ST.	
D2 HOME PARK RD.		D3 WEBSTER RD.	
D2 HOOKER ST.		F2 WELLINGTON ST.	
C5 HOOVER AVE.		D7 W. DIVISION ST.	
F1 HOWARD CT.		A4 WEST ST.	
F1 HOWARD ST.		D3 WESTON AVE.	
C2 HOWIE RD.		D3 WESTON CT.	
E3 HUNT AVE.		D2 WHITE RD.	
F2 HUNTLEY RD.		F3 WHITES HILL DR.	
		E3 WHITTIER RD.	
B5 IDA RD.		D6 WILDWOOD AVE.	
D2 INDEPENDENCE AVE.		F2 WILKINS RD.	
D2 INGLEWOOD ST.		F3 WILLARD ST.	
D4 IVORY ST.		E3 WILLIAMS CT.	
		G3 WILLIAMS ST.	
D2 JACKSON RD.		F2 WILLOW ST.	
E2 JAY ST.		D3 WILMARTH RD.	
D5 JEFFERSON ST.		E2 WILSON AVE.	
E5 JENSEN FARM RD.		D3 WINDEMERE CIR.	
E1 JERSEY AVE.		E3 WINSLOW RD.	
D4 JFK MEMORIAL DR.		F6 WINTER ST.	
E4 JOHN MAHAR HWY.		C6 WINTHROP AVE.	
E1 JOHN PAUL CIR.		B2 WOOD RD.	
B5 JOHNSON LN.		C7 WOODEDGE AVE.	
F2 JORDAN CIR.		C7 WOODEDGE CIR.	
C2 JOSEPH RD.		C7 WOODEDGE LN.	
D3 JUDSON ST.		F4 WOODLAND RD.	
		C7 WOODSIDE AVE.	
C5 KELLEY DR.		D3 WOODSUM DR.	
E4 KENDALL AVE.		D2 WORTHINGTON CIR.	
E6 KENMORE RD.		D3 WYMAN RD.	
G3 KENNING TERR.		D3 WYNOT RD.	
E3 KENSINGTON ST.		F4 ZANA PK. DR.	

SCALE 1" = 800'

FEET 0 800 1600 2400 3200

METERS 0 400 800

Robert P. Campbell, P.E. Town Engineer

January 1, 2019

CATCHMENT AREA CA-CBB-010

OUTFALL

10 INCH	21 INCH
12 INCH	24 INCH
14 INCH	30 INCH
15 INCH	36 INCH
16 INCH	42 INCH
18 INCH	48 INCH
20 INCH	54 INCH

PUBLIC BUILDINGS

1 E3 ARMORY
2 D4 FIRE STATION S.B.
3 C6 FIRE STATION B.H.
4 E2 FIRE STATION E.B.
5 E3 HIGHWAY DEPT.
6 D4 LIBRARY
7 D4 RETIREMENT BOARD
8 E3 POLICE DEPT.
9 C5 SCHOOL ADMIN.
10 D4 TOWN HALL
11 D4 MARGE CRISPIN CENTER
12 G1 ELEC. LIGHT DEPT
13 G2 TOWN ADM. BLD
14 G2 DPW
15 D7 ART CENTER

PUBLIC SCHOOLS

C4 BRAINTREE HIGH
E2 DONALD E. ROSS
E3 EAST MIDDLE
F3 ELDRIDGE
C7 FOSTER
D7 HIGHLAND
D3 HOLLIS
C2 FLAHERTY
D3 MONATIQUOT
F3 MORRISON
E6 LIBERTY ST.
E6 SOUTH MIDDLE

PRIVATE SCHOOLS

D2 ARCHBISHOP WILLIAMS
D2 ST. COLETTA
D4 ST. FRANCIS OF ASSISSI
D4 THAYER ACADEMY

PARKS & PLAYGROUND

F1 BERWICK PARK
D5 BRAINTREE MEMORIAL GOLF COURSE
D3 CHESTER M. DAILY FIELD
D5 DYER HILL
F3 ERWIN DAVIS (FAXON ST.)
D4 FRENCH'S COMMON
D4 FURLONG PARK
C7 HIGHLANDS PLAYGROUND
C5 HOLLINGSWORTH PARK
D3 HOLLIS FIELD
E2 L. HARRIS (ELMLAWN)
F2 LINCOLN PARK
E3 PENNIMAN PARK
F3 PERKINS PARK
E4 R. MATTULINA (HEIGHTS)
D4 SUNSET LAKE
G2 WATSON PARK
F2 W. ADAMS (ADAMS ST.)
D4 90/74 POND

Population 2010 Census: 35744
Area: 14.3 Sq. Miles 9152 Acres
Latitude: 42 ºº 21"N (Town Hall)
Longitude: 71 ºº 22"W
Elevation: 127.32' above sea level
Town Elevation: USC & GS elevation + 5.78
Town Bench: 5.65 Ft. above MDC and City of Boston Bench
Commercial Land: 700 Acres
Street Mileage: 155±

This map was produced by the Braintree Engineering Department in conjunction with the Braintree Electric Light Department using the Braintree Geographic Information System.

Compiled by photogrammetric methods from aerial photographs taken April 24, 1993. Reflown and updated in May 1999.

The town line was compiled from Mass GIS and survey sources and complies with Mass GIS Standards.

Corner ticks based on North American Datum 1983 (NAD83).

Appendix C: IDDE Employee Training Records

Illicit Discharge Detection and Elimination (IDDE)
Employee Training Sessions
Town of Braintree
June 2019

Date	Type of Training	Employee Name	Duration (hours)
12/12/2018	Dry weather insp.	Cynthia O'Connell Dave McKenna	7
12/19/2018	Software for field inspections	Julie Sullivan Dave McKenna Andrew Marron	2
5/28/2019	Dry weather insp.	Julie Sullivan Mike Donoghue	7
6/4/2019	Dry weather insp.	Julie Sullivan Mike Donoghue	7
6/4/2019	SERSG IDDE workshop	Cynthia O'Connell	6
6/10/2019	Dry weather insp.	Julie Sullivan Trevor Sass	5
6/11/2019	SERSG IDDE workshop	Julie Sullivan	6
6/17/2019	Software for field inspections	Cynthia O'Connell Julie Sullivan Susan Sass Ben Hulke Deb Saucier Andrew Marron Jim Arsenault	2

Appendix D: MS4 Permit Appendix H, Section III

III. Discharges to water quality limited waterbodies where bacteria or pathogens is the cause of the impairment

1. Consistent with part 2.2.2.c.i. of the permit, permittees that discharge to waterbodies that are water quality limited due to bacteria or pathogens, without an EPA approved TMDL, are subject to the following additional requirements to address bacteria or pathogens in their stormwater discharges.

2. Additional or Enhanced BMPs

    a. The permittee remains subject to the requirements of part 2.3. of the permit and shall include the following enhancements to the BMPs required by part 2.3 of the permit:

        i. Part 2.3.2. Public Education and outreach: The permittee shall supplement its Residential program with an annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee or its agents shall disseminate educational materials to dog owners at the time of issuance or renewal of a dog license, or other appropriate time. Education materials shall describe the detrimental impacts of improper management of pet waste, requirements for waste collection and disposal, and penalties for non-compliance. The permittee shall also provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria or pathogens. All public education messages can be combined with requirements of Appendix H part I and II as well as Appendix F part A.III, A.IV, A.V, B.I, B.II and B.III where appropriate.

        ii. Part 2.3.4 Illicit Discharge: The permittee shall implement the illicit discharge program required by this permit. Catchments draining to any waterbody impaired for bacteria or pathogens shall be designated either Problem Catchments or HIGH priority in implementation of the IDDE program.

3. At any time during the permit term the permittee may be relieved of additional requirements in Appendix H part III.2. applicable to it when in compliance with this part.

    a. The permittee is relieved of its additional requirements as of the date when one of the following criteria are met:
        i. The receiving water is determined to be no longer impaired due to bacteria or pathogens by MassDEP and EPA concurs with such a determination.
        ii. An EPA approved TMDL for the receiving water indicates that no additional stormwater controls are necessary for the control of bacteria or pathogens from the permittee's discharge based on wasteload allocations as part of the approved TMDL.
        iii. The permittee's discharge is determined to be below applicable water quality criteria[1] and EPA agrees with such a determination. The permittee shall submit data to EPA that accurately characterizes the concentration of bacteria or pathogens in their discharge. The characterization shall include water quality

[1] Applicable water quality criteria are the state standards that have been federally approved as of the effective date of this permit and are compiled by EPA at http://www.epa.gov/waterscience/standards/wqslibrary/

and flow data sufficient to accurately assess the concentration of bacteria or pathogens in all seasons during storm events of multiple sizes and for the duration of the storm events including the first flush, peak storm flow and return to baseflow.

b. In such a case, the permittee shall document the date of the determination, date of approved TMDL or date of EPA concurrence that the discharge meets water quality criteria in its SWMP and is relieved of any additional requirements of Appendix H part III.2. as of that date and the permittee shall comply with the following:
    i. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix H part III.2. to date to reduce bacteria or pathogens in its discharges, including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs
    ii. The permittee shall continue to implement all requirements of Appendix H part III.3. required to be done prior to the date of determination date, date of approved TMDL, or date of EPA concurrence that the discharge meets water quality criteria, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications

Appendix E: Outfall Inspection and Dry Weather Sampling SOP

Appendix E

Outfall Inspection and Dry Weather Sampling

Standard Operating Procedures

The goal of outfall inspections and dry weather sampling is to inspect the outfalls, identify stormwater outfalls that are suspected of sewage contamination and determine the general location of the potential source of contamination in the upstream storm drainage system. These standard operating procedures were developed for the Braintree IDDE program to provide guidance for their field work investigations.

Team Structure

To ensure safe, efficient, and practical field work procedures are maintained the following field team structure has been developed.

Team Leader – The Team Leader is responsible for planning and making arrangements so that all field equipment is available, including field test kits, rental orders, truck scheduling, scheduling the pre-event meeting, scheduling the event, bottle orders, courier scheduling and coordinating, ensuring the safety of the team, and making field decisions that deviate or are not covered by sampling SOPs. When necessary the Team Leader is also responsible for scheduling police details.

Crew Leader – Each crew shall have a single Crew Leader. For sampling events with multiple crews, there will be multiple Crew Leaders. The Crew Leader is responsible for ensuring the following:

- All of the required equipment is packed
- Team's adherence to the sampling plan
- Team's adherence to the Health and Safety Plan
- Chains of custody are filled out correctly
- Quality and accuracy of electronically and hand recorded data
- Sampling is conducted in accordance with this SOP

The Crew Leader will communicate with the Team Leader in the event that issues arise in the field, including any issues with equipment, sampling times, or deviations from SOPs.

Crew Member – The Crew Members shall serve to support for the Crew and Team Leaders as well as ensuring sampling is conducted in accordance with this SOP and following the Health and Safety plan.

Section 1 Safety Procedures

The Fieldwork Safety Plan shall be reviewed by all staff and followed at all times. The following safety procedures shall also be followed.

1.1 Vehicle Parking

The following procedures govern the parking of vehicles.

- *When not working in a roadway*, park in a public parking space if available. If not available, pull the vehicle off the road to the extent possible. If in the roadway or close to the roadway, set up cones to establish a safety area around the truck and the work area. Turn on the warning lights upon arrival. Keep the warning lights on until departure.
- *When working in the roadway*, park the truck between the work area and the direction of oncoming traffic. Turn on warning lights upon arrival. Keep the warning lights on until departure. Use cones to establish a safety zone in work area and area in front of traffic, facing oncoming traffic.

1.2. Personal Protective Gear

The following personal protective gear must be worn at all times:

- Steel toe boots
- Work pants
- Long sleeved shirt
- Safety vest

The following personal protective gear must be worn under the following circumstances:

- Safety glasses – When handling or coming in contact with sampling equipment, working in proximity to the manhole or a stormwater outfall:
- Nitrile gloves - When handling or coming into contact with sampling equipment
- Hard hat – When opening a manhole, working around the manhole area or closing the manhole
- Work gloves – When walking to and from site as well as opening manholes

1.3. Opening a Manhole

If the manhole is in the roadway, establish a safety zone as described in the Vehicle Parking Section (Section 1.1).

Upon opening the manhole, erect a manhole fall prevention device around the manhole. The manhole fall prevention device must be left in place until the manhole is closed. All observations, sampling, etc. must be performed from the outside of the manhole fall prevention device. If quality photos cannot be taken from outside the manhole fall prevention device, you can take photos from inside the device by opening one of the panels.

Section 2. Field Work Procedures

Dry weather outfall inspections are performed in order to identify outfalls with potential sewage contamination. When outfalls are identified as potentially contaminated with sewage, dry weather investigations are initiated upstream of the outfall in order to identify the source. These upstream source tracking investigations take place at manholes. Dry weath*er* conditions are defined as periods of time with no more than 0.1 inches of rainfall (as reported by the Blue Hill Observatory) and no significant snow melt in the previous 24 hours.

2.1 General

The list of activities to be performed before, during and after the sampling event are provided in Attachment 1: Field Work Logistics Check-List. The list of equipment is provided in Attachment 2: Equipment Checklist.

2.2 Outfall Inspections

The purpose of the outfall inspection is to determine if there is evidence that the outfall is or has been contaminated with sewage. The determination of contamination is made through visual observations, olfactory observations, bacteria sampling and/or field test kit measurements for ammonia, surfactants and chlorine. The outfall inspection procedure is shown in Figure 1.

In some cases, it may not be possible to find the outfall, or it may be inaccessible. Special care should be taken in accessing outfalls on private property. Permission from the property owner must first be obtained before accessing the outfall. If the outfall cannot be accessed, the inspection should be performed at the first accessible upstream manhole.

Once on site, record observations, GPS coordinates and measurements on the Outfall Inspection Form (see Attachment 3). In addition, take multiple photographs of the outfall (or manhole) and the surrounding area. Mobile data entry applications (such as Fulcrum) provide a convenient alternative to paper forms. Mobile data entry apps simplify the process of collecting GPS coordinates, taking photographs and managing the data.

If discharge from the stormwater outfall is present, the water should be tested for sewage contamination. Fill a clean, unused 1-liter collection bottle (provided by the laboratory) with the discharge from the outfall and follow the procedures in 2.2.1 – 2.2.3. The 1-liter collection bottle should be discarded after use and not used again.

If one or more of the **contamination criteria** listed below are met, the outfall is considered to be potentially contaminated with sewage:

- Olfactory of visual evidence of sewage
- Bacteria levels greater than four times the water quality criteria applicable to the receiving water
- Ammonia ≥ 0.5 mg/l or surfactants ≥ 0.25 ml/l, and bacteria levels greater than the water quality criteria applicable to the receiving water
- Ammonia ≥ 0.5 mg/l, surfactants ≥ 0.25 ml/l, and detectable levels of chlorine

All of these contamination criteria can be evaluated in the field with the exception of the bacteria. Bacteria samples must be sent to a laboratory and the results are typically not available for several days to a week.

The bacteria water quality criteria for freshwater is based upon *E. Coli* and the threshold is 235 cfu/100 ml. For brackish and marine waters, the water quality standard is based upon bacteria and the threshold is 61 cfu/100 ml.

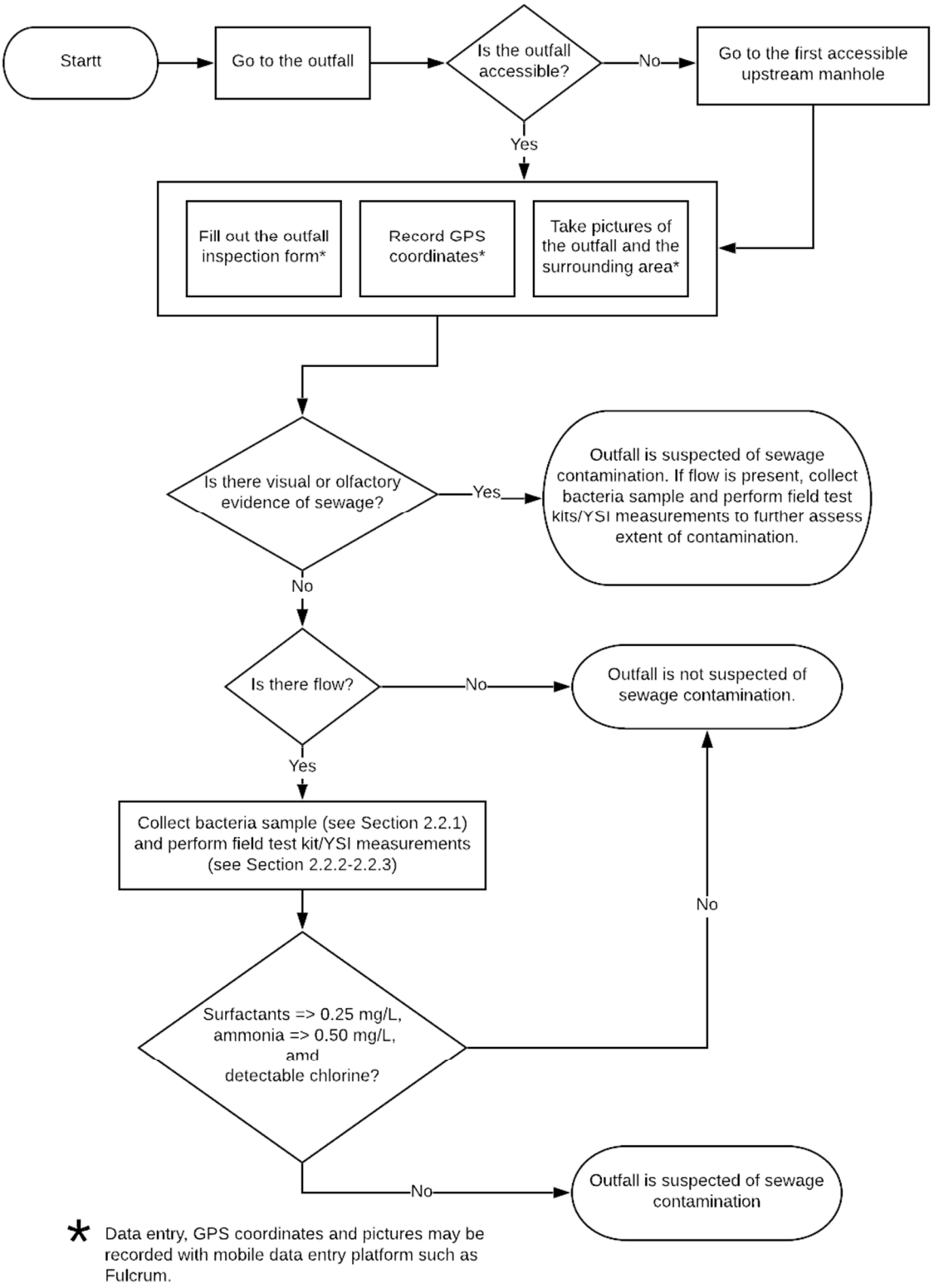


Figure 1. Outfall Inspection Procedures

2.2.1 Collect a bacteria sample - Label the bacteria sample bottle before collecting the sample. The label should include site ID, sample time, sample date and initials of the person who collected the sample. The bacteria sample bottle has a preservative.

Pour the water from the 1-liter collection bottle into the bacteria sample bottle. Fill the bacteria sample bottle as much as possible without overfilling. Place the bacteria sample bottle in the cooler with ice.

An additional duplicate bacteria sample should be collected for every 10 bacteria samples or each courier pick up (whichever comes first). The duplicate samples should only list the sample time in the field book and not on the sample bottle. The site ID for the duplicate sample should be DUP-XX, where the XX represents the number duplicate for that sample event. The time and location of where the duplicate sample was collected should be recorded in the field book.

The bacteria samples should be sent to the laboratory for analysis. Bacteria samples typically have a short holding time before they must be submitted to the laboratory; 6 hours is typical but check with the laboratory to determine their specific hold time requirements and plan accordingly when scheduling courier pickup times.

2.2.2 Perform measurements with the field test kits – Use the water from the 1-liter collection bottle to perform the field tests for ammonia, surfactants and chlorine in accordance with the manufacturer's directions. Rinse all equipment with distilled water before use. Record the results on the inspection form. Dispose of the field test kits in accordance with the manufacturer's instructions.

As shown in Table 1, there are several field test kits available for ammonia, surfactants and chlorine. When selecting field test kits, be sure to review their disposal requirements as some of the test kits contain hazardous materials and must be disposed of accordingly. It is generally preferable to select field test kits that do not have special disposal requirements.

2.2.3 Perform Portable Multiprobe measurements - Rinse the portable Multiprobe with distilled water prior to use. Fill the portable multiprobe's cap with water from the 1-liter collection bottle. Place the portable multiprobe in the cap. Wait for the measurements to stabilize. After the readings have stabilized, record the temperature, conductivity, salinity and pH on the inspection form. Then rinse remove the cap, pour out the water and rinse the portable multiprobe and its cap with distilled water.

As shown in Table 1, there are a number of portable multiprobes that can measure the required parameters.

TABLE 1. Instrumentation and Field Test Kits

Analyte or Parameter	Instrumentation (Portable Multiprobe)	Field Test Kit
Ammonia	CHEMetrics™ V-2000 Colorimeter Hach™ DR/890 Colorimeter Hach™ Pocket Colorimeter™ II	CHEMetrics™ K-1410 CHEMetrics™ K-1510 (series) Hach™ NI-SA Hach™ Ammonia Test Strips
Surfactants (Detergents)	CHEMetrics™ I-2017	CHEMetrics™ K-9400 and K-9404 Hach™ DE-2
Chlorine	CHEMetrics™ V-2000, K-2513 Hach™ Pocket Colorimeter™ II	NA
Conductivity	CHEMetrics™ I-1200 YSI Pro30 YSI EC300A Oakton 450	NA
Temperature	YSI Pro30 YSI EC300A Oakton 450	NA
Salinity	YSI Pro30 YSI EC300A Oakton 450	NA
pH	YSI Pro30 YSI EC300A Oakton 450	NA
Indicator Bacteria: *E. coli* (freshwater) or Enterococcus (saline water)	EPA certified laboratory procedure (40 CFR § 136)	NA

2.3 Upstream Source Tracking

If an outfall is suspected of sewage contamination, upstream manhole inspections should be initiated. The inspections should be performed during dry weather. The purpose of the upstream manhole inspections is to track the sewage contamination to the stormwater drain pipe where the contamination is entering the system. Figure 2 presents a flow diagram of the upstream source tracking procedure.

The basic idea behind the manhole inspections is that you start at the downstream end of the drain system and work your way upstream, methodically tracking pipes suspected of having contamination. The tracking continues until an upstream pipe is not contaminated, thereby isolating the illicit source to the last downstream pipe.

Pipe contamination is assessed based on observations of the pipe inlets in the manhole. Pipe inlets that are dry are eliminated from further upstream tracking. Pipe inlets with flow are tested for contamination using field test kits according to the procedures provided in Section 2.2.2 and 2.2.3. Pipe inlets with ammonia, surfactant and chlorine concentrations below the contamination thresholds shown in **Section 2.2** are considered negative for sewage contamination and are also eliminated from further upstream tracking. Pipe inlets exceeding the contamination thresholds are considered positive for contamination and the inspection proceeds to that pipe inlet's upstream manhole. Visual and olfactory observation may also be used to make a determination of pipe contamination.

Use the Manhole Inspection form (see Attachment 4) to document the manhole inspection. Create a new inspection using the form even if you can't find or open the manhole and indicate the result of the inspection accordingly (i.e., manhole not found, manhole could not be opened, etc.). Take multiple pictures of the manhole, including at least one picture showing the surrounding surface area and the interior of the manhole. As with the manhole inspection forms, mobile data collection platforms (such as Fulcrum) can be an effective alternative to paper forms by streamlining the data collection process.

Manholes are often present in active roadways. Special care should be taken in assessing the potential risks at each manhole site. The use of police details should be considered for roadways with heavy traffic or other safety risks.

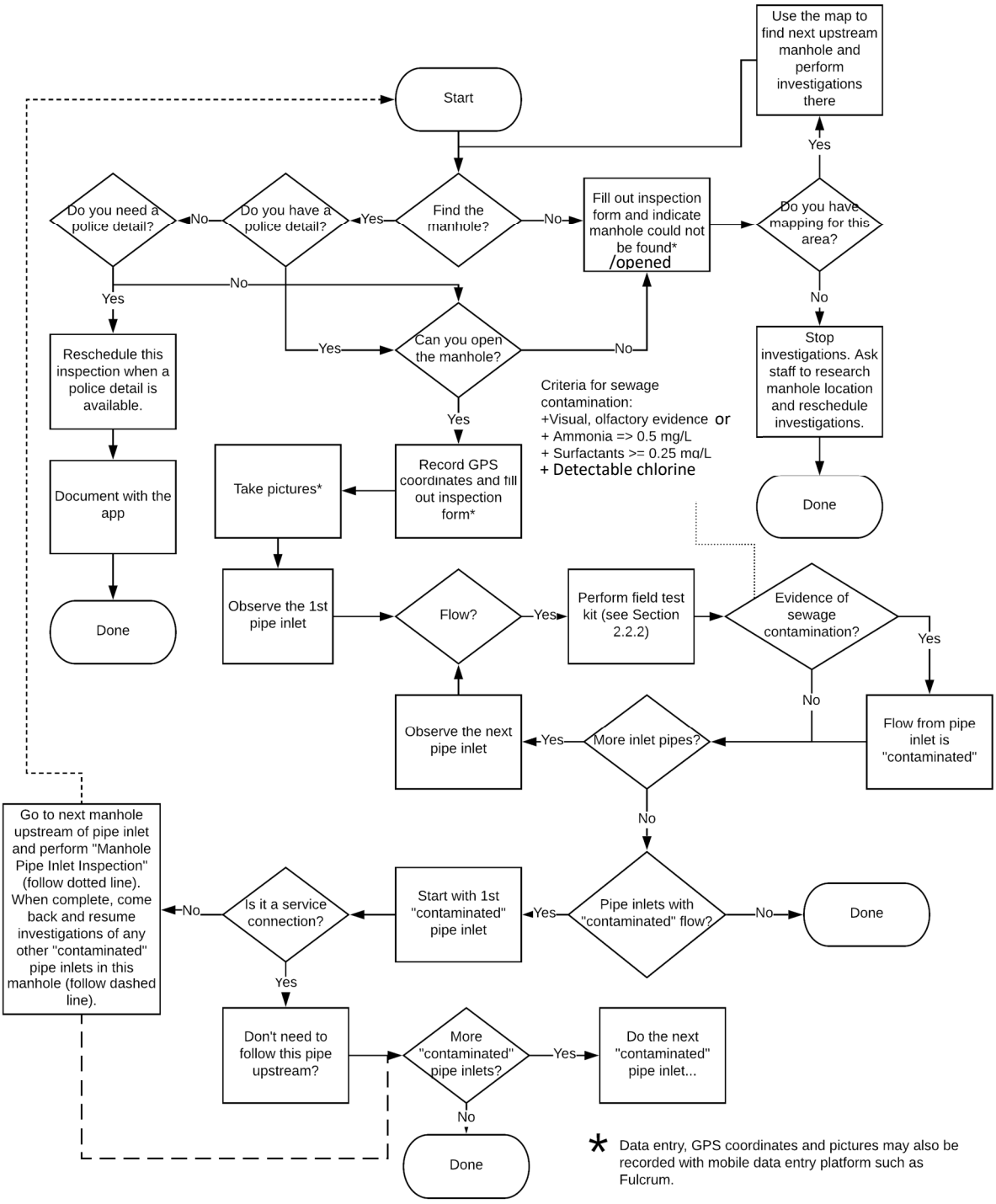


Figure 2. Upstream Source Tracking Procedures

Attachment 1. Field Work Logistics Check-List

One Week Prior to Sampling

- ☐ Order bottles – The Team Leader must order bottles. Request delivery for three days prior to sampling. E. Coli cups are good for 6 months before they expire, if we do not have 20 bottles in stock before an event please request these bottles.

- ☐ Equipment rental – The Team Leader must rent any needed equipment including a portable multiprobe for measuring pH, temperature, specific conductivity, and salinity. Schedule the equipment to be dropped off the day before the event.

- ☐ Field test kits – The Team Leader must make sure field test kits are available. Check in-stock availability of the field test kits. Have at least 20 test kits available to sample for surfactants, ammonia, and chlorine. Refill test kit codes for ordering are R-9400 Detergents, R-2504 chlorine, and R-1501 ammonia. Available at https://www.chemetrics.com/. **Some manufacturers have kits that contain Hazardous material and should only be handled by those with proper training.**

- ☐ Schedule truck – The Team Leader must schedule the truck for the sampling event.

72 Hours Prior to Sampling

- ☐ Review procedures - Each Crew Member must review the procedures. These procedures will also be in the hard copy field binder for reference in the field.

- ☐ Review sample bottles – The Team Leader must review the sample bottles. If there are any problems, notify the laboratory.

48 Hours Prior to Sampling

- ☐ Police details - If accessing the outfalls will require a police detail, the Team Leader must schedule police detail 48 hours in advance. Contact the Traffic Division, Officer Joseph Tosone at 781-794-8749.

- ☐ Courier Pickup – The Team Leader must schedule the courier 48 hours before the event. Schedule two courier pickups with the lab. E. Coli samples have a short hold time so two pickups are necessary. If starting at 7 AM, schedule pickups for 11 AM and 5 PM. If no samples need to be collected call and email lab in advance (generally 2 hours) of scheduled pickup time to cancel the pickup.

- ☐ Truck availability – The Team Leader must confirm truck availability.

Day before the event

- ☐ Internal coordination meeting – The Team Leader must conduct a meeting with Team Leader and Crew Members the day before the event to coordinate the arrival time, meeting location, responsibilities, and equipment packing.

- ☐ Inspect rental equipment – The Team Leader must inspect the rental equipment once it arrives to make sure that it is fully functional.

Day of event, before commencing work

- ☐ Notification – The Team Leader must email/text/call the project manager when everyone has arrived on site and you are ready to begin the tailgate meeting

- ☐ Tailgate meeting – The Team Leader must conduct the tailgate meeting prior to field work with all sample staff.

- ☐ Confirm courier schedule - Following the tailgate meeting, the Team Leader must send email to lab confirming courier pickup locations and times.

Day of event, before submitting samples

- ☐ Check bottles - Confirm that the bottles are properly filled and that the dates, sample IDs, and times match those listed in the field book.

- ☐ Chains of Custody - Note on the Chains of Custody that the samples should be billed to Town person and results emailed to you (whoever is filling out the chain) and the Team Leader

Day of event, after completing field work

- ☐ Notification – The Team Leader must email/text/call the project managers when all sampling has been concluded.

Attachment 2. Equipment Check-List

- ☐ Truck with warning beacon
- ☐ Sample bottles with coolers and blanks and Chains of Custody forms
- ☐ Ice for ice cooler
- ☐ Field test kits (be sure the following is included: colorimeters, instructions, supplies for disposal)
- ☐ Portable multiprobe (e.g., YSI)
- ☐ Manhole hook and Crowbar
- ☐ 12 cones (minimum)
- ☐ Flathead screw driver
- ☐ Clipboard and sufficient inspection forms
- ☐ Tablet, phone or camera for taking pictures (and recording inspections if using a mobile data collection app like Fulcrum).
- ☐ Shovel
- ☐ Manhole fall prevention device
- ☐ Safety vest, hard hat, work gloves, nitrile gloves (multiple sizes), clear safety glasses, safety boots, long sleeve shirt, work pants for all field personnel.
- ☐ Extendable sample pole
- ☐ 3 gallons of distilled water
- ☐ Hazardous waste bag and container for field test kits
- ☐ Flashlight with spare batteries
- ☐ Field book
- ☐ First aid kit

- ☐ Fieldwork Safety Plan
- ☐ Car phone/tablet charger or battery bank (with connector)
- ☐ Spare Cooler
- ☐ Ruler
- ☐ 3-foot ruler
- ☐ Foldable meter stick
- ☐ Project binder
- ☐ 2 pencils, 2 pens, 2 sharpies, 2 fine point sharpies
- ☐ 2 Ziploc bags
- ☐ 2 sampling backpacks
- ☐ 2 five-gallon buckets
- ☐ 2 trash bags
- ☐ Duct Tape

Attachment 3. Outfall Inspection Form

Stormwater Outfall Inspection Form

Section 1. General Information

Outfall ID	Inspector
Date/Time	Temperature
Latitude	Longitude

Section 2. Outfall Description

Type	Material (select only one)	Shape (select only one)	Dimensions
☐ Closed pipe	☐ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other	☐ Circular ☐ Single ☐ Elliptical ☐ Double ☐ Box ☐ Triple ☐ Other ☐ Other	Diameter/dimensions ____ in
☐ Open drainage	☐ Concrete ☐ Earthen ☐ Rip-rap ☐ Other	☐ Trapezoid ☐ Parabolic ☐ Other	Depth ____ in Top Width ____in Bottom Width ____ in

Outfall condition	☐ Normal	☐ Cracking	☐ Corrosion	☐ Other
Headwall present?	☐ No ☐ Yes	If yes, condition:	☐ Poor ☐ Fair	☐ Good
Sediment present?	☐ No ☐ Yes	If yes, depth ____ %		
Flow present?	☐ No	☐ Yes	☐ Standing water	
If flow present, approximate velocity:		☐ Trickle	☐ Moderate	☐ Heavy
If flow present, flow cross-section:		Flow depth in	Flow width in	
Outfall submerged?	☐ No	☐ Partially	☐ Fully	
Is the outfall tidally influenced?		☐ No ☐ Yes	If yes, depth of water above invert ____ in	

Section 3. Physical Indicators (flow flowing outfalls only)

Indicator	Severity (select only one)	Description (if Severity is not None, select all that apply)
Odor	☐ None ☐ Easily detected ☐ Faint ☐ Noticeable from a distance	☐ Sewage ☐ Petroleum/gas ☐ Sulfide ☐ Rancid/sour ☐ Other
Color	☐ None ☐ Faint colors in sample bottle ☐ Clearly visible in sample bottle ☐ Clearly visible in outfall flow	☐ Brown ☐ Red ☐ Gray ☐ Yellow ☐ Green ☐ Other ☐ Orange
Turbidity	☐ No cloudiness ☐ Cloudy ☐ Slight cloudiness ☐ Opaque	
Floatables (does not include trash)	☐ None ☐ Some ☐ Few/slight ☐ A lot	☐ Suds ☐ Sewage (toilet paper, etc.) ☐ Other ☐ Petroleum (oil sheen)

Section 4. Physical Indicators (for all outfalls)

Indicator (select if present)	**Description** (select all that apply)	**Comments**
☐ Deposits/stains	☐ Oil ☐ Flow line ☐ Sediments ☐ Paint ☐ Other	
☐ Pool quality issues	☐ Colors ☐ Oil sheen ☐ Floatables ☐ Excessive algae ☐ Other	
☐ Pipe benthic growth	☐ None ☐ Brown ☐ Orange ☐ Green ☐ Other	

Section 5. Field Measurements

Were field measurements performed?	☐ Yes	☐ No
Were laboratory samples collected?	☐ Yes	☐ No
If measurements/samples were collected, where from?	☐ Outfall	☐ Other location: ____
Intermittent flow trap used?	☐ No	☐ Yes
If intermittent flow trap used, which type?	☐ Caulk dam	☐ Sand bag ☐ Other

If field measurements were performed, provide results below:

Parameter	**Result**	**Units**
Velocity		ft/s
Temperature		◦F
pH		pH units
Ammonia		Mg/L

Parameter	**Result**	**Units**
Salinity		ppt
Conductivity		µS
Surfactants		ppm
Chlorine		ppm

Section 6. Outfall Area Plan

Section 7. General Comments

Attachment 4. Upstream Source Tracking Manhole Inspection Form

Manhole Inspection Form

Section 1. General Information

Manhole ID	Inspector
Date/Time	GIS Outfall ID
Outcome ☐ Could not open manhole ☐ Could not locate manhole ☐ Could not inspect manhole, police detail needed ☐ This is a sewer manhole, inspection halted ☐ Inspected manhole	Comments

Physical Indicators	**Severity** (select only one)	**Description** (if Severity is not None, select all that apply)
Odor	☐ None ☐ Easily detected ☐ Faint ☐ Noticeable from a distance	☐ Sewage ☐ Petroleum/gas ☐ Sulfide ☐ Rancid/sour ☐ Other
Floatables (does not include trash)	☐ None ☐ Some ☐ Few/slight ☐ A lot	☐ Suds ☐ Sewage (toilet paper, etc.) ☐ Other ☐ Petroleum (oil sheen)

If Known, Pipe Inlet Containing Floatables (clock position):_____

Section 2. Manhole Inlets

Inlet 1

Orientation (clock position w/ downstream @ 12:00)	**Samples Collected?** (select only one)
_____	☐ Yes ☐ No
Flow condition ☐ No Flow ☐ Trickle ☐ Moderate ☐ Heavy	
Sample Measurements	
Ammonia: _____ mg/l	Surfactants: _____ mg/l
Chlorine: _____ mg/l	Temp: _____ °F
Suspected of Contamination? ☐Yes	☐No

Inlet 2

Orientation (clock position w/ downstream @ 12:00)	**Samples Collected?** (select only one)
_____	☐ Yes ☐ No
Flow condition ☐ No Flow ☐ Trickle ☐ Moderate ☐ Heavy	
Sample Measurements	
Ammonia: _____ mg/l	Surfactants: _____ mg/l
Chlorine: _____ mg/l	Temp: _____ °F
Suspected of Contamination? ☐Yes	☐No

Inlet 3

Orientation (clock position w/ downstream @ 12:00)	**Samples Collected?** (select only one)
_____	☐ Yes ☐ No
Flow condition ☐ No Flow ☐ Trickle ☐ Moderate ☐ Heavy	
Sample Measurements	
Ammonia: _____ mg/l	Surfactants: _____ mg/l
Chlorine: _____ mg/l	Temp: _____ °F
Suspected of Contamination? ☐Yes	☐No

Inlet 4

Orientation (clock position w/ downstream @ 12:00)	**Samples Collected?** (select only one)
_____	☐ Yes ☐ No
Flow condition ☐ No Flow ☐ Trickle ☐ Moderate ☐ Heavy	
Sample Measurements	
Ammonia: _____ mg/l	Surfactants: _____ mg/l
Chlorine: _____ mg/l	Temp: _____ °F
Suspected of Contamination? ☐Yes	☐No

Appendix F: Outfall Inventory and Priority Ranking Matrix

Outfall Inventory and Priority Ranking Matrix - Town of Braintree - June 2019

Outfall ID	Receiving Water	Previous Screening Results Indicate Likely Sewer Input?[1]	Discharging to Area of Concern to Public Health?[2]	Frequency of Past Discharge Complaints[3]	Receiving Water Quality[4]	Density of Generating Sites[5]	Age of Development/ Infrastructure[6]	Historic Combined Sewers or Septic?[7]	Aging Septic?[8]	Culverted Streams?[9]	Score	Priority Ranking
CBB-001	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-002	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-003	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-004	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-005	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-006	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-007	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-008	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-009	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-010	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-011	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-012	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-013	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-014	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-015	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-016	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-017	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-018	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-019	Cranberry Brook	0	0	0	0	1	2	0	0	0	3	293
CBB-020	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-021	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-022	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-023	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-024	Cranberry Brook	0	0	0	0	1	2	0	0	0	3	293
CBB-025	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-026	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-027	Cranberry Brook	0	0	0	0	1	2	0	0	0	3	293
CBB-028	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-029	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-030	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CBB-031	Cranberry Brook	0	0	0	0	1	3	0	0	0	4	195
CCR-001	Cochato River	0	0	0	3	1	3	0	0	0	7	48
CCR-002	Cochato River	0	0	0	3	1	3	0	0	0	7	48
CCR-003	Cochato River	0	0	0	3	1	3	0	0	0	7	48
CCR-004	Cochato River	0	0	0	3	1	2	0	0	0	6	184
CCR-005	Cochato River	0	0	0	3	1	3	0	0	0	7	48
CCR-006	Cochato River	0	0	0	3	1	3	0	0	0	7	48
CCR-007	Cochato River	0	0	0	3	1	3	0	0	0	7	48
CCR-008	Cochato River	0	0	0	3	1	3	0	0	0	7	48
CDS-001	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-002	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-003	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-004	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-005	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-006	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-007	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-008	Cedar Swamp	0	0	0	0	1	1	0	0	0	2	310
CDS-009	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195

Outfall ID	Receiving Water	Previous Screening Results Indicate Likely Sewer Input?[1]	Discharging to Area of Concern to Public Health?[2]	Frequency of Past Discharge Complaints[3]	Receiving Water Quality[4]	Density of Generating Sites[5]	Age of Development/ Infrastructure[6]	Historic Combined Sewers or Septic?[7]	Aging Septic?[8]	Culverted Streams?[9]	Score	Priority Ranking
CDS-010	Cedar Swamp	3	0	0	0	1	3	0	0	0	7	48
CDS-011	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-012	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-013	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-014	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-015	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-016	Cedar Swamp	0	0	0	0	1	1	0	0	0	2	310
CDS-017	Cedar Swamp	0	0	0	0	1	1	0	0	0	2	310
CDS-018	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-019	Cedar Swamp	0	0	0	0	1	1	0	0	0	2	310
CDS-020	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-021	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-022	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-023	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-024	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
CDS-025	Cedar Swamp	0	0	0	0	1	3	0	0	0	4	195
FMR-001	Farm River	0	3	0	0	1	3	0	0	0	7	48
FMR-002	Farm River	0	3	0	0	1	3	0	0	0	7	48
FMR-003	Farm River	0	3	0	0	1	3	0	0	0	7	48
FMR-004	Farm River	0	3	0	0	1	3	0	0	0	7	48
FMR-005	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-006	Farm River	0	3	0	0	1	3	0	0	0	7	48
FMR-007	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-009	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-010	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-011	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-012	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-013	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-014	Farm River	0	0	0	0	2	3	0	0	0	5	187
FMR-015	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-016	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-017	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-018	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-019	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-020	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-021	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-022	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-024	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-025	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-026	Farm River	0	0	0	0	3	1	0	0	0	4	195
FMR-027	Farm River	0	0	0	0	2	3	0	0	0	5	187
FMR-028	Farm River	0	0	0	0	2	3	0	0	0	5	187
FMR-029	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-030	Farm River	0	0	0	0	1	3	0	0	0	4	195
FMR-031	Farm River	0	0	0	0	1	1	0	0	0	2	310
MLR-001	Mill River	0	0	0	0	1	2	0	0	0	3	293
MLR-002	Mill River	0	0	0	0	1	2	0	0	0	3	293
MLR-003	Mill River	0	0	0	0	1	2	0	0	0	3	293
MLR-004	Mill River	0	0	0	0	1	2	0	0	0	3	293
MLR-005	Mill River	0	0	0	0	1	2	0	0	0	3	293

Outfall ID	Receiving Water	Previous Screening Results Indicate Likely Sewer Input?[1]	Discharging to Area of Concern to Public Health?[2]	Frequency of Past Discharge Complaints[3]	Receiving Water Quality[4]	Density of Generating Sites[5]	Age of Development/ Infrastructure[6]	Historic Combined Sewers or Septic?[7]	Aging Septic?[8]	Culverted Streams?[9]	Score	Priority Ranking
MLR-006	Mill River	0	0	0	0	1	2	0	0	0	3	293
MLR-007	Mill River	0	0	0	0	1	2	0	0	0	3	293
MLR-008	Mill River	0	0	0	0	1	2	0	0	0	3	293
MLR-009	Mill River	0	0	0	0	1	2	0	0	0	3	293
MQR-002	Monatiquot River	3	3	0	3	2	3	0	0	0	14	1
MQR-003	Monatiquot River	3	0	0	3	2	3	0	0	0	11	4
MQR-004	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-005	Monatiquot River	3	3	0	3	1	3	0	0	0	13	2
MQR-007	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-008	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-009	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-010	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-011	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-012	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-013	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-014	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-015	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-016	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-017	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-018	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-019	Monatiquot River	0	3	0	3	1	3	0	0	0	10	6
MQR-020	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-021	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-022	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-023	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-025	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-026	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-027	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-028	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-029	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-030	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-031	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-032	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-033	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-034	Monatiquot River	0	0	0	3	2	3	0	0	0	8	37
MQR-035	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-036	Monatiquot River	0	0	0	3	3	3	0	0	0	9	29
MQR-037	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-038	Monatiquot River	0	0	0	3	1	3	0	0	3	10	6
MQR-039	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-040	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-041	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-042	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-043	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-044	Monatiquot River	0	0	0	3	1	1	0	0	0	5	187
MQR-045	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-046	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-047	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-048	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-049	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48

Outfall ID	Receiving Water	Previous Screening Results Indicate Likely Sewer Input?[1]	Discharging to Area of Concern to Public Health?[2]	Frequency of Past Discharge Complaints[3]	Receiving Water Quality[4]	Density of Generating Sites[5]	Age of Development/ Infrastructure[6]	Historic Combined Sewers or Septic?[7]	Aging Septic?[8]	Culverted Streams?[9]	Score	Priority Ranking
MQR-050	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-051	Monatiquot River	0	0	0	3	1	3	0	0	3	10	6
MQR-052	Monatiquot River	0	0	0	3	1	2	0	0	0	6	184
MQR-053	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-054	Monatiquot River	0	0	0	3	1	2	0	0	0	6	184
MQR-055	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-056	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-057	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-058	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-059	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-060	Monatiquot River	0	0	0	3	3	3	0	0	0	9	29
MQR-061	Monatiquot River	0	0	0	3	2	3	0	0	0	8	37
MQR-062	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-063	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-064	Monatiquot River	0	0	0	3	2	3	0	0	0	8	37
MQR-065	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-066	Monatiquot River	0	0	0	3	2	3	0	0	0	8	37
MQR-067	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-068	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-069	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-070	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-071	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-072	Monatiquot River	0	0	0	3	2	3	0	0	0	8	37
MQR-073	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-074	Monatiquot River	0	0	0	3	1	3	0	0	3	10	6
MQR-075	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-076	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-077	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-078	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-079	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-080	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-081	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-082	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-083	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-084	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-085	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-086	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-087	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-088	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-089	Monatiquot River	0	0	0	3	2	3	0	0	0	8	37
MQR-090	Monatiquot River	0	0	0	3	2	3	0	0	0	8	37
MQR-091	Monatiquot River	0	0	0	3	2	3	0	0	0	8	37
MQR-092	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-094	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-095	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-096	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-097	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-098	Monatiquot River	0	0	0	3	2	3	0	0	0	8	37
MQR-099	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-101	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48

Outfall ID	Receiving Water	Previous Screening Results Indicate Likely Sewer Input?[1]	Discharging to Area of Concern to Public Health?[2]	Frequency of Past Discharge Complaints[3]	Receiving Water Quality[4]	Density of Generating Sites[5]	Age of Development/ Infrastructure[6]	Historic Combined Sewers or Septic?[7]	Aging Septic?[8]	Culverted Streams?[9]	Score	Priority Ranking
MQR-102	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-103	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-104	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-105	Monatiquot River	0	0	0	3	3	3	0	0	0	9	29
MQR-106	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-107	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-108	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-109	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-110	Monatiquot River	0	0	0	3	2	3	0	0	0	8	37
MQR-111	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
MQR-112	Monatiquot River	0	0	0	3	1	3	0	0	0	7	48
SMB-001	Smelt Brook	0	3	0	0	1	3	0	0	0	7	48
SMB-002	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-003	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-004	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-005	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-006	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-007	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-008	Smelt Brook	0	0	0	0	1	1	0	0	0	2	310
SMB-009	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-010	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-011	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-012	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-013	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-014	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-015	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-016	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-017	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-018	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-019	Smelt Brook	0	0	0	0	1	2	0	0	0	3	293
SMB-020	Smelt Brook	0	0	0	0	1	1	0	0	0	2	310
SMB-021	Smelt Brook	0	0	0	0	1	2	0	0	0	3	293
SMB-022	Smelt Brook	0	0	0	0	2	3	0	0	0	5	187
SMB-023	Smelt Brook	0	0	0	0	2	3	0	0	0	5	187
SMB-024	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-025	Smelt Brook	0	0	0	0	1	2	0	0	0	3	293
SMB-026	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-027	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-028	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-030	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-031	Smelt Brook	0	0	0	0	1	2	0	0	0	3	293
SMB-033	Smelt Brook	0	0	0	0	1	3	0	0	0	4	195
SMB-034	Smelt Brook	0	0	0	0	1	2	0	0	0	3	293
SSL-001	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48
SSL-002	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48
SSL-003	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48
SSL-004	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48
SSL-005	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48
SSL-006	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48
SSL-008	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48

Outfall ID	Receiving Water	Previous Screening Results Indicate Likely Sewer Input?[1]	Discharging to Area of Concern to Public Health?[2]	Frequency of Past Discharge Complaints[3]	Receiving Water Quality[4]	Density of Generating Sites[5]	Age of Development/ Infrastructure[6]	Historic Combined Sewers or Septic?[7]	Aging Septic?[8]	Culverted Streams?[9]	Score	Priority Ranking
SSL-010	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48
SSL-011	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48
SSL-012	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48
SSL-013	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48
SSL-014	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48
SSL-015	Sunset Lake	0	3	0	0	1	3	0	0	0	7	48
SSL-016	Sunset Lake	0	0	0	0	1	3	0	0	0	4	195
SSL-017	Sunset Lake	0	0	0	0	1	3	0	0	0	4	195
TWB-001	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-002	Town Brook	0	0	0	3	1	1	0	0	0	5	187
TWB-003	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-004	Town Brook	0	0	0	3	2	3	0	0	3	11	4
TWB-005	Town Brook	0	0	0	3	1	1	0	0	0	5	187
TWB-006	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-008	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-009	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-010	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-011	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-012	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-013	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-014	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-015	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-016	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-017	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-018	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-019	Town Brook	0	0	0	3	3	3	0	0	0	9	29
TWB-020	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-022	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-023	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-024	Town Brook	0	0	0	3	3	3	0	0	0	9	29
TWB-025	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-026	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-027	Town Brook	0	0	0	3	3	3	0	0	0	9	29
TWB-028	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-029	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-030	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-031	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-032	Town Brook	0	0	0	0	1	3	0	0	0	4	195
TWB-033	Town Brook	0	0	0	0	1	3	0	0	0	4	195
TWB-034	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-035	Town Brook	0	0	0	0	1	3	0	0	0	4	195
TWB-036	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-037	Town Brook	0	0	0	3	1	3	0	0	3	10	6
TWB-038	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-039	Town Brook	0	0	0	0	1	3	0	0	0	4	195
TWB-040	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-041	Town Brook	0	0	0	0	1	3	0	0	0	4	195
TWB-042	Town Brook	0	0	0	0	1	3	0	0	0	4	195
TWB-043	Town Brook	0	0	0	3	1	3	0	0	0	7	48
TWB-044	Town Brook	0	0	0	3	1	3	0	0	0	7	48

Outfall ID	Receiving Water	Previous Screening Results Indicate Likely Sewer Input?[1]	Discharging to Area of Concern to Public Health?[2]	Frequency of Past Discharge Complaints[3]	Receiving Water Quality[4]	Density of Generating Sites[5]	Age of Development/ Infrastructure[6]	Historic Combined Sewers or Septic?[7]	Aging Septic?[8]	Culverted Streams?[9]	Score	Priority Ranking
WFR-001	Weymouth Fore River	0	3	0	3	1	3	0	0	0	10	6
WFR-002	Weymouth Fore River	0	0	0	3	3	3	0	0	0	9	29
WFR-003	Weymouth Fore River	0	3	0	3	1	3	0	0	0	10	6
WFR-004	Weymouth Fore River	0	0	0	3	2	1	0	0	3	9	29
WFR-005	Weymouth Fore River	0	3	0	3	1	3	0	0	0	10	6
WFR-006	Weymouth Fore River	0	0	0	3	2	3	0	0	0	8	37
WFR-007	Weymouth Fore River	0	3	0	3	1	3	0	0	0	10	6
WFR-008	Weymouth Fore River	0	0	0	3	1	3	0	0	0	7	48
WFR-009	Weymouth Fore River	0	3	0	3	1	3	0	0	0	10	6
WFR-010	Weymouth Fore River	0	0	0	3	1	3	0	0	0	7	48
WFR-011	Weymouth Fore River	0	3	2	3	1	3	0	0	0	12	3
WFR-012	Weymouth Fore River	0	0	0	3	1	3	0	0	0	7	48
WFR-013	Weymouth Fore River	0	0	0	3	1	3	0	0	0	7	48
WFR-014	Weymouth Fore River	0	0	0	3	1	3	0	0	0	7	48
WFR-015	Weymouth Fore River	0	0	0	3	1	3	0	0	0	7	48
WFR-016	Weymouth Fore River	0	0	0	3	1	3	0	0	0	7	48
WFR-017	Weymouth Fore River	0	0	0	3	1	3	0	0	0	7	48
WFR-018	Weymouth Fore River	0	0	0	3	1	3	0	0	0	7	48

Scoring Criteria:

1. No=0, Yes=3. Outfalls that meet any of the following criteria are considered to likely have sewer input:
    - 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
    - Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine
2. No=0, Yes=3. Outfalls/interconnections that discharge to or in the vicinity of any of the following areas: public beaches, recreational areas, drinking water supplies, or shellfish beds.
3. None=0, Occasional=2, Frequent=3.
4. Good=0, Fair=2, Poor=3. Receiving water quality based on latest version of MassDEP Integrated List of Waters.
    - Poor = Waters with approved TMDLs (Category 4a Waters) where illicit discharges have the potential to contain the pollutant identified as the cause of the impairment
    - Fair = Water quality limited waterbodies that receive a discharge from the MS4 (Category 5 Waters)
    - Good = No water quality impairments
5. Low=1, Medium=2, High=3. Generating sites are institutional, municipal, commercial, or industrial sites with a potential to contribute to illicit discharges (e.g., car dealers, car washes, gas stations, garden centers, industrial manufacturing, etc.)
    - Low = The outfall catchment area did not contain land uses indicative of generating sites.
    - Medium = More than 0 but less than 10 percent of the outfall catchment area has land uses indicative of generating sites.
    - High = More than 10 percent of the outfall catchment area has land uses indicating of generating sites.
6. Low=1, Medium=2, High=3. Age of development and infrastructure:
    - High = Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old
    - Medium = Developments 20-40 years old
    - Low = Developments less than 20 years old
7. No=0, Yes=3. Areas that were once served by septic systems or combined sewer systems but have been converted to sanitary sewers.
8. No=0, Yes=3. Aging septic systems are septic systems 30 years or older in residential areas.
9. No=0, Yes=3. Any river or stream that is culverted for distance greater than a simple roadway crossing.

Appendix G: System Vulnerability Matrix

[Development of the System Vulnerability Matrix has not begun. The Matrix will be developed within the timeframe set by the MS4 Permit requirements.]

System Vulnerability Factors Matrix

Revision Date: xx/xx/xxxx

Outfall ID	Receiving Water	1 History of SSOs	2 Common or Twin Invert Manholes	3 Common Trench Construction	4 Storm/Sanitary Crossings (Sanitary Above)	5 Sanitary Lines with Underdrains	6 Inadequate Sanitary Level of Service	7 Areas Formerly Served by Combined Sewers	8 Sanitary Infrastructure Defects	9 SSO Potential In Event of System Failures	10 Sanitary and Storm Drain Infrastructure >40 years Old	11 Septic with Poor Soils or Water Table Separation	12 History of BOH Actions Addressing Septic Failure

Presence/Absence Evaluation Criteria:

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
- Common or twin-invert manholes serving storm and sanitary sewer alignments
- Common trench construction serving both storm and sanitary sewer alignments
- Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system
- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system
- Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints
- Areas formerly served by combined sewer systems
- Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations
- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs
- Any sanitary sewer and storm drain infrastructure greater than 40 years old
- Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather that poor owner maintenance)
- History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather that poor owner maintenance)

Appendix H: IDDE Program Support Documents

Illicit Discharge Detection and Elimination (IDDE)
IDDE Program Supporting Data and Documents
Town of Braintree
June 2019

Type of Data or Document	Document Title/Description of Data	Location of Document/Data	Publication Date	Notes
Drainage Mapping	Drainage with Catchment Boundaries	https://braintreema.gov/DocumentCenter/View/4302/Drainage-with-Catchment-Boundaries-Map?bidId=	June 21, 2019	
Ordinance	Town of Braintree Stormwater Management Ordinance	https://braintreema.gov/847/Ordinance-Regulations	May 29, 2018	
Regulations	Town of Braintree Stormwater Regulations	https://braintreema.gov/847/Ordinance-Regulations	June 24, 2019	
Stormwater Work Log	Drainage Work Log	https://braintreema.gov/852/Municipal-Separate-Storm-Sewer-System-MS	June 27, 2019	

Appendix I: SSO Inventory

SSO INVENTORY - TOWN OF BRAINTREE
JAN. 2014 - MAY 2019

SSO Location	Discharge Statement	Date	Time Start	Time End	Estimated Volume (gallons)	Description	Mitigation Completed	Mitigation Planned
2014								
44 Allen Street, at rear of building	Pumped from SMH directly to Monatiquot River	3/30/2014 to 4/1/14	11:30 AM	9:30 AM	3,312,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
Jay St. - easement at end of cul-de-sac	Pumped from SMH into wetland resource area upstream of Monatiquot River	3/30/14 to 4/1/14	12:00 PM	8:00 PM	720,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
660 Union St., Trotters Green residential complex	Pumped from SMH to CB that discharges to Monatiquot River	3/30/14 to 4/1/14	11:00 AM	9:00 AM	759,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
Arnold St. at Adams St., SE corner	Pumped directly to Monatiquot River	12/9/2019 to 12/11/14	4:00 PM	12:00 AM	1,536,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
Jay St. - easement at end of cul-de-sac	Pumped from SMH into wetland resource area upstream of Monatiquot River	12/9/14 to 12/11/14	3:00 PM	9:00 AM	945,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
660 Union St., Trotters Green residential complex	Pumped from SMH to CB that discharges to Monatiquot River	12/9/14 to 12/11/14	3:30 PM	9:30 AM	630,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
2015								
44 Allen St. at rear of building	Pumped from SMH directly to Monatiquot River	3/27/15 to 3/28/15	3:00 AM	11:00 PM	3,168,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue

SSO INVENTORY - TOWN OF BRAINTREE
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Jay St. - easement at end of cul-de-sac	Pumped from SMH into wetland resource area upstream of Monatiquot River	3/27/15 to 3/28/15	4:00 AM	4:00 PM	504,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
660 Union St., Trotters Green residential complex	Pumped from SMH to CB that discharges to Monatiquot River	3/26/15 to 3/28/15	11:00 PM	6:00 AM	651,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
2016								
No SSO incidents								
2017								
44 Allen St. at rear of building	Pumped from SMH directly to Monatiquot River	4/1/17 to 4/3/17	12:00 PM	7:00 AM	3,870,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
Arnold St. at Adams St., SE corner	Directly to Monatiquot River	4/1/17 to 4/2/17	1:00 PM	1:00 AM	720,000	Heavy rain and snowmelt causing surcharging sewer manholes		MWRA I&I issue
Jay St. - easement at end of cul-de-sac	Pumped from SMH into wetland resource area upstream of Monatiquot River	4/1/17 to 4/2/17	2:00 PM	2:00 AM	270,000	Heavy rain and snowmelt causing surcharging sewer manholes		MWRA I&I issue
660 Union St., Trotters Green residential complex	Pumped from SMH to CB that discharges to Monatiquot River	4/1/17 to 4/2/17	12:00 PM	12:00 AM	396,000	Heavy rain and snowmelt causing surcharging sewer manholes		MWRA I&I issue
80 Common St. pump station	Pumped directly to Town Brook	4/1/2017	5:00 PM	10:00 PM	112,500	Heavy rain and snowmelt causing surcharging sewer manholes		MWRA I&I issue
2018								

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Nickerson Rd. between #29 & #35	Pumped from SMH to CB (MS4) eventually to the Monatiquot River	1/13/2018	9:00 AM	6:00 PM	162,000	Heavy rain and snowmelt causing surcharging sewer manholes		MWRA I&I issue
Jay St. - easement at end of cul-de-sac	Pumped from SMH into wetland resource area upstream of Monatiquot River	1/13/2018	2:00 AM	7:00 PM	306,000	Heavy rain event and snowmelt causing surcharging sewer manholes		MWRA I&I issue
44 Allen St. at rear of building	Pumped from SMH directly to Monatiquot River	1/13/18 to 1/14/18	1:00AM	6:00 AM	2,610,000	Heavy rain event and snowmelt causing surcharging sewer manholes		MWRA I&I issue
660 Union St., Trotters Green residential complex	Pumped from SMH to CB that discharges to Monatiquot River	1/13/18 to 1/14/18	2:00 AM	1:00AM	414,000	Heavy rain event and snowmelt causing surcharging sewer manholes		Heavy rain event causing surcharging sewer manholes
Arnold St. at Adams St., SE corner	Directly to Monatiquot River	1/13/2018	10:30 AM	2:00 PM	288,000	Heavy rain event and snowmelt causing surcharging sewer manholes		MWRA I&I issue
44 Allen St. at rear of building	Pumped from SMH directly to Monatiquot River	3/2/18 to 3/4/18	3:00 PM	6:00 AM	3,510,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
Jay St. - easement at end of cul-de-sac	Pumped from SMH into wetland resource area upstream of Monatiquot River	3/2/18 to 3/3/18	2:00 PM	6:00 AM	336,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
Arnold St. at Adams St., SE corner	Directly to Monatiquot River	3/2/18 to 3/3/18	3:00 PM	1:00 AM	720,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue

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660 Union St., Trotters Green residential complex	Pumped from SMH to CB that discharges to Monatiquot River	3/2/18 to 3/3/18	4:30 PM	4:30 AM	216,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
167 Howard St., pump station	Force main break - direct discharge to Hayward Creek	11/3/2018 to 11/4/18	2:30 PM	12:30 AM	210,000	Emergency by-pass pumping, heavy storm event	Force main replaced	
Farm River Pump Station between #80 & #90 Barstow Dr.	Directly to the Farm River	11/10/2018	3:45 AM	4:45 AM	1,800	Heavy rain event causing surcharging sewer manholes		By-pass pumped with 3" pump @ 300 GPM in order to reduce residential backups
44 Allen St. at rear of building	Pumped from SMH directly to Monatiquot River	11/10/18 to 11/11/18	7:00 AM	6:00 AM	1,035,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
Jay St. - easement at end of cul-de-sac	Pumped from SMH into wetland resource area upstream of Monatiquot River	11/10/2018	5:30 AM	9:30 PM	288,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
44 Allen St. at rear of building	Pumped from SMH directly to Monatiquot River	11/16/17 to 11/17/18	11:00 AM	7:00 AM	360,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue
2019								
44 Allen St. at rear of building	Pumped from SMH directly to Monatiquot River	4/23/19 to 4/24 19	12:30 AM	4:30 AM	2,016,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue

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Jay St. - easement at end of cul-de-sac	Pumped from SMH into wetland resource area upstream of Monatiquot River	4/23/2019	12:45 AM	11:45 AM	213,000	Heavy rain event causing surcharging sewer manholes		MWRA I&I issue