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SUPPLEMENTAL STORMWATER MANAGEMENT PLAN

MS4 GENERAL PERMIT COMPLIANCE

2024 UPDATE

CITY OF
Revere
MASSACHUSETTS

swmp

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CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name Nicholas Rystrom

Signature NJ Rystrom Date 5/13/25

1.0 INTRODUCTION / OVERVIEW

1.1 Regulatory Summary and Purpose

The Federal Water Pollution Control Act (WPCA), initially enacted in 1948, established ambient water quality standards to specify acceptable levels of pollution in lieu of preventing the causes of water pollution. The 1972 amendments to the WPCA, referred to as the Clean Water Act (CWA), implemented measures which were focused on establishing effluent limitations on point sources, or 'any discernable, confined, and discrete conveyance… from which pollutants are or may be discharged."

The 1972 CWA introduced the National Pollutant Discharge Elimination System (NPDES). The NPDES program was established as the fundamental regulatory mechanism of the CWA, requiring direct dischargers of pollutants into waters of the United States to obtain a NPDES permit. Between 1972 and 1987, the NPDES permit program focused on improving surface water quality by reducing pollutants of industrial process wastewater and municipal sewage. During this period, several nationwide studies on water quality, most notably the United States Environmental Protection Agency (EPA) National Urban Runoff Plan (NURP), identified stormwater discharges as a significant source of water pollution.

The results of the NURP and similar studies, resulted in the reauthorization of the CWA in 1987 with the passage of the Water Quality Act (WQA). The WQA established a legal framework and required EPA to develop a comprehensive phased program for regulating municipal and industrial stormwater discharges under the NPDES permit program.

The NPDES Phase 1 Rule, which was issued in November 1990, addressed stormwater dischargers from medium to large municipal separate storm sewer systems (MS4s), which were communities serving a population of at least 100,000 people, as well as stormwater discharges from 11 categories of industrial activity.

The NPDES Phase 2 Rule, which was promulgated in December 1999, addressed small MS4s serving a population of less than 100,000 people in urbanized areas. The Phase 2 Rule requires nationwide coverage of all operators of small MS4s that are located within the boundaries of the Bureau of the Census-defined "urbanized area" (UA) based on the latest decennial census. The Phase 2 rule requires that all MS4s located within "urbanized areas" automatically comply with the Phase 2 stormwater regulations. Appendix B of this report provides a map of the Phase II stormwater "permit compliance area" for Revere as determined by the USEPA using the latest decennial (year 2010) census. Since Revere is located within an urbanized area, the EPA has designated the City of Revere as a Phase 2 Community, which must comply with the NPDES regulations. In the Commonwealth of Massachusetts, the EPA retains primacy as the Phase 2 permitting authority. On May 1, 2003, the EPA and the Massachusetts Department of Environmental Protection (MADEP) jointly issued the NPDES General Permit for Discharges from Small MS4s and in July 2003, Revere submitted the required Notice of Intent (NOI) for inclusion under this General Permit.

The 2003 NPDES Phase 2 MS4 General Permit (2003 MS4 Permit) required the City of Revere to develop, implement, and enforce a Stormwater Management Program (SWMP). The objectives of the

SWMP were to reduce the discharge of pollutants from the MS4 to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the CWA. The City of Revere has an existing *2013 Comprehensive Wastewater and Stormwater Management Plan, and a supplemental 2019 Stormwater Management Plan. These* documents are available for viewing upon request from the City Engineering Department.

This Stormwater Management Plan will serve as an update to the 2019 Stormwater Management Plan, and specifically satisfy the requirements set forth by the NPDES Phase 2 regulations which expanded Phase 1's efforts to preserve, protect, and improve the nation's water resources from polluted stormwater runoff to include additional operators of "traditional" (i.e. cities and town's) and "non-traditional" (i.e. Federal and state agencies) MS4s. The 2003 MS4 Permit expired on May 1, 2008, but was administratively continued for covered permittees until a new MS4 Permit was issued on April 4, 2016, and became effective on July 1, 2018. A copy of the 2016 MS4 Permit is included in Appendix C. On October 1, 2018, the City submitted a Notice of Intent to EPA to obtain coverage under the 2016 MS4 Permit. A copy of this Notice of Intent is included in Appendix D. EPA posted the City's Notice of Intent for public comment on February 1, 2019 for a 30-day period. The City received authorization from EPA to discharge under the 2016 MS4 Permit on March 5, 2019. A copy of the City's Authorization to Discharge is included in Appendix D.

See the ***2013 Comprehensive Wastewater and Stormwater Management Plan*** , Section 3.2.4 NPDES Permit (page 3-20).

CONSENT DECREES

See ***2013 Comprehensive Wastewater and Stormwater Management Plan*** , Appendix A – Consent Decree of the City of Revere, Massachusetts.

1.2 Responsible Parties

The City of Revere has a City Council form of government. The legislative power of the City is vested in a City Council. The mayor preforms such duties that are set forth in the Charter and under the General Laws or as prescribed by the provisions of the revision of the ordinances adopted by the City Council. The Public Works Superintendent is responsible for street cleaning, collection of rubbish, and performing all other services properly connected with the public works department as may be required by the mayor or the City Council.

Various entities within the City have the responsibility for implementation of the MS4 Permit requirements as outlined in this plan and include the following:

- Engineering
- Department of Public Works
- Department of Planning and Community Development
- Building Department
- Inspectional Services Department

Specific representatives from each of these departments or committees that are responsible for implementation of the SWMP are outlined in the table below:

Table 1.1 PARTIES RESPONSIBLE FOR SWMP IMPLEMENTATION		
Name	Title	Affiliation
Nicholas Rystrom, P.E.	City Engineer	Engineering Department
Michael Hinojosa	Director of Parks and Recreation	Park and Recreation
Chris Ciaramella	Superintendent of Public Works; Chief of Infrastructure	DPW, Sewer, Water, and Drain
Tom Skwierawski	Chief of Planning and Community Development	Department of Planning and Community Development
Richard Dicks	Senior Building Inspector	Building Department
Michael Wells	Director of Municipal Inspections & Health Agent	Inspectional Services Department

1.3 City Demographic Information

See the *2013 Comprehensive Wastewater and Stormwater Management Plan* , Section 2.2, Physical Characteristics (page 2-1).

See the *2013 Comprehensive Wastewater and Stormwater Management Plan* , Section 2.2.3, Topography (page 2-4).

See the *2013 Comprehensive Wastewater and Stormwater Management Plan* , Section 2.4.4, Community Demographics (page 2-19).

1.4 Impaired Waters

See the *2013 Comprehensive Wastewater and Stormwater Management Plan* , Section 2.3.1, Major Watersheds and 2.3.2 Water Resources (page 2-4).

The Final 2022 Integrated List of Waters included the addition of Enterococcus to Segment MA71-14 of the Belle Isle Inlet and Segment MA71-08 of Mill Creek. All impairments according to the Final Massachusetts Integrated List of Waters for the Clean Water Act 2022 and outfalls discharging to these water bodies are summarized in Table 1.2 below:

Table 1.2 RECEIVING WATERS AND IMPAIRMENTS		
Waterbody	Impairment	Number of Outfalls Discharging to Receiving Water
Belle Isle Inlet (MA71-14) – From tidegate at Bennington Street, Boston/Revere to confluence with Winthrop Bay, Boston/Winthrop *(Class SA Water)*	Fecal Coliform*, Cause Unknown (Contaminants in Fish and/or Shellfish), PCB in Fish Tissue, Enterococcus*	3
Belle Isle Inlet (Tributary Waters)	N/A	2
Mill Creek (MA71-08)- From Route 1, Chelsea/Revere to confluence with Chelsea River, Chelsea/Revere. *(Class SA Water)*	Fecal Coliform*, Cause Unknown (Contaminants in Fish and/or Shellfish), PCB in Fish Tissue, Enterococcus*	4
Mill Creek (Tributary Waters)	N/A	4
Pines River (MA93-15) – Headwaters east of Rt. 1, Revere/Saugus to confluence with the Saugus River, Saugus/Revere.	Fecal Coliform*	17
Pines River (Tributary Waters)	N/A	8
Saugus River (MA93-44)- Avenue/Boston Street, Saugus/Lynn to mouth (east of Route 1A) at Lynn Harbor, Lynn/Revere (formerly part of segment 93-14)	(Flow Regime Modification), Enterrococcus*, Fecal Coliform*, Oil and Grease, Temperature	1
Town Line Brook (MA93-51)- Unnamed tributary locally known as “Town Line Brook”, the Route 99 Malden to the confluence with the Pines River, Revere	(Alteration in stream-side or littoral vegetative covers), (Debris), (flow regime modifications), (Physical substrate habitat alterations), Fecal Coliform*, Odor, Trash	5
Town Line Brook (Tributary Waters)	N/A	10
Diamond Creek	N/A	2

Table 1.2 RECEIVING WATERS AND IMPAIRMENTS		
Waterbody	Impairment	Number of Outfalls Discharging to Receiving Water
Diamond Creek (Tributary Waters)	N/A	25
Sales Creek (MA71-12) – Headwaters neat Route 145, Revere to tidegate/confluence with Belle Isle Inlet, Boston/Revere	N/A	14
Sales Creek (Tributary Waters)	N/A	1

* Impairments with a TMDL

1.5 Interconnections

The City of Revere currently has no documented interconnections that have been confirmed in the field where its MS4 discharges to, or receives flow from, the MS4 of another municipality or a state entity (i.e. MassDOT or DCR). During Permit Year 6, the City identified several potential interconnection locations. Field investigations to verify these interconnections are planned for Permit Year 7. Verified interconnections will be added to the City's outfall and interconnection inventory and incorporated into the City's mapping.

1.6 Endangered Species and Historic Properties Determination

The 2016 MS4 Permit requires Revere to demonstrate that all activities regulated under this permit will not adversely affect endangered and threatened species or critical habitat, or impact federal historic properties on the National Register of Historic Properties (NRHP). The City must demonstrate that there is no critical habitat for any endangered species within its boundaries, and if such a habitat exists, that no best management practice shall interfere with that habitat. Revere must also certify that no discharge will affect a property that is listed or eligible for listing on the NRHP, that any such effects have written acknowledgements from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), or other representative that such effects shall be mitigated, and written proof that any best management practices constructed under this permit will include measures to minimize harmful effects on these properties. A copy of the letter from United States Fish and Wildlife Services regarding the endangered species is included in Appendix D.

See the ***2013 Comprehensive Wastewater and Stormwater Management Plan*** , Section 2.3.5, Rare and Sensitive Habitats (page 2-8).

See the ***2013 Comprehensive Wastewater and Stormwater Management Plan*** , Section 2.3.6, Historical and Archaeological Resources (page 2-1).

1.7 Increased Discharges

Any increased discharges (including increased pollutant loadings) through the MS4 to waters of the United States are subject to Massachusetts antidegradation regulations at 314 CMR 4.04. Section 2.1.2 of the 2016 MS4 Permit requires the City of Revere to comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for increased discharges where appropriate. Any authorization by MassDEP for an increased discharge is required to be incorporated into this SWMP.

The City understands that there shall be no increased discharges, including increased pollutant loadings, from the MS4 to impaired waters listed in categories 5 or 4b on the most recent Massachusetts Integrated Report of Waters listed pursuant to Clean Water Act section 303(d) and 305(b) unless the City demonstrates that there is no net increase in loading from the MS4 to the impaired water of the pollutant(s) for which the waterbody is impaired. If necessary, the City of Revere will demonstrate compliance with this provision by either:

- Documenting that the pollutant(s) for which the waterbody is impaired is not present in the MS4's discharge and retaining documentation of this finding with the SWMP; or

- Documenting that the total load of the pollutant(s) of concern from the MS4 to any impaired portion of the receiving water will not increase as a result of the activity and retain documentation of this finding in the SWMP. Unless otherwise determined by the Permittee, USEPA or by MADEP that additional demonstration is necessary, compliance with the requirements of Part 2.2.2 and Part 2.3.6 of this permit, including all reporting and documentation requirements, shall be considered as demonstrating no net increase as required by this part.

1.8 Surface Water Drinking Supplies

Section 3.0 of the MS4 Permit requires permittees to prioritize discharges to public drinking water supply sources in implementation of the SWMP. The City does not have any discharges to surface drinking water supply sources or their tributaries.

2.0 MINIMUM CONTROL MEASURES

2.1 Introduction

This section of the Plan provides a summary of the regulatory requirements for each of the six minimum control measures as defined under the MS4 General Permit by the EPA. It also provides a summary of those stormwater management practices that the City currently employs. As part of the requirements of the Notice of Intent submitted to EPA on October 1, 2018 and supplemented on November 21, 2018, as included in Appendix D, the City has established a list of the Best Management Practices (BMPs) that it plans to implement in order to comply with each of the six minimum control measures. These BMPs will be implemented over the permit term. However, the City will have up to 10 years to implement some of the permit requirements as indicated. The City's progress with respect to implementation of the BMPs, and other stormwater related activities, are summarized in annual reports submitted to EPA in accordance with the MS4 Permit. Under the 2003 MS4 Permit, the City made significant progress in compliance with many of the elements now required by the 2016 MS4 Permit. The City of Revere submitted 13 annual reports to EPA, in compliance with the 2003 MS4 Permit, between 2004 and 2018. Links to these reports are included in Appendix E.

The Best Management Practices (BMPs) selected for each minimum control measure are summarized and briefly described in this section. Specific details for each BMP including measurable goals, implementation dates and individuals responsible for implementation are stated in each of the respective sections for each control measure in this plan. The City Engineer, the Department of Public Works, Building Inspector, Community Development and Planning, and the Inspectional Services Department will be responsible for implementation and/or future enforcement of each of the BMPs for the six minimum control measures.

Compliance with requirements of the permit related to water quality limited waters and approved TMDLs is included in Section 6.

Checklists outlining requirements for Permit Years 1 through 6 are included in Appendix F.

2.2 Permit Requirements and Implementation Timeframes

2.2.1 MCM #1 - Public Education and Outreach

The public education and outreach minimum control measure requires the City to make educational information available to the public and other stakeholders specified by the permit. Revere has been participating in public education and outreach activities since the 2003 MS4 Permit was enacted and continues to expand upon those activities under the 2016 MS4 Permit, as detailed below.

Regulatory Requirement:

Section 2.3.2 of the 2016 MS4 General Permit requires permittees to "implement an education program that includes educational goals based on stormwater issues of significance within the MS4 area. The ultimate objective of a public education program is to increase knowledge and change behavior of the public so that pollutants in stormwater are reduced."

Existing City Practices:

Since the 2003 MS4 Permit became effective, the City of Revere has implemented several public education initiatives. It has collaborated with local schools to incorporate stormwater into local curricula, K-12. The program was initiated with the school department and Saugus River Watershed Council. The DPW has distributed household/commercial brochures and fact sheets and provided these materials on the City's website. The City of Revere will continue to implement a variety of public education measures.

In addition to the work being performed by the City at present, this new iteration of the permit requires additional public education measures. Revere must distribute two targeted messages within five years to the following audiences, spaced at least one year apart for each audience:

1. Residents
2. Businesses, Institutions and Commercial Facilities
3. Developers (Construction)
4. Industrial Facilities

In order to accomplish this, the City will implement the following BMPs:

BMP: Dog Waste Flyer
Description: Dog waste flyer included with dog licenses, encouraging owners to properly dispose of their pets' waste.
Targeted Audiences: Residents
Responsible Department/Parties: Engineering/ External Contractor
Measurable Goals: Track number of flyers distributed
Message Dates: Completed during Permit Year 2 (FY2020) and continued annually. In Permit Year 6, 1,847 dog owners received a flyer with their dog license renewal mailing.

BMP: Scoop the Poop Flyer
Description: Dog waste flyer posted to the City's website encouraging homeowners to properly dispose of their pet's waste.
Targeted Audiences: Residents
Responsible Department/Parties: Engineering/ External Contractor
Measurable Goals: Track views
Message Dates: Maintained on the City's website through Permit Year 6.

BMP: Think Blue Massachusetts
Description: Share Think Blue Massachusetts' campaign video on City website page. The video encourages residents to be mindful about how pollutants from their property may affect stormwater runoff and local water quality.
Targeted Audiences: Developers (Contractors), Residents, Businesses, Institutions
Responsible Department/Parties: Engineering/ External Contractor
Measurable Goals: Track views
Message Dates: Completed during Permit Year 2 (FY2020) and maintained on the City's website through Permit Year 6 (FY2024).

BMP: Bag Your Leaves
Description: The City posted an educational message about the importance of bagging leaves to prevent blocked storm drains and water pollution to the City's website.
Targeted Audiences: Residents
Responsible Department/Parties: Engineering/ External Contractor
Measurable Goals: Track views/visits to page
Message Dates: Completed during Permit Year 3 (FY2021) and maintained on the City's website through Permit Year 6 (FY2024).

BMP: Stormwater Pollution Educational Video
Description: Stormwater Pollution Education Video posted to website/social media with a link to information from the Mystic River Watershed Association, including information about how impervious surfaces can impact water quality.
Targeted Audiences: Residents
Responsible Department/Parties: Engineering/External Contractor
Measurable Goals: Track views and viewership
Message Dates: Completed during Permit Year 2 (FY2020) and Permit Year 5 (FY2023).

BMP: Salt and De-icer Social Media Post
Description: Salt and De-icer
Targeted Audiences: Residents
Responsible Department/Parties: Engineering
Measurable Goals: Track views/visits to page
Message Dates: Completed during Permit Year 4 (FY2022).

BMP: Fertilizer Social Media Post
Description: Proper use of fertilizer
Targeted Audiences: Residents
Responsible Department/Parties: Engineering/ External Contractor
Measurable Goals: Track View
Message Dates: Completed during Permit Year 2 (FY2020) and 3 (FY2021).

BMP: Parking Lot Management Press release/Social Media
Description: Proper management of private parking lots
Targeted Audiences: Businesses, institutions and commercial facilities
Responsible Department/Parties: Engineering/ External Contractor
Measurable Goals: Track Views and readership
Message Dates: Completed during Permit Year 2 (FY2020).

BMP: Diamond Creek MVP Resources
Description: On the Engineering page of the City's website, there is an informational section about the Diamond Creek MVP Project. This project will feature nature-based solutions and green stormwater infrastructure within the Diamond Creek catchment area. The website includes links to a brochure, survey QR code, and comprehensive project StoryMap, with information about the purpose of the project, potential nature-based solutions, and interactive flood projection maps.
Target Audience: Residents
Responsible Department/Parties: Engineering/External Contractor
Measurable Goals: Track number of survey responses

Message Dates: Completed during Permit Year 5 (FY2023) and updated throughout Permit Year 6 (FY2024).

BMP: Stormwater Proofing Your Dumpster
Description: The City of Revere created a graphic about steps to stormwater proof dumpsters and posted it to the City Facebook page. The graphic explains that simple steps can be taken to prevent trash from entering the local waterways, and protect local water quality.
Targeted Audiences: Residents
Responsible Department/Parties: Engineering/External Contractor
Measurable Goals: Track views
Message Dates: Completed during Permit Year 5 (FY2023).

Public education materials utilized in the implementation of the City's SWMP are included in Appendix G.

2.2.2 Public Involvement / Participation

Regulatory Requirement:

Section 2.3.3 of the 2016 MS4 Permit requires the permittee to "provide opportunities to engage the public to participate in the review and implementation of the permittee's SWMP." Public participation benefits the program by increasing public support, including additional expertise and involving community groups/organizations.

Existing City Practices:

The City of Revere has been proactive in providing opportunities for public participation and involvement in stormwater management practices.

The DPW supports volunteers in holding an annual City Wide Clean Up event to clean up trash/debris from City streets and properties. The Conservation Commission holds at least two stake holder meetings with separate watershed communities (Mystic River, Saugus River, and Belle Isle).

In addition to the above practices, the City allows for public review of this stormwater management plan by posting on the City's website. These BMPs and others that the City has committed to are detailed below.

BMP: SWMP Public Review
Description: SWMP Review
Responsible Department/Parties: Engineering
Measurable Goals: Allow annual review of stormwater management plan and posting of stormwater management plan on website.
Message Dates: Implemented during Permit Year 1 (FY2019) and continued annually. The SWMP is always available to the public on the City's website.

BMP: SWMP Public Participation
Description: SWMP Annual Public Comment Period
Responsible Department/Parties: Engineering

Measurable Goals: Allow public to comment on stormwater management plan annually.
Message Dates: Implemented during Permit Year 1 (FY2019) and continued annually. The SWMP is always available to the public on the City's website.

BMP: Public Participation
Description: Hold Annual Household Hazardous Waste Day (HHWD)
Responsible Department/Parties: DPW Operations
Measurable Goals: Hold Annual HHWD
Message Dates: Implemented during Permit Year 1 (FY2019) and continued annually through Permit Year 6 (FY2024).

BMP: Public Participation
Description: Stormwater Stenciling/ Plaques
Responsible Department/Parties: DPW Operations
Measurable Goals: Install 50 Per year
Message Dates: 300 installed during Permit Year 1 (FY2019).

BMP: Diamond Creek Public Workshop
Description: Diamond Creek Catchment Improvements Investigation and Assessment Project Public Workshop. The City hosted a public workshop to inform residents about the impacts of climate change on storm events and flooding in Revere. A flyer advertising the event was posted to the City's website in five languages.
Responsible Department/Parties: Engineering
Measurable Goals: Allow public to comment on the Diamond Creek Project
Message Dates: Completed during Permit Year 5 (FY2023and Permit Year 6 (FY2024).

BMP: Diamond Creek Tabling Event
Description: Tabling event at the Annual Revere Beach Kite Festival. Attendees had the opportunity to learn about, ask questions, and provide feedback on the Diamond Creek Catchment Improvements Investigation and Assessment Project. Attendees could also participate in an activity demonstrating the impact of increasing storm intensity on local beaches. A flyer advertising the event was posted to the City website in five languages.
Responsible Department/Parties: Engineering
Measurable Goals: Allow public to comment on the Diamond Creek Project
Message Dates: Completed during Permit Year 5 (FY2023) and Permit Year 6 (FY2024).

2.2.3 Illicit Discharge Detection and Elimination

Regulatory Requirement:

Section 2.3.4 of the 2016 MS4 General Permit requires the permittee to develop a written Illicit Discharge Detection and Elimination (IDDE) program. The IDDE program is designed to "systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges."

Existing City Practices:

See the *2013 Comprehensive Wastewater and Stormwater Management Plan* , 3.2.1 IDDE Activities (page 3-14 and 3-16).

These permit requirements can be achieved through implementation of the following BMPs:

BMP: SSO Inventory
Description: Develop a Sanitary Sewer Overflows (SSO) inventory in accordance with permit conditions.
Responsible Department/Parties: DPW Operations / Engineering
Measurable Goals: Complete within 1 year of effective date of permit
Message Dates: Completed prior to Permit Year 1 (FY2019) and updated annually.

BMP: Storm Sewer System Map
Description: Create map and update during IDDE program completion
Responsible Department/Parties: Engineering
Measurable Goals: Update map within 2 years of effective date of permit and complete full system map 10 years after effective date of permit
Message Dates: Completed prior to Permit Year 1 (FY2019) and updated annually.

BMP: Written IDDE Program
Description: Create written IDDE program
Responsible Department/Parties: External Contractor
Measurable Goals: Complete within 1 year of the effective date of permit and update as required.
Message Dates: Completed prior to Permit Year 1 (FY2019) and updated annually.

BMP: Implement IDDE Program
Description: Implement catchment investigations according to program and permit conditions.
Responsible Department/Parties: Engineering/ External Contractor
Measurable Goals: Complete 10 years after effective date of permit
Message Dates: Completed prior to Permit Year 1 (FY2019) and implemented annually.

BMP: Employee Training
Description: Train employees on IDDE implementation.
Responsible Department/Parties: Engineering/ External Contractor
Measurable Goals: Train annually
Message Dates: Completed during Permit Year 3 (FY2021) and continued annually through Permit Year 6 (FY2024).

BMP: Conduct Dry Weather Screening
Description: Continue to conduct dry weather screening and sampling procedures in accordance with permit conditions.
Responsible Department/Parties: External Contractor
Measurable Goals: Complete 3 years after effective date of permit
Message Dates: Completed prior to Permit Year 1 (FY2019) and continued annually through Permit Year 6 (FY2024).

BMP: Conduct Wet Weather Screening
Description: Continue to conduct Wet Weather Screening in accordance with outfall screening procedure and permit conditions.
Responsible Department/Parties: External Contractor
Measurable Goals: Less than 24 hours after a rain event, visit any outfall determined to require additional screening (i.e. any outfall that has one or more system vulnerability factors) and obtain samples of any flow that is present and send to an external laboratory to be tested for any indicators.
Message Dates: Completed prior to Permit Year 1 (FY2019) and continued annually through Permit Year 6 (FY2024).

BMP: Ongoing Screening
Description: Conduct Dry and Wet weather screening (as necessary).
Responsible Department/Parties: External Contractor
Measurable Goals: Complete ongoing outfall screening upon completion of IDDE program implementation.
Message Dates: Completed prior to Permit Year 1 (FY2019) and continued annually.

BMP: Catchment Investigation Procedures
Description: Develop written catchment investigation procedures and incorporate into the IDDE Plan.
Responsible Department/Parties: DPW
Measurable Goals: Amend written IDDE Plan as needed with catchment investigation procedures.
Message Dates: Completed prior to Permit Year 1 (FY2019) and updated annually.

BMP: Catchment Investigations
Description: Investigate catchments with 1 or more System Vulnerability Factors (SVFs) per permit
Responsible Department/Parties: External Contractor
Measurable Goals: Investigate catchments with 1 or more SVF
Message Dates: Completed prior to Permit Year 1 (FY2019) and updated annually.

BMP: Continue to Update GIS
Description: Update GIS Mapping as new structures are found in the field or as errors are identified
Responsible Department/Parties: DPW Construction & Operations / Engineering / External Contractor
Measurable Goals: Reduction in errors identified in the field
Message Dates: Completed prior to Permit Year 1 (FY2019) and updated annually.

2.2.4 Construction Site Stormwater Runoff Control

Regulatory Requirement:

Section 2.3.5 of the 2016 MS4 Permit requires the permittee to create a program to "minimize or eliminate erosion and maintain sediment on site so that it is not transported in stormwater and allowed to discharge to a water of the US through the permittee's MS4." The permittee will conduct site plan reviews, site inspections, and include procedures for public involvement.

Existing City Practices:

Revere has a comprehensive Erosion and Sediment Control Ordinance enacted before the 2016 MS4 permit. This ordinance requires a Stormwater Management and Erosion Control Permit for the following activities which meet or exceed the following thresholds: any change of existing grade of more than two thousand five hundred square feet or twenty-five percent of the lot whichever is smaller; Removal of existing vegetation of more than two thousand five hundred square feet or twenty-five percent of the lot whichever is smaller; Storage of more than one hundred cubic yards of excavate or fill.

The City of Revere has been proactive about listening to public comments and complaints about the effectiveness of active construction sites' erosion and sediment control practices and will continue to monitor any input received.

To attain compliance with the 2016 MS4 Permit, the City will implement the following BMPs to supplement the guidelines set forth in their Erosion and Sediment Control Ordinance.

BMP: Site Inspection and Enforcement of Erosion and Sediment Control (ESC) Measures
Description: Complete written procedures of site inspections and enforcement procedures
Responsible Department/Parties: Engineering/Planning/DPW Operations
Measurable Goals: Continue to enforce erosion and sediment control measures and report on the number of site plan reviews, inspections and enforcements that occur annually.
Message Dates: Completed within 1 year of the effective date of the permit (FY2019). ESC inspection and enforcement measures are documented in the City's ESC code.

BMP: Site Plan Review
Description: Complete written procedures of site plan review and begin implementation
Responsible Department/Parties: Engineering/Planning/DPW Operations
Measurable Goals: Implement site plan review procedures and report on the number of site plans reviewed annually.
Message Dates: Completed within 1 year of the effective date of the permit (FY2019). The City's site plan review procedures are documented in the City's Site Plan Review code.

BMP: Erosion and Sediment Control
Description: Adoption of requirements for construction operators to implement a sediment and erosion control program.
Responsible Department/Parties: Engineering/Planning Board/ DPW Operations/Conservation Commission
Measurable Goals: Enforce existing sediment and erosion control requirements, and update regulations as needed.
Message Dates: Updated within 1 year and enforced every year after the permit effective date (FY2019). ESC adoption requirements are documented in the City's ESC code.

BMP: Waste Control
Description: Adoption of requirements to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary waste
Responsible Department/Parties: Engineering/ Planning

Measurable Goals: Update requirements to include control of wastes as needed within one year of the permit effective date.
Message Dates: To be completed during the first year after the effective permit date (FY2019).

2.2.5 Post-Construction Stormwater Management

Regulatory Requirement:

Section 2.3.6 of the 2016 MS4 Permit requires the permittee to require developers to "reduce the discharge of pollutants found in stormwater through the retention or treatment of stormwater after construction on new or redeveloped sites."

In this case, a site is defined as the "area extent of construction activities which includes but is not limited to the creation of new impervious cover and improvement of existing impervious cover."

New Development is defined as construction activity that results in a total earth disturbance area equal to or greater than one acre on land that did not have any impervious area before work began.

Redevelopment is defined as any construction activity that disturbs greater than or equal to one acre and does not meet the requirements to be designated as new development.

Existing City Practices and Amendments:

The City of Revere has incorporated post construction stormwater management control measures in the Erosion and Sediment Control Plan that was promulgated in 2016. The purpose of the post-construction stormwater management section is the establish minimum requirements and controls to protect and safeguard the environment, natural resources, general health, safety, and welfare of the public.

To comply with the requirements of the 2016 MS4 Permit, the City shall implement the following BMPs:

BMP: As-Built plans for on-site stormwater control
Description: The procedures to require submission of as-built drawings and ensure long term operation and maintenance will be a part of the SWMP
Responsible Department/Parties: Planning/Engineering
Measurable Goals: Require submission of as-built plans for completed projects.
Message Dates: Completed during Permit Year 1 (FY2019). The requirement for as-built plans is documented in the City's Site Plan Review code.

BMP: Target Properties to Reduce Impervious Areas
Description Identify at least 5 permittee-owned properties that could be modified or retrofitted with BMPs to reduce impervious areas and update annually.
Responsible Department/Parties: Planning/Engineering
Measurable Goals: Complete 4 years after effective date of permit and report annually on retrofitted properties.
Message Dates: Started during Permit Year 1 (FY2019), completed during Permit Year 4 (FY2022) and updated annually as needed.

BMP: Allow for Green Infrastructure
Description: Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist.
Responsible Department/Parties: Conservation Commission/Engineering/Planning
Measurable Goals: Complete 4 years after effective date of permit and implement recommendations of report.
Message Dates: Started during Permit Year 1 (FY2019) and completed during Permit Year 4 (FY2022).

BMP: Street Design and Parking Lot Guidelines
Description: Develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support low impact design options.
Responsible Department/Parties: Engineering/Planning
Measurable Goals: Complete 4 years after effective date of permit and implement recommendations of report.
Message Dates: Started during Permit Year 3 (FY2021) and completed during Permit Year 4 (FY2022).

BMP: Ensure the Requirements of the MA Stormwater Handbook are Met
Description: Adoption, amendment, or modification of a regulatory mechanism to meet permit requirements.
Responsible Department/Parties: Engineering/Planning
Measurable Goals: Complete 2 years after effective permit date.
Message Dates: Drafted language during Permit Year 1 (FY2019) and to be completed within 3 years of the permit effective date (FY2021). Updates are planned to be completed during Permit Year 7 (FY2025).

2.2.6 Pollution Prevention / Good Housekeeping

Regulatory Requirement:

Section 2.3.7 of the 2016 MS4 Permit requires the permittee to "implement an operations and maintenance program for permittee-owned operations that has a goal of preventing or reducing pollutant runoff and protecting water quality form all permittee-owned operations."

This minimum control measure includes a training component and has the ultimate goal of preventing or reducing stormwater pollution from municipal activities and facilities such as parks and open spaces, buildings and facilities, vehicles and equipment, and providing for the long-term operation and maintenance of MS4 infrastructure.

Existing City Practices:

Revere has an extensive list of currently employed good housekeeping measures adopted during the 2003 MS4 Permit cycle. Once a year, the DPW preforms catch basin cleaning and all streets are swept at least twice per year. The Revere Fire Department has implemented a spill response and prevention plan.

To achieve compliance with the 2016 MS4 Permit, catch basins must be no more than 50% full at any given time. To achieve this, all structures must be cleaned, measured, logged and monitored to prevent excessive sediment accumulation. These measures are summarized in the following BMP practices:

BMP: O&M Procedures
Description: Create written O&M procedures including all requirements contained in 2.3.7.a.ii for parks and open spaces, buildings and facilities, and vehicles and equipment.
Responsible Department/Parties: Engineering/DPW Operations/External Contractor
Measurable Goals: Complete implement 2 years after effective date of permit.
Message Dates: Completed during Permit Year 3 (FY2021).

BMP: Inventory all Permittee-Owned Property
Description: Inventory all permittee-owned parks and open spaces, buildings and facilities, and vehicles and equipment and update annually.
Responsible Department/Parties: Engineering/DPW Operations/External Contractor
Measurable Goals: Complete 2 years after effective date of permit and implement annually.
Message Dates: Completed during Permit Year 2 (FY2020) and updated annually.

BMP: Infrastructure O&M
Description: Establish and implement a program for repair and rehabilitation of MS4 infrastructure.
Responsible Department/Parties: Engineering/DPW Operations/External Contractor
Measurable Goals: Create and implement an operation and maintenance plan for stormwater infrastructure.
Message Dates: Completed during Permit Year 3 (FY2021).

BMP: Stormwater Pollution Prevention Plan (SWPPP)
Description: Create SWPPPs for maintenance garages, transfer stations, and other waste-handling facilities.
Responsible Department/Parties: Engineering/DPW Operations/External Contractor
Measurable Goals: Complete plans and implement within 2 years of the permit effective date.
Message Dates: Completed during Permit Year 3 (FY2021). Construction of the new City of Revere Department of Public Works Facility was completed in November 2023; a new SWPPP report was developed for the new facility during Permit Year 6 (FY2024).

BMP: Catch Basin Cleaning
Description: Develop a catch basin optimization plan and establish schedule for catch basin cleaning such that each catch basin is no more than 50% full and clean catch basins on that schedule.
Responsible Department/Parties: Engineering/DPW Operations/External Contractor
Measurable Goals: Clean catch basins on established schedule and report number of catch basins cleaned and volume of material removed annually. The City shall optimize the cleaning effort such that all catch basins have been located, measured, cleaned and monitored to ensure that each basin does not become more than 50% full of sediment and debris.
Message Dates: Developed within 3 years of permit effective date (FY2021): data collection and implementation continued through Permit Year 6 (FY2024). .

BMP: Street Sweeping Program
Description: Sweep all streets and permittee-owned parking lots annually in accordance with permit conditions.
Responsible Department/Parties: Engineering/DPW Operations/External Contractor
Measurable Goals: Sweep all streets and permittee-owned parking lots once per year in the spring.
Message Dates: Completed during Permit Year 1 (FY2019) and continued annually.

BMP: Road salt use optimization program
Description: Establish and implement a program to minimize the use of road salt.
Responsible Department/Parties: DPW
Measurable Goals: Implement salt use optimization during deicing season. Track reduction in salt usage based on salt use optimization.
Message Dates: Completed during Permit Year 1 (FY2019).

BMP: Inspections and Maintenance of Stormwater Treatment Structures
Description: Establish and implement inspection and maintenance procedures and frequencies.
Responsible Department/Parties: Engineering/DPW Operations/External Contractor
Measurable Goals: Inspect and maintain treatment structures at lease annually. Track number of structures maintained and inspected annually.
Message Dates: City-owned treatment structures were first identified during Permit Year 5 (FY2023). Completed during Permit Year 5 (FY2023) and Permit Year 6 (FY2024).

3.0 REGULATORY STANDARDS

3.1 Introduction

To prevent pollutants from entering the drainage system and being discharged to the environment with stormwater, Revere has implemented a wide variety of Best Management Practices (BMPs) categorized under the six minimum control measures as discussed earlier in this document. The control measure for Post-Construction Stormwater Management is focused on improving stormwater pollution prevention into the future by ensuring that all new construction includes appropriate requirements for BMPs. To ensure post-construction stormwater management, the City previously developed and adopted the following under the 2003 MS4 Permit.

- Regulatory mechanisms establishing legal authority, prohibitions and requirements
- Design and construction standards governing stormwater infrastructure
- Requirements for long-term Operation and Maintenance (O&M) of structural BMPs.

Additional information regarding the City's current regulatory mechanisms adopted under the 2003 MS4 Permit, as well as the status of the City's compliance with the 2016 MS4 Permit regulatory requirements are included in this section.

3.2 Existing Stormwater Regulatory Mechanisms

Under the 2003 MS4 Permit, the City developed new ordinances to comply with the permit and to improve stormwater management city-wide. The requirements relating to the MS4 permit were placed in Chapter 13.10 - Stormwater Management of Title 13 – Public Services of the City of Revere's Code of Ordinances. A copy of this ordinance is included in Appendix H.

3.2.1 Discharges to the Municipal Drain System Ordinance

Section 13.10.010 – Discharges to the municipal storm drain system was established to eliminate non-stormwater discharges to the City of Revere's municipal storm drain system. This ordinance provides the legal authority to enforce the IDDE plan developed by the City in 2010. Its main purpose is to prevent any introduction of pollutants to Revere's MS4 from stormwater discharges by any user, prohibit illicit connections to the MS4, and to allow the City to monitor the system and remove any found illicit connections. This ordinance prohibits non-stormwater discharges to the drain system. It also provides a specific list of non-stormwater discharges that are permissible under federal regulations, and by reference, local ordinance. The Department of Public Works and Department of Municipal Inspections are responsible for enforcement and have the authority to investigate suspected illicit discharges. The City has the authority to suspend or terminate the right to discharge to the MS4 of any discharger, including discharges associated with active construction sites. The ordinance mandates that all spills must be reported to the DPW, and penalties and fines may be levied. The ordinance is granted authority by the Home Rule Amendment of the Massachusetts Constitution, Home Rule statues, and the Clean Water Act, 40 CFR 122.34.

3.2.2 Erosion and Sediment Control Ordinance

The 2003 MS4 Permit required the City to develop, implement and enforce a program to address stormwater runoff from construction activities that disturb greater than one acre and discharge into the MS4. That program was also to include projects that disturb less than one acre if the project is part of a larger common plan of development which disturbs greater than one acre. As part of that program, the City was to develop an ordinance or other regulatory mechanism to address construction runoff.

Chapter 13.10.020 – Erosion and Sediment Control of Revere's Code of Ordinances (see Appendix H) provides the regulatory authority to ensure compliance with the provisions outlined through performance standards, inspection, reviews, and enforcement. This ordinance requires that an Erosion Control Plan be submitted along with the building permit for approval for any land-disturbing activities of significance. An activity of significance is defined as any change of existing grade of more than two thousand five hundred square feet or twenty-five percent of the lot whichever is smaller, removal of existing vegetation of more than two thousand five hundred square feet or twenty-five percent of the lot whichever is smaller, or storage of more than one hundred cubic yards of excavate or fill.

3.2.3 Post-Construction Stormwater Management Ordinance

The 2003 MS4 Permit required the City to develop, implement and enforce a program to address post-construction stormwater runoff from new development and redevelopment projects that disturb greater than one acre and discharge into the MS4. That program was also to include projects less than one acre if the project is part of a larger common plan of development which disturbs greater than one acre. As part of that program, the town was to develop an ordinance or other regulatory mechanism to address post construction runoff from new development and redevelopment.

Chapter 13.10.030 – Post-Construction Stormwater Management (see Appendix H) provides the regulatory authority to ensure compliance with the provisions outlined through design requirements, review, inspection, and enforcement. This ordinance requires that a Stormwater Management Plan, detailing the planned stormwater controls following construction, be submitted for any land disturbance activities which disturb activity greater than two thousand five hundred square feet and would result in an increased amount of stormwater runoff from the property to public/private property or resource areas, would increase the flow to the municipal storm or sanitary sewer systems, or would alter or modify an existing drainage system.

3.3 Review of Regulatory Mechanisms for Compliance with the 2016 MS4 Permit

A comprehensive review was conducted to evaluate whether the City's existing regulatory mechanisms for construction and post-construction stormwater management comply with the 2016 MS4 Permit requirements, and identify what modifications, if any, are needed to bring the City into compliance.

3.3.1 Construction Site Stormwater Runoff Control

The 2016 MS4 Permit builds on the requirements of the 2003 MS4 Permit for construction site runoff control and requires the following (Year 1 requirements):

Site Inspection & Enforcement

Permit Requirement: Development of written procedures for site inspections and enforcement of sediment and erosion control measures. These procedures shall clearly define who is responsible for site inspections as well as who has authority to implement enforcement procedures. The program shall provide that the permittee may, to the extent authorized by law, impose sanctions to ensure compliance with the local program. These procedures and regulatory authorities shall be documented in the SWMP.

Revere Code of Ordinances, Title 13 – Public Services, Chapter 13.10 – Stormwater Management, 13.10.020 Erosion and Sediment Control, C. Jurisdiction

1. *"No person shall excavate, cut, grade or perform any land-disturbing activities of significance, without an approved erosion and sediment control plan. Activities of significance are those which meet or exceed the following thresholds:*
    a. *Any change of existing grade of more than two thousand five hundred square feet or twenty-five percent of the lot whichever is smaller…"*

Excerpts from Revere's Regulations that Support Permit Requirement:
The entire chapter of the Code of Ordinance, 13.10 – Erosion and Sediment Control outlines the written procedures for site plan review, inspection, and enforcement.

Sediment and Erosion Control BMPs

Permit Requirement: Requirements for construction site operators performing land disturbance activities within the MS4 jurisdiction that result in stormwater discharges to the MS4 to implement a sediment and erosion control program that includes BMPs appropriate for the conditions at the construction site. The program may include references to BMP design standards in state manuals, such as the Massachusetts Stormwater Handbook or design standards developed by the MS4. EPA supports and encourages the use of design standards in local programs. Examples of appropriate sediment and erosion control measures for construction sites include local requirements to:

- *Minimize the amount of disturbed area and protect natural resources*
- *Stabilize sites when projects are complete, or operations have temporarily ceased*
- *Protect slopes on the construction site*
- *Protect all storm drain inlets and armor all newly constructed outlets*
- *Use perimeter controls at the site*
- *Stabilize construction site entrances and exists to prevent off-site tracking*
- *Inspect stormwater controls at consistent intervals*

Excerpts from Revere's Regulations that Support Permit Requirement:
The entire chapter of the Code of Ordinance, 13.10.020 Erosion and Sediment Control, is in place to require a sediment and erosion control program which includes BMPs on site. The chapter references a document prepared by the DEP.

Revere Code of Ordinances, Title 13 – Public Services, Chapter 13.10 – Stormwater Management, 13.10.020 Erosion and Sediment Control, E. Performance Standards

> *"A construction project shall be considered in conformance with this section if soils or other eroded matter has been prevented from being deposited onto adjacent properties, rights-of-ways, public storm drainage system, or wetland or watercourse. The design, testing, installation, and maintenance of erosion and sediment control operations and facilities shall adhere to the standards and specifications contained in the Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas dated March 1997 or the latest edition thereof."*

Control of Wastes

Permit Requirement: Requirements for construction site operators within the MS4 jurisdiction to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes. These wastes may not be discharged to the MS4.

Excerpts from Revere's Regulations that Support Permit Requirement:
The Discharges to the Municipal Drain System, Chapter13.10.010 of Revere's Code of Ordinances clearly defines pollutants as including construction wastes and prohibits them from being discharged to the MS4.

Revere Code of Ordinances, Title 13 – Public Services, Chapter 13.10 – Stormwater Management, 13.10.010 Discharges to the Municipal Drain System, B. Definitions

"13. "Pollutant" means 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 nonpoint 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:

> *…*
> *d. Refuse, garbage, litter, rubbish, yard wastes, or other discarded or abandoned objects, ordnances, accumulations and floatables;*
> *…*
> *f. Hazardous materials and wastes;*
> *g. Sewage;*
> *…*
> *k. Rock, sand, salt, soils, or other products/materials that mobilize in surface water runoff; and*
> *l. Construction wastes and/or residues."*

Revere Code of Ordinances, Title 13 – Public Services, Chapter 13.10 – Stormwater Management, 13.10.010 Discharges to the Municipal Drain System, G. Prohibited Activities

"1. Illicit Discharges. No person shall dump, discharge, cause or allow to be discharged any pollutant or non-stormwater discharge into the storm drain system, into a watercourse, or into waters of the United States and/or commonwealth."

Site Plan Review Inspection and Enforcement

Permit Requirement: Development of written procedures for site plan review, inspection and enforcement. The site plan review procedure shall include a pre-construction review by the

permittee of the site design, the planned operations at the construction site, planned BMPs during the construction phase, and the planned BMPs to be used to manage runoff created after development. The review procedure shall incorporate procedures for the consideration of potential water quality impacts, and procedures for the receipt and consideration of information submitted by the public. The site plan review procedure shall also include evaluation of opportunities for use of low impact design and green infrastructure. When the opportunity exists, the permittee shall encourage project proponents to incorporate these practices into the site design. The procedures for site inspection conducted by the permittee shall include the requirement that inspections occur during construction of BMPs as well as after construction of BMPs to ensure they are working as described in the approved plans, clearly defined procedures for inspections including qualifications necessary to perform the inspections, the use of mandated inspections forms if appropriate, and procedure for tracking the number of site reviews, inspections, and enforcement actions.

Excerpts from Revere's Regulations that Support Permit Requirement:
The entire chapter of the Code of Ordinance, 17.17 – Site Plan Review outlines the written procedures for site plan review, inspection, and enforcement.

Revere Code of Ordinances, Title 17 Zoning, Chapter 17.17 – Site Plan Review, 17.17.020 Applicability

A. *"The building inspector shall not issue a building permit unless and until a site plan review has been completed by the site plan review committee (SPRC), and no building permit may be issued unless in conformance with an approved site plan, except as provided in subsection B of this section and Section 17.17.040(E).*

B. *Site plan review is required for all uses allowed as of right or special permit and listed in Section 17.16.040, Table of Uses, and for all extensions of nonconforming uses. No building permit shall be issued in any case where a building is to be erected or externally enlarged and no area for parking, loading or vehicular service shall be established or substantially changed except in conformity with a site plan bearing an endorsement of approval by the site plan review committee. Site plan approval shall not be required in any case where a building is to be externally changed for the purpose of closing an entrance or creating a new entrance thereto and for other extension(s) to a building which in total shall not exceed one thousand square feet of gross floor area."*

Additionally, Revere's Stormwater Management Chapter 13.10 of its Code of Ordinances clearly outlines a review and approval procedure for the required erosion and sediment control plan. The review is triggered by a building permit application.

Revere Code of Ordinances, Title 13 – Public Services, Chapter 13.10 – Stormwater Management, 13.10.020 Erosion and Sediment Control, B. Definitions

A. "Review and Approval. An erosion and sediment control review is triggered by a building permit application or other activity that falls within the jurisdiction described in subsections C and D above. Applicants are referred by the permit-issuing agency to the Department of Public Works and City Engineer to conduct the erosion and sediment control review. Activities that fall within the jurisdiction described in subsections C and D above that do not

require a permit from any city department are not exempt from this provision. In this situation, the applicant must seek erosion and sediment control review directly from the department of public works.

1. The Department of Public Works will review each erosion and sediment control plan to determine its conformance with the provisions of this section. Within thirty calendar days after receiving an application, the Department of Public Works shall, in writing:
    a. Approve the plan as submitted;
    b. Approve the plan subject to such reasonable conditions as may be necessary to secure substantially the objectives of this regulation, and issue the permit subject to these conditions; or
    c. Disapprove the plan, indicating the reason(s) and procedure for submitting a revised application and/or submission.

2. Failure of the Department of Public Works to act on an original or revised plan within thirty calendar days of receipt shall authorize the applicant to proceed in accordance with the plans as filed unless such time is extended by agreement between the applicant and the department of public works. Pending preparation approval of a revised plan, development activities shall be allowed to proceed in accordance with conditions established by the department of public works."

Inspection guidance and enforcement mechanisms are provided within the same Chapter 13.10 – Stormwater Management. Written inspection procedures are maintained at City Hall and included in Appendix I.

Revere Code of Ordinances, Title 13 – Public Services, Chapter 13.10 – Stormwater Management, 13.10.020 Erosion and Sediment Control, G. Inspections

1. "The superintendent of public works, or designated agent shall make inspections as hereinafter required and either shall approve that portion of the work completed or shall notify the owner or person responsible for the implementation of the plan wherein the work fails to comply with the erosion and sediment control plan as approved. Plans for grading, stripping, excavating, and filling work bearing the stamp of approval of the department of public works shall be maintained at the site during the progress of the work. To obtain inspections, the permittee shall notify the department of public works at least two working days before the following:

    a. Installation of sediment and erosion control measures*;
    b. Start of construction;
    c. Completion of site clearing;
    d. Completion of rough grading;
    e. Close of the construction season;
    f. Completion of final landscaping.
    * Only notification required on minor projects.

2. The person responsible for implementation of the plan shall make regular inspections of all control measures in accordance with the inspection schedule

outlined on the approved erosion and sediment control plan(s). The purpose of such inspections will be able to determine the overall effectiveness of the control plan and the need for additional control measures. All inspections shall be documented in written form and submitted to the department of public works at the time interval specified in the approved permit.

3. The superintendent of public works or its designated agent shall enter the property of the applicant as deemed necessary to make regular inspections to ensure the validity of the reports filed as noted above."

Revere Code of Ordinances, Title 13 – Public Services, Chapter 13.10 – Stormwater Management, 13.10.020 Erosion and Sediment Control, G. Enforcement

1. "Suspension of Construction or Site Alteration Activity. In the event that the activity at a site violates the conditions as stated or shown on the approved erosion and sediment control plan in such a manner as to adversely affect the environment, public welfare/health and municipal facilities, then the superintendent of public works or director of municipal inspections may suspend work until the violations are corrected."

3.3.2 Post-Construction Stormwater Management

The 2016 MS4 Permit builds on the requirements of the 2003 MS4 Permit for post construction runoff from new development and redevelopment and requires the following (Year 3 requirements):

Low Impact Development

Permit Requirement: Low Impact Development (LID) site planning and design strategies must be implemented unless infeasible in order to reduce the discharge of stormwater from development sites.

Excerpts from Revere's Regulations that Support Permit Requirement:
Though Low Impact Development planning and design is discussed during site plan review, there is no current requirement that LID planning and design be used to the maximum extent feasible.

Recommended Modifications:
Revere's Chapter 13.10 Stormwater Management ordinance should be amended to include Low Impact Development site planning and strategies as a required standard.

BMP Design Guidance

Permit Requirement: Stormwater management systems design shall be consistent with, or more stringent than, the requirements of the 2008 Massachusetts Stormwater Handbook.

Excerpts from Revere's Regulations that Support Permit Requirement: Revere's Chapter 13.10 Stormwater Management Ordinance does reference performance standards as defined in the MA Stormwater Management Policy, which is an outdated reference which was replaced by the Massachusetts Stormwater Handbook and Stormwater Standards.

Revere Code of Ordinances, Title 13 – Public Services, Chapter 13.10 – Stormwater Management, 13.10.030 Post-construction stormwater management, E. Design Requirements and Standards

1. *Performance Standards. Control of stormwater runoff shall meet the performance standards for both flood control (volume and peak discharge) and nonpoint source pollution reduction as defined in the Massachusetts Stormwater Management Policy dated March 1997 as amended. All assumptions, methodologies and procedures used to design BMPs and stormwater management practices shall accompany the design. All activities, project design, BMPs, and stormwater management practices should aim to minimize stormwater runoff, maximize infiltration and recharge where appropriate, and minimize pollutants in stormwater runoff."*

Recommended Modifications:
The Performance Standards item excerpted above should be amended to specify design standards consistent or more stringent than the 2008 Massachusetts Stormwater Handbook.

Compliance with the Stormwater Management Standards for New Development

Permit Requirement: Stormwater management systems on new development shall be designed to meet an average annual pollutant removal equivalent to 90% of the average annual load of Total Suspended Solids (TSS) related to the total post-construction impervious area on the site AND 60% of the average annual load of Total Phosphorus (TP) related to the total postconstruction impervious surface area on the site.
a) Average annual pollutant removal requirements in 2.3.6.a.ii.3 are achieved through one of the following methods:
1. installing BMPs that meet the pollutant removal percentages based on calculations developed consistent with EPA Region 1's BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or State-approved BMP design guidance or performance standards (e.g., State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance; or
2. retaining the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area on the new development site; or
3. meeting a combination of retention and treatment that achieves the above standards; or
4. utilizing offsite mitigation that meets the above standards within the same USGS HUC12 as the new development site.

Excerpts from Revere's Regulations that Support Permit Requirement: Revere's Chapter 13.10 Stormwater Management Ordinance references the performance standards of the MA Stormwater Management Policy, which is an outdated reference. Revere's regulations do not include the additional standards required by the MS4 permit.

Revere Code of Ordinances, Title 13 – Public Services, Chapter 13.10 – Stormwater Management, 13.10.030 Post-construction stormwater management, E. Design Requirements and Standards

1. *"Performance Standards. Control of stormwater runoff shall meet the performance standards for both flood control (volume and peak discharge) and nonpoint source pollution reduction as defined in the Massachusetts Stormwater Management Policy dated March 1997 as*

amended. All assumptions, methodologies and procedures used to design BMPs and stormwater management practices shall accompany the design. All activities, project design, BMPs, and stormwater management practices should aim to minimize stormwater runoff, maximize infiltration and recharge where appropriate, and minimize pollutants in stormwater runoff."

Recommended Modifications:
The Performance Standards item from Revere's Chapter 13.10 should be amended to include the excerpt from the permit above regarding annual TSS and TP removal for new development.

Compliance with the Stormwater Management Standards for Redevelopment

Permit Requirement: Stormwater management systems on redevelopment sites shall be designed to meet an average annual pollutant removal equivalent to 80% of the average annual postconstruction load of Total Suspended Solids (TSS) related to the total post-construction impervious area on the site AND 50% of the average annual load of Total Phosphorus (TP) related to the total post-construction impervious surface area on the site.
a) Average annual pollutant removal requirements in 2.3.6.a.ii.4 above are achieved through one of the following methods:
1. installing BMPs that meet the pollutant removal percentages based on calculations developed consistent with EPA Region 1's BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or State-approved BMP design guidance or performance standards (e.g., State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance; or
2. retaining the volume of runoff equivalent to, or greater than, 0.8 inch multiplied by the total post-construction impervious surface area on the redeveloped site; or
3. meeting a combination of retention and treatment that achieves the above standards; or
4. utilizing offsite mitigation that meets the above standards within the same USGS HUC12 as the redevelopment site.

Excerpts from Revere's Regulations that Support Permit Requirement: Similar to the new development post-construction standards, the standards for redevelopment are covered in Revere's Chapter 13.10 Stormwater Management. This ordinance does not currently distinguish between new and redevelopment projects, and therefore does not provide for alternative methods to meet retention and pollutant removal requirements.

Revere Code of Ordinances, Title 13 – Public Services, Chapter 13.10 – Stormwater Management, 13.10.030 Post-construction stormwater management, E. Design Requirements and Standards
"1. Performance Standards. Control of stormwater runoff shall meet the performance standards for both flood control (volume and peak discharge) and nonpoint source pollution reduction as defined in the Massachusetts Stormwater Management Policy dated March 1997 as amended. All assumptions, methodologies and procedures used to design BMPs and stormwater management practices shall accompany the design. All activities, project design, BMPs, and stormwater management practices should aim to minimize stormwater runoff, maximize infiltration and recharge where appropriate, and minimize pollutants in stormwater runoff."

Recommended Modifications:

Should the City wish to differentiate between redevelopment and new development projects, the Performance Standards item excerpted above should be amended to include the excerpt from the permit above regarding annual TSS and TP removal for redevelopment. The outdated reference from the Massachusetts Stormwater Management Policy should be removed and updated to the Massachusetts Stormwater Handbook and Stormwater Standards.

Permit Requirement: Redevelopment activities that are exclusively limited to maintenance and improvement of existing roadways, (including widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving projects) shall improve existing conditions unless infeasible and are exempt from part 2.3.6.a.ii.4. Roadway widening or improvements that increase the amount of impervious area on the redevelopment site by greater than or equal to a single lane width shall meet the requirements of part 2.3.6.a.ii.4.

Excerpts from Revere's Regulations that Support Permit Requirement:
The applicability for the Stormwater Ordinance does not exclude maintenance. It is based on a determination of increased flow to the MS4.

Revere Code of Ordinances, Title 13 – Public Services, Chapter 13.10 – Stormwater Management, 13.10.030 Post-construction stormwater management, C. Jurisdiction

"1. No person shall conduct land disturbance activities which would exceed the following thresholds without an approved stormwater management plan:

a. Any land disturbance activity greater than two thousand five hundred square feet which would result in an increased amount of stormwater runoff from the property to public/private property or resource areas;
b. Any activity which would increase the flow to the municipal storm or sanitary sewer systems;
c. Any activity which would alter or modify an existing drainage system.

2. Activities which are exempt from the requirements of an approved stormwater management plan are:

a. Emergency repairs to any stormwater structure;
b. Maintenance of existing gardens or lawns;
c. Construction of utilities, other than drainage, which would not alter the terrain, ground cover or drainage patterns."

Submission of As-Builts

Permit Requirement: The permittee shall require, at a minimum, the submission of as-built drawings no later than two (2) years after completion of construction projects. The as-built drawings must depict all on site controls, both structural and non-structural, designed to manage the stormwater associated with the completed site (post construction stormwater management).

Excerpts from Revere's Regulations that Support Permit Requirement:
Revere's Site Plan Review procedures require that as-built plans be submitted to the building inspector before he may issue a permanent occupancy permit. However, the Zoning Ordinance,

where this requirement is specified, does not specify that stormwater management BMPs be included in the as-built plans.

Revere Code of Ordinances, Title 17 Zoning, Chapter 17.17 – Site Plan Review, 17.17.100 – As-built plans

"Before the issuance of a permanent occupancy permit, the building inspector shall require that the applicant submit two copies of "as-built-plans." One copy of said plans shall be forwarded to the SPRC, as-built plans shall include the following: existing location of foundation with off sets to all front, side and rear yards with a tolerance no less than 1/10th of one foot; as-built grading and drainage plan showing grades to adjacent lots; landscaping plan; foundation elevation and elevation certificate for all properties within the one hundred year floodplain; all utility locations and easements; parking plans and driveways; all decks, porches, accessory structures and retaining walls."

Recommended Modifications:

The Site Plan Review procedures of the Zoning Ordinance should be amended to require the inclusion of stormwater management BMPs on the as-built plans.

Long-term Operation & Maintenance

Permit Requirement: The new development/redevelopment program shall have procedures to ensure adequate long-term operation and maintenance of stormwater management practices that are put in place after the completion of a construction project. These procedures may include the use of dedicated funds or escrow accounts for development projects or the acceptance of ownership by the permittee of all privately owned BMPs. These procedures may also include the development of maintenance contracts between the owner of the BMP and the permittee. Alternatively, these procedures may include the submission of an annual certification documenting the work that has been done over the last 12 months to properly operate and maintain the stormwater control measures. The procedures to require submission of as-built drawings and ensure long term operation and maintenances shall be a part of the SWMP.

Excerpts from Revere's Regulations that Support Permit Requirement:

An Operation and Maintenance Schedule is required as part of the Stormwater Management Permit approval process as specified in Revere's Chapter 13.10 Stormwater Management Ordinance.

Revere Code of Ordinances, Title 13 – Public Services, Chapter 13.10 – Stormwater Management, 13.10.030 Post-construction stormwater management, D. Stormwater Management Plan

"The minimum information, in addition to the name, address and telephone number of the owner, civil engineer and person responsible for implementation of the plan, submitted for support of a stormwater management plan shall be as follows:

…

15. Operation and maintenance schedule;"

Recommended Modifications:

Though an Operation and Maintenance Schedule is required to be submitted as part of the Stormwater Management Plan, it may be beneficial to provide additional language to clarify what information must be included in the O&M plan.

4.0 IDDE MONITORING AND PROGRESS

4.1 IDDE Plan

The 2016 MS4 Permit defines an illicit discharge "as any discharge to a municipal separate storm sewer that is not composed entirely of stormwater" including, but not limited to:

- Fixed point source discharges such as illegal/improper sanitary or floor drain connections, and cross connections between the sanitary and drainage infrastructure,
- Isolated or recurring discharges such as illegal dumping and improper disposal of waste from boats, and
- Indirect sources that infiltrate into the drainage system through cracks/defects in infrastructure, such as sanitary wastes from failing sewer pipes.

Exceptions do exist in the regulation for the discharge of clean water from sources such as water line flushing, fire-fighting operations, non-contact cooling waters, and for other discharges that have separately obtained a permit from the NPDES Program.

As part of Minimum Control Measure No. 3, Illicit Discharge Detection and Elimination (IDDE) under the 2016 MS4 Permit, the City is required to implement their Illicit Discharge Detection and Elimination Investigation Program by presenting a defined approach to investigate, identify, and remove illicit connections. The City was required to develop the written plan in Year 1 and then continue to implement the plan throughout the permit term. Finding, eliminating, and preventing non-stormwater discharges to the City's MS4 includes, but is not limited to, the following measures:

1. Developing a comprehensive map of the City's drainage system that builds upon the outfalls and receiving waters that were previously mapped under the 2003 MS4 Permit.
2. Ensuring that appropriate regulatory mechanisms and enforcement procedures, as required under the 2003 MS4 Permit, are in place to prohibit illicit discharges.
3. Developing and implementing a written plan to detect and eliminate illicit discharges, which references the City's authority to implement all aspects of the IDDE program, clearly identifies responsibilities with regard to eliminating illicit discharges, and outlines written procedures for dry and wet weather outfall screening and sampling and catchment investigations.
4. Providing training annually to employees involved in the IDDE program about the program, including how to recognize illicit discharges and SSOs.

Revere has developed a comprehensive written IDDE Plan, under separate cover, to meet the requirements of the 2016 MS4 Permit.

4.1.1 Mapping

The City's entire drainage system has been mapped, outfalls have been identified, and interconnections from other MS4s into Revere have been located. Each outfall and interconnection have been analyzed to create a defined catchment area that includes the portion of City that contributes drainage from catch basins.

4.1.2 Sampling and Analysis

The City of Revere conducts annual monitoring of municipal stormwater outfalls. The monitoring consists of inspection and, if appropriate, sampling of discharges at each outfall during alternating dry and wet-weather conditions once per year. Intermunicipal connections are also a part of this program.

For the testing purposes, a dry-weather period is defined as a minimum of 48 hours without precipitation. All outfalls are inspected for the presence of dry weather flow at the time of monitoring. The City conducted dry weather screening of regulated outfalls during Permit Year 6. In accordance with outfall screening procedures and permit conditions, any outfalls found to be flowing were sampled for temperature, salinity, conductivity, chlorine, ammonia, surfactants, E. coli, and pollutants of concern. There were 25 outfalls screened during Permit Year 6.

The City conducted wet weather screening of regulated outfalls during Permit Year 6. There were 25 outfalls visited during wet weather conditions, and where flow was observed it was sampled. In accordance with outfall screening procedures and permit conditions, outfalls were sampled for temperature, salinity, conductivity, chlorine, ammonia, surfactants, E. coli, and pollutants of concern.

4.1.3 Field Investigation

The MS4 Permit requires the City to develop a storm drain network investigation that involves systematically and progressively observing, sampling and evaluating key junction manholes in the MS4 to determine the approximate location of suspected illicit discharges or SSOs.

Once the source of an illicit discharge is approximated between two manholes, more detailed investigation techniques will be used to isolate and confirm the source of the illicit discharge. The following methods may be used in isolating and confirming the source of illicit discharges:

- Sandbagging - If no flow is observed at a particular junction manhole or key junction manhole at the time of inspection, the drain segment in the area of concern can be isolated by placing sandbags within outlets to manholes to form a temporary dam that collects any intermittent flow for a 24 to 48-hour dry weather period to determine if any intermittent dry-weather flow is present. If intermittent flow is captured, grabs samples will be collected and analyzed at a minimum for ammonia, chlorine, and surfactants. If it is determined that no flow is captured behind the sandbag after a 24 to 48-hour period, the tributary drainage pipes can be excluded as the source of any intermittent discharge.
- Dye Testing - dyed water is poured into plumbing fixtures and downstream drainage is observed to confirm connections.
- ZoomCam Inspections - in selected tributary areas, or where indicated based on findings from other field investigation work, drainage structures will be inspected with a “zoom camera-on-a-stick” in an attempt to gather additional information and narrow the location of observed dry-weather flow.
- Smoke Testing - non-toxic smoke is introduced into drainage segments containing suspected illicit discharges and adjacent buildings are observed for signs of a connection, or smoke emanating from floor drains or sump pump connections.

- CCTV/Video Inspections – drainage pipes are internally inspected to pinpoint and evaluate connections through the use of a closed-circuit television camera through all or a portion of the drain segment believed to contain the connection.

Upon location of an illicit discharge, the City will work to eliminate the illicit discharge as expeditiously as possible. When the specific source of an illicit discharge is identified, the City of Revere will exercise its authority as necessary to require its removal. The City will notify all responsible parties of any such discharge and require immediate cessation of improper disposal practices in accordance with its legal authorities.

4.1.4 Sanitary Sewer Overflows

Sanitary Sewer Overflows (SSOs) are included in the MS4 Permit's definition of illicit discharges and can be defined as 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 can be caused by blockages, line breaks, power failures, vandalism, and sewer defects. This includes SSOs resulting during dry or wet weather, from inadequate conveyance capacities, or where interconnectivity of the storm and sanitary sewer infrastructure allows for communication of flow between the systems.

During Permit Year 6, 25 SSOs occurred. The City of Revere has consistently maintained an inventory of SSOs since 2013. An inventory of SSOs that have occurred since 2013 is included in Appendix J.

5.0 STANDARD OPERATING PROCEDURES

5.1 MS4 Permit Requirement

As part of the minimum control measure for Pollution Prevention/Good Housekeeping for Municipal Operations, the MS4 Permit requires permittees to implement an Operations and Maintenance (O&M) program for permittee-owned facilities and activities to prevent or reduce pollutant runoff and protect water quality. The O&M Program is required to include the following elements:

1) An inventory of all permittee-owned facilities.
2) Written O&M procedures for the following activities:
    a. Parks and open space
    b. Buildings and facilities where pollutants are exposed to runoff
    c. Vehicles and equipment
3) A written program detailing the activities and procedures the permittee will implement so that MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4, to include:
    a. Optimization of routine inspections, cleaning and maintenance of catch basins.
    b. Implementation of procedures for sweeping and/or cleaning streets, and permittee-owned parking lots.
    c. Proper storage and disposal of catch basin cleanings and street sweepings.
    d. Implementation of procedures for winter road maintenance.
    e. Implementation of inspection and maintenance frequencies and procedures for storm drain systems and stormwater treatment structures.
4) Written records for all maintenance activities, inspections and training.

5.2 Inventory of Municipal Facilities

Revere has developed a comprehensive Operations and Maintenance (O&M) Plan to meet permit requirements, included in Appendix K. The inventory of municipally-owned facilities and property, including vehicles, equipment, and stormwater treatment structures is included in Appendix C of the O&M Plan.

5.3 Operation and Maintenance Procedures for Municipal Activities and Facilities

Revere's comprehensive O&M Plan includes Standard Operating Procedures (SOPs) which address the MS4 Permit requirements. SOPs associated with the identified municipal activities and facilities were developed by September 2020 and are updated as needed. The SOPs are included in the O&M Plan which is located in Appendix K. The following SOPs are included:

- Parks and Open Space Management
- Operation and Maintenance of Buildings and Facilities
- Operation and Maintenance of Municipal Vehicles and Equipment
- Catch Basin Inspection and Cleaning
- Street Sweeping
- Winter Road Maintenance

5.4 Catch Basin Cleaning and Optimization

The City currently has 4,148 catch basins, which are cleaned on an annual basis. The City contracts out catch basin cleaning to a private company, which is responsible for cleaning each basin and disposing of the accumulated sediments in accordance with state and local requirements. Currently, catch basin cleaning is performed with a clam shell bucket attachment. Cleaning occurs city-wide, typically during the summer. Outside of annual cleaning, the DPW performs catch basin cleaning in response to complaints or inquiries using a vacuum machine.

To meet anticipated requirements of the new MS4 Permit, the City will need to optimize catch basin inspection, cleaning and maintenance such that the following conditions are met:

- Inspection and maintenance of catch basins located near construction activities (roadway construction, residential, commercial, or industrial development or redevelopment) are prioritized. Catch basins in such areas must be cleaned more frequently if inspection and maintenance activities indicate excessive sediment or debris loading.

- A schedule must be established such that the frequency of routine cleaning ensures that no catch basin at any time will be more than 50 percent full. A catch basin sump is more than 50 percent full if the contents within the sump exceed one half the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin.

- If a catch basin sump is more than 50 percent full during two consecutive routine inspections/cleaning events, the City must document the finding, investigate the contributing drainage area for sources of excessive sediment loading, and to the extent practicable, abate contributing sources.

- The City shall maintain documentation, including metrics and other information, used to reach the determination that the established plan for cleaning and maintenance is optimal and meets the requirements of the MS4 Permit, including a log of catch basins cleaned and inspected.

- The City must continue to track and report the following information to EPA annually:

    - Total number of catch basins City-wide
    - Number of catch basins inspected
    - Number of catch basins cleaned
    - Total volume or mass of material removed from all catch basins

The City is currently working to collect data as part of their optimization plan to ensure that no catch basin is more than 50% full. Procedures exist in the O&M Plan for what actions to take if a catch basin is found to be more than 50% full.

6.0 TMDLS AND WATER QUALITY LIMITED WATERS

6.1 Discharges to Water Quality Limited Waters

Under Massachusetts General Law (MGL) Chapter 21, MassDEP is responsible for monitoring the waters of the Commonwealth, identifying those waters that are impaired, and developing a plan to bring them back into compliance with Massachusetts Surface Water Quality Standards. The list of impaired waters, better known as the "303(d) list," identifies impaired surface waters and the reasons for impairment.

Once a waterbody is identified as impaired, MassDEP is required by the Federal Clean Water Act (CWA) to develop a strategy for restoring the health of the impaired waterbody. The process of developing this strategy, which is generally referred to as a Total Maximum Daily Load (TMDL) includes identifying the type of pollutant, and the potential sources of the pollutant, in addition to determining the maximum amount of pollutant that can be discharged to a specific surface water body to meet surface water quality standards. Part of the TMDL also includes the development of a plan to help in meeting the Total Maximum Daily Load limits once they have been established. Impaired waters with TMDLs are listed under Category 4A of the 303d list. There are currently two approved TMDLs applicable to Revere, both concerning bacteria impairments. These include the *Final Pathogen TMDL for the North Coastal Watershed* and *The Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds*. Category 5 of the 303(d) List of Impaired Waters also identifies water bodies that are impaired for one or more designated uses and require the development of a TMDL. There are currently five waters requiring TMDLs that are applicable to Revere. These include *Belle Isle Inlet (MA71-14), the Chelsea River (MA71-06), Mill Creek (MA71-08), the Saugus River (MA93-44), and Unnamed Tributary (Town Line Brook) (MA93-51).*

6.2 Bacteria/Pathogens Impairments

There are a total of three regulated outfalls that discharge from Revere into Belle Isle Inlet, four regulated outfalls that discharge into Mill Creek, and one outfall that discharges to the Saugus River that need to be monitored under the IDDE plan. The priority ranking has been determined by a comprehensive matrix, taking numerous factors into account, including but not limited to: sensitivity or critical nature of the receiving water or environment, severity of the illicit connection indicator parameters, potential for direct or indirect public exposure, areas with chronic problems and inadequate level of service, areas proposed for infrastructure capital improvements. The priority status of those outfalls has been determined by the progress achieved since the IDDE program begin in 2006. A priority ranking system would be redundant in Revere, and investigative priority will be given to those outfalls and interconnections which show any sign of illicit connection over the course of routine testing that Revere has engaged in to date.

6.2.1 Public Education and Outreach

To comply with the TMDL, the City of Revere disseminates educational material to dog owners at the time of pet license distribution, including information about the proper management of pet waste. There are no septic systems in the City of Revere, and so proper maintenance of septic systems is not a concern for the City's bacteria impairments.

See *2013 Comprehensive Wastewater and Stormwater Management Plan* , Section 8 Public Outreach (page 8-1).

6.3 Oil and Grease, TSS and Turbidity Impairments

Impaired waters in Revere without an approved TMDL for a specific impairment (that could be related to stormwater discharges) include segment MA93-44 of the Saugus River for oil and grease and segment MA71-06 of the Chelsea River for petroleum hydrocarbons and turbidity.

The City is required to comply with the impaired waters requirements for solids and oil and grease for the Chelsea and Saugus Rivers. The City's Stormwater Management Ordinances must include a requirement that for new development and redevelopment, stormwater management systems designed on commercial and industrial land use areas draining to impaired waters incorporate spill containment isolation.

Street sweeping and catch basin cleaning must also be increased in high density tributary areas as needed. The City currently sweeps all main streets and major arterial streets at least twice per year. All other streets are swept twice per year. Catch basins are cleaned on an annual basis. This street sweeping and catch basin cleaning frequency is adequate to meet the conditions of the permit. The activities to be performed in the 2016 MS4 permit (as discussed previously in this SWMP) will help maintain an adequate cleaning schedule.

7.0 REPORTING, EVALUATION AND MODIFICATION

7.1 MS4 Permit Reporting

The MS4 Permit requires submission of annual reports assessing the effectiveness of the proposed BMPs and reporting if the minimum control measures were met. The initial report is due 90 days from the close of the reporting period, or September 29th, 2019, and annually thereafter. Reports are to be submitted to both EPA and MADEP. At a minimum, the report should include the following:

- The status of compliance with permit conditions, including an assessment of the appropriateness of the selected BMPs and progress toward achieving the selected measurable goals for each minimum control measure.
- Results of any information collected and analyzed, including monitoring data, if any. Outfall screening and monitoring data collected shall be submitted for both the reporting cycle and cumulative for the permit term.
- A summary of the stormwater activities planned for the next reporting cycle.
- A change in any identified best management practices or measurable goals for any minimum control measure.
- Notice of relying on another governmental entity to satisfy some of the permit obligations, if applicable.

As indicated in an earlier section, copies of past annual reports submitted by Revere are referenced in Appendix E of this SWMP. Revere will append future annual reports in compliance with the 2016 MS4 Permit as they are prepared in Appendix L.

7.2 Evaluation of SWMP Success

This SWMP should be considered a dynamic document that is modified as necessary to account for changes such as in drainage infrastructure, laws and regulations, and City leadership and policy. The success of programs implemented by the SWMP – such as IDDE – should also be evaluated to ensure that they are accomplishing the goals for which they were intended and in a method and timetable that continues to be appropriate. In addition, the SWMP should be reviewed and revised as necessary to keep text and appendices current. For example:

- After each year of stormwater monitoring to update appended findings and priorities.
- As needed to keep appended IDDE investigation, identification and removal documentation current.
- After each NPDES stormwater permit renewal to incorporate new requirements, as well as append copies of new permits and associated Notices of Intent (NOIs).

- After adoption of any new or revised ordinances or other regulatory mechanisms related to stormwater or drainage infrastructure.

Revere undertook this SWMP, in part, to ensure the protection of its water resources and the large investment in drainage infrastructure. Periodic review and revision of this written document will help consistently achieve these goals.

7.3 Modifications to the SWMP or Notice of Intent

As discussed above, minor modifications to this SWMP should be made on a regular and frequent basis to keep it current. Annual updates have been denoted in the section or subsection heading. However, major changes to the SWMP or needed modifications to the NOI for inclusion under the NPDES Permit require an official process. In accordance with the MS4 Permit, modifications to the SWMP or NOI may be made under the following provisions:

- At any time, the City may add (but not subtract or replace) components, controls or requirements to the SWMP.
- The City may request to replace an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP at any time as long as the basis for the change is documented in the SWMP by, at a minimum:
    - An analysis of why the BMP is ineffective or infeasible (or cost prohibitive).
    - Expectations on the effectiveness of the replacement BMP.
    - An analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.
- The City shall indicate BMP modifications along with a brief explanation of the modification in each Annual Report.

At this time, Revere does not anticipate any major modifications to the SWMP or NOI requiring official notification.

APPENDIX A

Abbreviations and Definition

ABBREVIATIONS AND DEFINITIONS

Best Management Practices (BMPs) - schedules of activities, practices (and prohibitions of practices), structures, vegetation, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Common Plan of Development - A "larger common plan of development or sale" is a contiguous area where multiple separate and distinct construction activities may be taking place at different times different schedules under one plan. For example, if developer buys a 20-acre lot and builds roads, installs pipes, and runs electricity with the intention of constructing homes or other structures sometime in the future, this would be considered a larger common plan of development or sale. If the land is parceled off or sold, and construction occurs on plots that are less than one acre by separate, independent builders, this activity still would be subject to stormwater permitting requirements if the
smaller plots were included on the original site plan.

Control Measure - refers to any BMP or other method (including effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

Director - a Regional Administrator of the Environmental Protection Agency or an authorized representative.

Discharge - when used without qualification, means the "discharge of a pollutant."

Discharge of a pollutant - any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from surface runoff which is collected or channeled by man; or discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works.

Discharge-related activities - activities which cause, contribute to, or result in stormwater and allowable non-stormwater point source discharges, and measures such as the siting, construction and operation of BMPs to control, reduce, or prevent pollution in the discharges.

Disturbance - action to alter the existing vegetation and/or underlying soil of a site, such as clearing, grading, site preparation (e.g., excavating, cutting, and filling), soil compaction, and movement and stockpiling of top soils.

Existing Discharger – an operator applying for coverage under this permit for discharges covered previously under an NPDES general or individual permit.

Facility or Activity - any NPDES “point source” or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

Federal Facility – Any buildings, installations, structures, land, public works, equipment, aircraft, vessels, and other vehicles and property, owned by, or constructed or manufactured for the purpose of leasing to, the federal government.

Illicit Discharge - any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.

Impaired Water – A water is impaired if it does not meet one or more of its designated use(s). For purposes of this permit, "impaired" refers to categories 4 and 5 of the five-part categorization approach used for classifying the water quality standards attainment status for water segments under the TMDL program. Impaired waters compilations are also sometimes referred to as "303(d) lists." Category 5 waters are impaired because at least one designated use is not being supported or is threatened and a TMDL is needed. Category 4 waters indicate that at least one designated use is not being supported but a TMDL is not needed (4a indicates that a TMDL has been approved or established by EPA; 4b indicates other required control measures are expected in result in the attainment of water quality standards in a reasonable period of time; and 4c indicates that the nonattainment of the water quality standard is the result of pollution (e.g. habitat) and is not caused by a pollutant). See USEPA's 2006 Integrated Report Guidance, July 29, 2005 for more detail on the five-part categorization of waters [under EPA National TMDL Guidance http://www.epa.gov/owow/tmdl/policy.html]).

Impervious Surface- Any surface that prevents or significantly impedes the infiltration of water into the underlying soil. This can include but is not limited to: roads, driveways, parking areas and other areas created using non porous material; buildings, rooftops, structures, artificial turf and compacted gravel or soil.

Industrial Activity - the ten categories of industrial activities included in the definition of "stormwater discharges associated with industrial activity," as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi).

Industrial Stormwater - stormwater runoff associated with the definition of "stormwater discharges associated with industrial activity."

Interconnection – the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is eventually conveyed to a water of the United States. Interconnections shall be treated similarly to outfalls throughout the permit.

Junction Manhole - For the purposes of this permit, a junction manhole is a manhole or structure 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 junction manholes for these purposes.

Key Junction Manhole - For the purposes of this permit, key junction manholes are those junction manholes that can represent one or more junction manholes without compromising adequate implementation of the illicit discharge program. Adequate implementation of the illicit discharge

program would not be compromised if the exclusion of a particular junction manhole as a key junction manhole would not affect the permittee's ability to determine the possible presence of an upstream illicit discharge. A permittee may exclude a junction manhole located upstream from another located in the immediate vicinity or that is serving a drainage alignment with no potential for illicit connections.

Municipal Separate Storm Sewer - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):(i) Owned or operated by a State, City, City, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designed or used for collecting or conveying stormwater;(iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Municipal Separate Storm Sewer System (MS4) - means all separate storm sewers that are defined as "large" or "medium" or "small" municipal storm sewer systems pursuant to paragraphs 40 CFR 122.26 (b)(4) and (b)(7), or designated under paragraph 40 126.26(a) (1)(v). For the purposes of this permit "MS4" may also refer to the permittee with jurisdiction over the sewer system.

New Development – any construction activities or land alteration resulting in total earth disturbances greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) on an area that has not previously been developed to include impervious cover. (see part 2.3.6. of the permit)

New Discharger – For the purposes of this permit, a new discharger is an entity that discharges stormwater from a new facility with an entirely new separate storm sewer system that is not physically located on the same or adjacent land as an existing facility and associated system operated by the same MS4.

New Source - any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:

- after promulgation of standards of performance under section 306 of the CWA which are applicable to such source, or
- after proposal of standards of performance in accordance with section 306 of the CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal.

No exposure - all industrial materials or activities are protected by a storm-resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff.

One Lane Width – The width of the travel lane for a roadway. Lane width does not include shoulders, curbs, and on-street parking areas.

Outfall Catchment – The land area draining to a single outfall or interconnection. The extent of an outfall's catchment is determined not only by localized topography and impervious cover but also by the location of drainage structures and the connectivity of MS4 pipes.

Owner or operator - the owner or operator of any "facility or activity" subject to regulation under the NPDES program.

Person - an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Point source - any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Pollutant - dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water.

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 an impairment in a State's 303(d) list.

Redevelopment – for the purposes of part 2.3.6., any construction, land alteration, or improvement of impervious surfaces resulting in total earth disturbances greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) that does not meet the definition of new development (see above).

Runoff coefficient - the fraction of total rainfall that will appear at the conveyance as runoff.

Site – for the purposes of part 2.3.6., the area extent of construction activities, including but not limited to the creation of new impervious cover and improvement of existing impervious cover (e.g. repaving not covered by 2.3.6.a.ii.4.d.)

Small Municipal Separate Storm Sewer System – all separate storm sewer systems that are (i) owned or operated by the United States, a State, City, City, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district, or drainage district, or similar entity or an Indian tribe or an authorized Indian tribal organization or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States, and (ii) not defined as "large"
or "medium" municipal separate storm sewer system pursuant to paragraphs 40 CFR 122.26 (b)(4) and (b)(7), or designated under paragraph 40 126.26(a) (1)(v). This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or

prison complexes, and highways and other thoroughfares. This term does not include separate storm sewers in very discrete areas, such as individual buildings.

Small MS4 – means a small municipal separate storm sewer system.

Stormwater - stormwater runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Discharges Associated with Construction Activity - a discharge of pollutants in stormwater runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavating), construction materials, or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located. (See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15).

Stormwater Discharges Associated with Industrial Activity - the discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under Part 122. For the categories of industries identified in this section, the term includes, but is not limited to, stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste water (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with stormwater drained from the above described areas. Industrial facilities include those that are federally, State, or municipally owned or operated that meet the description of the facilities listed in Appendix D of this permit. The term also includes those facilities designated under the provisions of 40 CFR 122.26(a)(1)(v).

Total Maximum Daily Loads (TMDLs) - A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL includes wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources and/or natural background, and must include a margin of safety (MOS) and account for seasonal variations. (See section 303(d) of the Clean Water Act and 40 CFR 130.2 and 130.7).

Urbanized Area – US Census designated area comprised of a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core. For the purposes of

this permit, Urbanized Areas as defined by any Census since 2000 remain subject to stormwater regulation even if there is a change in the reach of the Urbanized Area because of a change in more recent Census
data.

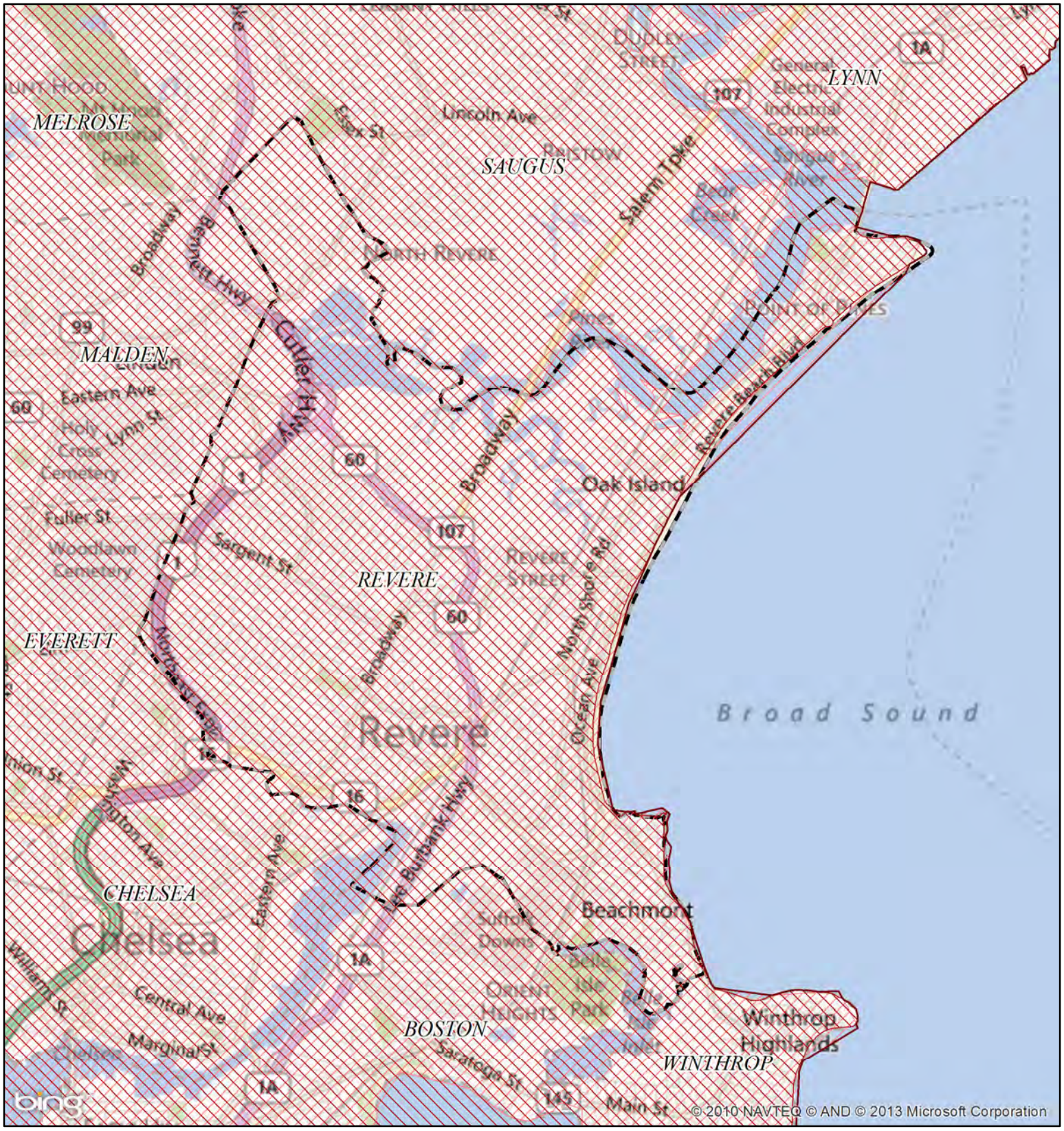
Water Quality Limited Water – for the purposes of this permit, a water quality limited water is any waterbody that does not meet applicable water quality standards, including but not limited to waters listed in categories 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b).

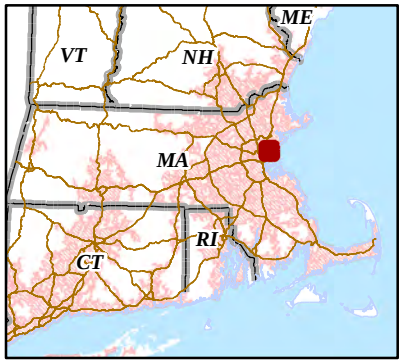
Water Quality Standards - A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States and EPA adopt WQS to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act (See CWA sections 101(a)2 and 303(c)).

ABBREVIATIONS AND ACRONYMS
BMP – Best Management Practice
BPJ – Best Professional Judgment
CGP – Construction General Permit
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)
DCIA – Directly Connected Impervious Area
EPA – U. S. Environmental Protection Agency
ESA – Endangered Species Act
USFWS – U. S. Fish and Wildlife Service
IA – Impervious Area
IDDE – Illicit Discharge Detection and Elimination
LA – Load Allocations
MS4 – Municipal Separate Storm Sewer System
MSGP – Multi-Sector General Permit
NHPA – National Historic Preservation Act
NMFS – U. S. National Marine Fisheries Service
NOI – Notice of Intent
NPDES – National Pollutant Discharge Elimination System
NRHP – National Register of Historic Places
NSPS – New Source Performance Standard
PCP – Phosphorus Control Plan
SHPO – State Historic Preservation Officer
SPCC – Spill Prevention, Control, and Countermeasure
SWMP – Stormwater Management Program
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
TSS – Total Suspended Solids
WLA – Wasteload Allocation
WQS – Water Quality Standard

APPENDIX B

Regulated Area Map





NPDES Phase II Stormwater Program
Automatically Designated MS4 Areas

Revere MA

Regulated Area:

UA Based on 2000 Census | UA Based on 2010 Census

0 1 2 Kilometers

0 1 2 Miles

Town Population: 51687

Regulated Population: 51687

(Populations estimated from 2010 Census)

EPA

Urbanized Areas, Town Boundaries:
US Census (2000, 2010)
Base map © 2013 Microsoft Corporation
and its data suppliers

US EPA Region 1 GIS Center Map #8824, 8/9/2013

APPENDIX C

2016 MS4 Permit

Minor Permit Modification Summary

The following permit has been modified in accordance with 40 CFR §122.63:

Permit Name: GENERAL PERMITS FOR STORMWATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS IN MASSACHUSETTS

Issue date: April 4, 2016

Effective Date: July 1, 2018

The following minor modifications were made on November 7, 2018**:**

Page	Modification
2	Table of Contents was updated to reflect the changes below
3	Table of Contents was updated to reflect the changes below
5	Line was added before first bullet point for consistency
6	Line was removed between parts for consistency
8	Lines were added and removed between parts for consistency
8	Typos were fixed
11	Extra word was removed
11	Extra spaces were removed between words for consistency
12	Extra spaces were removed between words for consistency
12	Extra words were removed
12	Text was moved to a bullet point in the last paragraph of part 1.10.2 instead of as part of the 1.10.3 title for consistency
12	Duplicate words and symbols were deleted
13	Bullets were moved to the correct subsection, consistent with other relevant sections of the permit
14	Typos were fixed
15	Extra spaces were removed between words for consistency
16	Extra spaces were removed between words for consistency
27	Extra spaces were removed between words for consistency
27	Duplicate character was removed
29	Typo was fixed
30	Duplicate character was removed
32	Lines were added before bullet points for consistency
33	Lines were added and removed between paragraphs for consistency
34	Line was added before bullet points for consistency
34	Typo was fixed
34	Duplicate spaces were removed
35	Typo was fixed
35	Line was added before bullet points for consistency
36	Lines were added before bullet points and in between parts for consistency
37	Lines were added before bullet points and in between parts for consistency
38	Line was added in between parts for consistency
38	Typos were fixed

39	Line was added in between paragraphs for consistency
39	Typos were fixed
41	Lines were added before bullets for consistency
42	Typos were fixed
43	Typo was fixed
44	Line was added for consistency
46	Typo was fixed
50	Typo was fixed
51	Typo was fixed
54	Line was added for consistency
55	Line was added for consistency
56	Typo was fixed
56	Line was added for consistency
57	Lines were added and removed for consistency

United States Environmental Protection Agency (EPA)
National Pollutant Discharge Elimination System (NPDES)

GENERAL PERMITS FOR STORMWATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS IN MASSACHUSETTS

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act (CWA), as amended (33 U.S.C. §1251 *et seq.*), and the Massachusetts Clean Waters Act, as amended (M.G.L. Chap.21 §§ 26-53), any operator of a small municipal separate storm sewer system whose system:

- Is located in the areas described in part 1.1;
- Is eligible for coverage under part 1.2 and part 1.9; and
- Submits a complete and accurate Notice of Intent in accordance with part 1.7 of this permit and EPA issues a written authorization

is authorized to discharge in accordance with the conditions and the requirements set forth herein.

The following appendices are also included as part of these permits:
Appendix A – Definitions, Abbreviations, and Acronyms;
Appendix B – Standard permit conditions applicable to all authorized discharges;
Appendix C – Endangered Species Act Eligibility Guidance;
Appendix D – National Historic Preservation Act Eligibility Guidance;
Appendix E – Information required for the Notice of Intent (NOI);
Appendix F – Requirements for MA Small MS4s Subject to Approved TMDLs;
Appendix G – Impaired Waters Monitoring Parameter Requirements;
Appendix H – Requirements related to discharges to certain water quality limited waterbodies;

These permits become effective on **July 1, 2017**.

These permits and the authorization to discharge expire at midnight, **June 30, 2022**.

Signed this 4th day of April, 2016

Ken Moraff, Director
Office of Ecosystem Protection
United States Environmental Protection Agency
5 Post Office Square – Suite 100
Boston, Massachusetts 02109-3912

Signed this 4th day of April 2016

Douglas E. Fine
Assistant Commissioner for Water Resources
Department of Environmental Protection
One Winter Street
Boston, Massachusetts 02108

TABLE OF CONTENTS

1.0. Introduction

This document consists of three (3) general permits listed in part 1.1. Each general permit is applicable to a particular type of municipal system within Massachusetts. Many of the permit terms and conditions are applicable across all regulated entities, and therefore are presented just once in parts 1-2, part 4, and Appendices A through E. Other conditions are applicable to a particular set of authorized entities; these terms and conditions are included in parts 3, and 5 and Appendices F through H. Throughout the permit, the terms "this permit" or "the permit" will refer to the three general permits.

1.1. Areas of Coverage

This permit covers small municipal separate storm sewer systems (MS4s) located in the Commonwealth of Massachusetts:

- Traditional Cities and Towns (NPDES Permit No. MAR041000)
- State, federal, county and other publicly owned properties (Non-traditional) (MAR042000)
- State transportation agencies (except for MassDOT- Highway Division) (MAR043000)

1.2. Eligibility

The MS4 shall meet the eligibility provisions described in part 1.2.1 and part 1.9 to be eligible for authorization under this permit.

1.2.1. Small MS4s Covered

This permit authorizes the discharge of stormwater from small MS4s as defined at 40 CFR § 122.26(b) (16). This includes MS4s described in 40 CFR §122.32(a) (1) and (a) (2). An MS4 is eligible for coverage under this permit if it is:

- A small MS4 within the Commonwealth of Massachusetts;
- Not a large or medium MS4 as defined in 40 CFR §§122.26(b)(4) or (7);
- Located either fully or partially within an urbanized area as determined by the latest Decennial Census by the Bureau of Census as of the effective date of this permit (the 2010 Census); or
- Located in a geographic area designated by EPA as requiring a permit.

If the small MS4 is not located entirely within an urbanized area, only the portion of the MS4 that is located within the urbanized area is regulated under 40 CFR §122.32(a) (1).

A small municipal separate storm sewer system means all separate storm sewers that are:

- Owned or operated by the United States, a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States.
- Not defined as large or medium municipal separate storm sewer systems pursuant to 40 CFR § 122.26(b) (4) and (b) (7) or designated under 40 CFR § 122.26(a) (1) (v).
- This term includes systems similar to separate storm sewer systems in municipalities such as systems at military bases, large hospitals or prison complexes, and highways

and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

1.3. Limitations on Coverage

This permit does not authorize the following:

a. Stormwater discharges mixed with sources of non-stormwater unless such non-stormwater discharges are:

- Authorized under a separate NPDES permit; or
- A non-stormwater discharge as listed in part 1.4.

b. Stormwater discharges associated with industrial activity as defined in 40 CFR §122.26 (b) (14) (i)-(ix) and (xi).

c. Stormwater discharges associated with construction activity as defined in 40 CFR §122.26(b) (14) (x) or (b) (15).

d. Stormwater discharges currently authorized under another NPDES permit, including discharges covered under other regionally issued general permits.

e. Stormwater discharges or discharge related activities that are likely to adversely affect any species that are listed as endangered or threatened under the Endangered Species Act (ESA) or result in the adverse modification or destruction of habitat that is designated as critical under the ESA. The permittee shall follow the procedures detailed in Appendix C to make a determination regarding eligibility. The permittee shall certify compliance with this provision on the submitted NOI.

f. Stormwater discharges whose direct or indirect impacts do not prevent or minimize adverse effects on any Essential Fish Habitat.

g. Stormwater discharges, or implementation of a stormwater management program, which adversely affects properties listed or eligible to be listed on the National Register of Historic Places. The permittee shall follow the procedures detailed in Appendix D to make a determination regarding eligibility. The permittee shall certify compliance with this provision on the submitted NOI.

h. Stormwater discharges prohibited under 40 CFR § 122.4.

i. Stormwater discharges to the subsurface subject to state Underground Injection Control (UIC) regulations. Although the permit includes provisions related to infiltration and groundwater recharge, structural controls that dispose of stormwater into the ground may be subject to UIC regulation requirements. Authorization for such discharges shall be obtained from Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program, Underground Injection Control, One Winter Street, Boston, MA 02108 – phone 617-292-5859.

j. Any non-traditional MS4 facility that is a "new discharger" as defined in part 5.1.4. and discharges to a waterbody listed in category 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) due to nutrients (Total Nitrogen or (Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enteroccus or Fecal Coliform), chloride (Chloride) or oil and grease

(Petroleum Hydrocarbons or Oil and Grease), or discharges to a waterbody with an approved TMDL for any of those pollutants.

1.4. Non-Stormwater Discharges

The following categories of non-stormwater discharges are allowed under this permit *unless* the permittee, EPA, or the MassDEP identifies any category or individual discharge of non-stormwater discharge in part 1.4.a-r as a significant contributor of pollutants to the MS4, then that category or individual discharge is not allowed under part 1.4, but rather shall be deemed an "illicit discharge" under part 2.3.4.1, and the permittee shall address that category or individual discharge as part of the Illicit Discharge Detection and Elimination (IDDE) Program described in part 2.3.4 of this permit.

a. Water line flushing
b. Landscape irrigation
c. Diverted stream flows
d. Rising ground water
e. Uncontaminated ground water infiltration (as defined at 40 CFR § 35.2005(20))
f. Uncontaminated pumped ground water
g. Discharge from potable water sources
h. Foundation drains
i. Air conditioning condensation
j. Irrigation water, springs
k. Water from crawl space pumps
l. Footing drains
m. Lawn watering
n. Individual resident car washing
o. Flows from riparian habitats and wetlands
p. De-chlorinated swimming pool discharges
q. Street wash waters
r. Residential building wash waters without detergents

Discharges or flows from firefighting activities are allowed under this permit need only be addressed where they are identified as significant sources of pollutants to waters of the United States.

1.5. Permit Compliance

Non-compliance with any of the requirements of this permit constitutes a violation of the permit and the CWA and may be grounds for an enforcement action and may result in the imposition of injunctive relief and/or penalties.

1.6. Continuation of this Permit

If this permit is not reissued prior to the expiration date, it will be administratively continued in accordance with the Administrative Procedure Act and remain in force and effect for discharges that were authorized prior to expiration. If a small MS4 was granted permit authorization prior to the expiration date of this permit, it will automatically remain authorized by this permit until the earliest of:

- Authorization under a reissued general permit following timely and appropriate submittal of a complete and accurate NOI requesting authorization to discharge under the reissued permit; or
- Issuance or denial of an individual permit for the MS4's discharges; or

- Authorization or denial under an alternative general permit.

If the MS4 operator does not submit a timely, appropriate, complete, and accurate NOI requesting authorization to discharge under the reissued permit or a timely request for authorization under an individual or alternative general permit, authorization under this permit will terminate on the due date for the NOI under the reissued permit unless otherwise specified in the reissued permit.

1.7. Obtaining Authorization to Discharge

1.7.1. How to Obtain Authorization to Discharge

To obtain authorization under this permit, a small MS4 shall:

- Be located in the areas listed in part 1.1 of this permit;
- Meet the eligibility requirements in part 1.2 and part 1.9;
- Submit a complete and accurate Notice of Intent (NOI) in accordance with the requirements of part 1.7.2; and
- EPA issues a written authorization.

1.7.2. Notice of Intent

a. Operators of Small MS4s seeking authorization to discharge under the terms and conditions of this permit shall submit a Notice of Intent that contains the information identified in Appendix E. This includes operators of small MS4s that were previously authorized under the May 1, 2003 small MS4 general permit (MS4-2003 permit).

b. The NOI shall be signed by an appropriate official (see Appendix B, Subparagraph B.11, Standard Conditions).

c. The NOI shall contain the following certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print the name and title of the official, followed by signature and date.

d. The NOI shall be submitted within 90 days of the effective date of the permit. If EPA notifies an MS4 that it is designated under 40 CFR § 122.32(a) (2) or (b), the NOI shall be submitted within 180 days of receipt of notice unless granted a longer period of time by EPA.

1.7.3. Submission of Notice of Intent

a. All small MS4s shall submit a complete and accurate Notice of Intent (suggested form in Appendix E) to EPA-Region 1 at the following address:

United States Environmental Protection Agency
Stormwater and Construction Permits Section (OEP06-1)
Five Post Office Square, Suite 100

Boston, MA 02109

Or submitted electronically to EPA at the following email address: stormwater.reports@epa.gov

b. All small MS4s shall also submit a copy of the NOI to the MassDEP at the following address:

Massachusetts Department of Environmental Protection
One Winter Street -5th Floor
Boston, Massachusetts 02108
ATTN: Frederick Civian, Stormwater Coordinator

c. Late notification: A small MS4 is not prohibited from submitting a NOI after the dates provided in part 1.7.2.d. However, if a late NOI is submitted, authorization is only for discharges that occur after permit authorization is granted. EPA and MassDEP reserve the right to take enforcement actions for any unpermitted discharges. All NOIs submitted after December 21, 2020 must be submitted electronically.

1.7.4. Public Notice of NOI and Effective Date of Coverage

a. EPA will provide a public notice and opportunity for comment on the contents of the submitted NOIs. The public comment period will be a minimum of 30 calendar days.

b. Based on a review of a small MS4's NOI or other information, EPA may grant authorization, extend the public comment period, or deny authorization under this permit and require submission of an application for an individual or alternative NPDES permit. (See part 1.8) A small MS4 will be authorized to discharge under the terms and conditions of this permit upon receipt of notice of authorization from EPA.

c. Permittees whose authorization to discharge under the MS4-2003 permit, which expired on May 1, 2008, has been administratively continued in accordance with the Administrative Procedure Act 5 U.S.C. § 558(c) and 40 CFR § 122.6, who wish to obtain coverage under this permit, must submit a new NOI requesting permit coverage in accordance with the requirements of part 1.7 of this permit to EPA within 90 days after the effective date of this permit. Permittees whose authorization to discharge under the expired MS4-2003 permit was administratively continued, who fail to submit a timely, complete and accurate NOI or an application for an individual NPDES permit within 90 days after the effective date of this permit will be considered to be discharging without a permit (see 40 CFR § 122.28(b)(3)(iii)).

1.8. Individual Permits and Alternative General Permits

a. EPA may require a small MS4 to apply for and obtain authorization under either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition EPA in accordance with the provisions of 40 CFR § 122.26(f) to require a small MS4 to apply for and/or obtain authorization under either an individual NPDES permit or an alternative NPDES general permit. If EPA requires a small MS4 to apply for an individual or alternative NPDES permit, EPA will notify the small MS4 in writing that a permit application is required. This notification will include a brief statement of the reasons for this decision and will provide application information and an application deadline. If a small MS4 is authorized under the MS4-2003 permit or this permit and fails to submit an individual NPDES or an alternative general permit NPDES permit application as required by EPA, then the authorization under the MS4-2003 permit or this permit to the small MS4 is automatically terminated at the end of the date specified by EPA as the deadline

for application submittal. EPA reserves the right to take enforcement action for any unpermitted discharge.

b. A small MS4 may request to be excluded from this general permit by applying for an individual permit or authorization under an alternative general permit. In such a case, a small MS4 shall submit an individual permit application in accordance with the requirements of 40 CFR § 122.33(b) (2) (i) or § 122.33(b) (2) (ii), with reasons supporting the request, to EPA at the address listed in part 1.7.3 of this permit. The request may be granted by issuance of an individual permit or authorization under an alternative general permit if EPA determines that the reasons stated by the small MS4 are adequate to support the request. (See 40 CFR § 122.28(b) (3)).

c. When an individual NPDES permit is issued, or a small MS4 is authorized to discharge under an alternative NPDES general permit, authorization under this permit automatically terminates on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit.

1.9. Special Eligibility Determinations

1.9.1. Documentation Regarding Endangered Species

The small MS4 shall certify eligibility regarding endangered species in the NOI required by part 1.7.2. The Stormwater Management Program (SWMP) shall include documentation supporting the permittee's eligibility determination with regard to federal Endangered and Threatened Species and Critical Habitat Protection, including:

- Results of the Appendix C U.S. Fish and Wildlife Service endangered species screening determination; and
- If applicable, a description of the measures the small MS4 shall implement to protect federally listed endangered or threatened species, or critical habitat, including any conditions imposed by the U.S. Fish and Wildlife Service. If a permittee fails to document and implement such measures, the permittee's discharges are ineligible for coverage under this permit.

1.9.2. Documentation Regarding Historic Properties

The small MS4 shall certify eligibility regarding historic properties on the NOI required by part 1.7.2. The SWMP shall include documentation supporting the small MS4's eligibility determination with regard to Historic Properties Preservation, including:

- Information on whether the permittee's stormwater discharges, allowable non-stormwater discharges, or stormwater discharge-related activities would have an effect on a property that is listed or eligible for listing on the National Register of Historic Properties (NRHP);
- Where such effects may occur, any documents received by the permittee or any written agreements the permittee has made with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), or other Tribal representative to mitigate those effects;
- Results of the Appendix D historic property screening investigations; and
- If applicable, a description of the measures the permittee shall implement to avoid or minimize adverse impacts on places listed, or eligible for listing, on the NRHP, including any conditions imposed by the SHPO or THPO. If the permittee fails to

document and implement such measures, those discharges are ineligible for coverage under this permit.

1.10. Stormwater Management Program (SWMP)

a. The permittee shall develop and implement a written (hardcopy or electronic) SWMP. The SWMP shall be signed in accordance with Appendix B, Subsection 11, including the date of signature. A signature and date is required for initial program preparation and for any significant revision to the program, which shall be in writing. The written SWMP shall be completed within one (1) year of the effective date of the permit.

The SWMP is the document used by the permittee to describe and detail the activities and measures that will be implemented to meet the terms and conditions of the permit. The SWMP shall accurately describe the permittees plans and activities. The document should be updated and/or modified during the permit term as the permittee's activities are modified, changed or updated to meet permit conditions during the permit term.

b. Permittees authorized by the MS4-2003 permit shall modify or update their existing Best Management Practices (BMPs) and measurable goals to meet the terms and conditions of part 2.3 of this permit within one (1) year of the effective date of the permit. These modifications and updates shall be reflected in the written (hardcopy or electronic) SWMP. Permittees authorized by the MS4-2003 permit shall continue to implement their existing SWMP until the program has been updated.

1.10.1. Stormwater Management Program Availability

a. The permittee shall retain a copy of the current SWMP required by this permit at the office or facility of the person listed as the program contact on the submitted Notice of Intent (NOI). The SWMP shall be immediately available to representatives from EPA, MassDEP, U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) at the time of an onsite inspection or upon request.

b. The permittee shall make the SWMP available to the public during normal business hours. The permittee shall also post the SWMP online[1] if the permittee has a website on which to post the SWMP.

1.10.2. Contents and Timelines of the Stormwater Management Program for 2003 permittees

The following information must be included in the SWMP within one (1) year of the permit effective date and updated annually thereafter, as necessary:

- Identification of names and titles of people responsible for program implementation. If a position is currently unfilled, list the title of the position and modify the SWMP with the name once the position is filled;
- Documentation of compliance with part 1.9.1;
- Documentation of compliance with part 1.9.2;

[1] Should a permittee not wish to post mapping information included in the SWMP (see part 1.10.2) on their website for public safety reasons, they must state the reason either with or within the online SWMP and provide how the MS4 mapping information can be obtained. The permittee must retain the entire SWMP, including all completed mapping, at a location where it can be made available to the public during normal business hours.

- Documentation of authorization of all new or increased discharges granted by MassDEP in compliance with part 2.1.2;
- Listing of all discharges identified pursuant to part 2.1.1 and description of response;
- Description of practices to achieve compliance with part 2.3 (MEP requirements) identified in the permittee's NOI and any updates to those BMPs within the first year;
  For each permit condition in part 2.3 identify:
  - The person(s) or department responsible for the measure;
  - The BMPs for the control measure or permit requirement;
  - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal shall have a measure of assessment associated with it;
- Sanitary Sewer Overflow (SSO) inventory including all of the information required in part 2.3.4.4.b;
- Written IDDE Program pursuant to part 2.3.4.6;
- Written procedures for site inspections and enforcement of sediment and erosion control procedures in accordance with part 2.3.5;
- Description of measures to avoid or minimize impacts to surface public drinking water supply sources. The permittee is also encouraged to include provisions to notify public water supplies in the event of an emergency. Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program, One Winter Street, Boston, MA 02108 – phone 617.292.5770.
- Description of activities to achieve compliance with part 3.0;
- Annual program evaluation (part 4.1). Update annually and maintain copies.

The following information must be included in the SWMP within two (2) years of the permit effective date and updated annually thereafter, as necessary:

- Listing of all receiving waterbody segments, their classification under the applicable state water quality standards, any impairment(s) and associated pollutant(s) of concern, applicable TMDLs and WLAs, and number of outfalls from the MS4 that discharge to each waterbody. In addition to the receiving water, the permittee shall document in the SWMP all surface public drinking water sources that may be impacted by MS4 discharges;
- Listing of all interconnected MS4s and other separate storm sewer systems receiving a discharge from the permitted MS4, the receiving waterbody segment(s) ultimately receiving the discharge, their classification under the applicable state water quality standards, any impairment(s) and associated pollutant(s) of concern, applicable TMDLs and WLAs, and the number of interconnections;
- Written procedures to require submission of as-built drawings and ensure long term operation and maintenance in accordance with part 2.3.6.a.iii;
- The map of the separate storm sewer system required by part 2.3.4.5.

The following information must be included in the SWMP within four (4) years of the permit effective date and updated annually thereafter, as necessary:

- Report(s) assessing current street design and parking lot guidelines and other local requirements within the municipality that affect the creation of impervious cover.

The following information must be included in the SWMP concurrent with the applicable

deadlines in Appendix F and H and updated annually thereafter, as necessary:

- Description of practices to achieve compliance with part 2.2.1 (TMDL requirements) including:
  - The person(s) or department responsible for the measure;
  - The BMPs for the control measure or permit requirement;
  - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal must have an associated measure of assessment.
- Description of practices to achieve compliance with part 2.2.2 (discharges to certain water quality limited waters subject to additional requirements) including:
  - The person(s) or department responsible for the measure;
  - The BMPs for the control measure or permit requirement;
  - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal must have an associated measure of assessment;
- Description of any other practices to achieve compliance with part 2.1 (water quality based requirements)

1.10.3. Contents and Timelines of the Stormwater Management Program for New Permittees

a. Permittees seeking authorization for the first time shall meet all deadlines contained in this permit except the following:

- Timelines for public education requirements in part 2.3.2.c shall be extended by one (1) year and need to include one (1) message to each audience over the permit term;
- The ordinances, by-laws, or other regulatory mechanisms required by parts 2.3.4, 2.3.5 and 2.3.6 shall be completed as soon as possible, but no later than three (3) years from the permit effective date; and
- All other deadlines in part 2.3.4 shall be extended by three (3) years.
- All other deadlines in part 2.3.5, 2.3.6 and 2.3.7 shall be extended by two (2) years.
- All deadlines for discharges to water quality limited waters without a TMDL under part 2.2.2 shall be extended by two (2) years.

b. Contents of the Stormwater Management Program for New Permittees

The following information must be included in the SWMP within one (1) year of the permit effective date and updated annually thereafter, as necessary:

- Identification of names and titles of people responsible for program implementation. If a position is currently unfilled, list the title of the position and modify the SWMP with the name once the position is filled;
- Documentation of compliance with part 1.9.1;
- Documentation of compliance with part 1.9.2;
- Documentation of authorization of all new or increased discharges granted by MassDEP in compliance with part 2.1.2;
- Listing of all discharges identified pursuant to part 2.1.1 and description of response;
- Description of practices to achieve compliance with part 2.3 (MEP requirements) identified in the permittee's NOI and any updates to those BMPs within the first year;

For each permit condition in part 2.3 identify:
- The person(s) or department responsible for the measure;
- The BMPs for the control measure or permit requirement;
- The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal shall have a measure of assessment associated with it;

- Description of measures to avoid or minimize impacts to surface public drinking water supply sources. The permittee is also encouraged to include provisions to notify public water supplies in the event of an emergency. Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program, One Winter Street, Boston, MA 02108 – phone 617.292.5770. Description of activities to achieve compliance with part 3.0;
- Annual program evaluation (part 4.1). Update annually and maintain copies.

The following information must be included in the SWMP within three (3) years of the permit effective date and updated annually thereafter, as necessary:

- Written procedures for site inspections and enforcement of sediment and erosion control procedures in accordance with part 2.3.5;

The following information must be included in the SWMP within four (4) years of the permit effective date and updated annually thereafter, as necessary:

- Outfall and interconnection inventory;
- Sanitary Sewer Overflow (SSO) inventory including all of the information required in part 2.3.4.4.b;
- Written IDDE Program pursuant to part 2.3.4.6.
- Written operation and maintenance procedures for municipal activities in part 2.3.7.a.ii;
- Written program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4 in accordance with part 2.3.7.a.iii.1;
- Written procedures to require submission of as-built drawings and ensure long term operation and maintenance in accordance with part 2.3.6.a.iii;

The following information must be included in the SWMP within five (5) years of the permit effective date and updated annually thereafter, as necessary:

- Phase 1 of the map of the separate storm sewer system required by part 2.3.4.5;
- Listing of all receiving waterbody segments, their classification under the applicable state water quality standards, any impairment(s) and associated pollutant(s) of concern, applicable TMDLs and WLAs, and number of outfalls from the MS4 that discharge to each waterbody. In addition to the receiving water, the permittee shall document in the SWMP all surface public drinking water sources that may be impacted by MS4 discharges;
- Listing of all interconnected MS4s and other separate storm sewer systems receiving a discharge from the permitted MS4, the receiving waterbody segment(s) ultimately receiving the discharge, their classification under the applicable state water quality standards, any impairment(s) and associated pollutant(s) of concern, applicable TMDLs and WLAs, and the number of interconnections;

The following information must be included in the SWMP within six (6) years of the permit effective date and updated annually thereafter, as necessary:

- Report(s) assessing current street design and parking lot guidelines and other local requirements within the municipality that affect the creation of impervious cover.

The following information must be included in the SWMP concurrent with the applicable deadlines in Appendix F and H (extended by two (2) years) and updated annually thereafter, as necessary:

- Description of practices to achieve compliance with part 2.2.1 (discharges subject to requirements related to approved TMDLs)including:
  - The person(s) or department responsible for the measure;
  - The BMPs for the control measure or permit requirement;
  - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal must have an associated measure of assessment.
- Description of practices to achieve compliance with part 2.2.2 (discharges to certain water quality limited waters subject to additional requirements) including:
  - The person(s) or department responsible for the measure;
  - The BMPs for the control measure or permit requirement;
  - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal must have an associated measure of assessment;
- Description of any other practices to achieve compliance with part 2.1 (water quality based requirements).

2.0. Non-Numeric Effluent Limitations

The permittee shall develop, implement, and enforce a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; to protect water quality and to satisfy the appropriate water quality requirements of the Clean Water Act and the Massachusetts Water Quality Standards.

2.1. Water Quality Based Effluent Limitations

Pursuant to Clean Water Act 402(p)(3)(B)(iii), this permit includes provisions to ensure that discharges from the permittee's small MS4 do not cause or contribute to an exceedance of water quality standards, in addition to requirements to reduce the discharge of pollutants to the maximum extent practicable. The requirements found in this part and part 2.2 constitute appropriate water quality based effluent limits of this permit. Requirements to reduce the discharge of pollutants to the maximum extent practicable are set forth in part 2.3.

2.1.1. Requirement to Meet Water Quality Standards

a. The permittee shall reduce the discharge of pollutants such that the discharges from the MS4 do not cause or contribute to an exceedance of water quality standards.

b. If there is a discharge from the MS4 to a waterbody (or its tributaries in some cases) that is subject to an approved TMDL identified in part 2.2.1, the permittee is subject to the requirements of part 2.2.1 and Appendix F of this permit and the permittee shall comply with all applicable schedules and requirements in Appendix F. A permittee's compliance with all applicable requirements and BMP implementation schedules in Appendix F applicable to it will constitute compliance with part 2.1.1.a. of the Permit.

c. If there is a discharge from the MS4 to a waterbody (or its tributaries in some cases) that is water quality limited (see definition in Appendix A) due to nutrients (Total Nitrogen or Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride) or oil and grease (Petroleum Hydrocarbons or Oil and Grease) and is not subject to an approved TMDL, or the MS4 is located within a municipality listed in part 2.2.2.a.-b., the permittee is subject to the requirements of part 2.2.2 and Appendix H of this permit and the permittee shall comply with all applicable schedules and requirements in Appendix H. A permittee's compliance with all applicable requirements and BMP implementation schedules in Appendix H applicable to it will constitute compliance with part 2.1.1.a. of the Permit.

d. Except where a pollutant of concern in a discharge is subject to the requirements of part 2.2.1 and/or part 2.2.2 of this permit or is the result of an illicit discharge and subject to part 2.3.4 of this Permit, if a pollutant in a discharge from the MS4 is causing or contributing to a violation of applicable water quality criteria[2] for the receiving water, the permittee shall, as expeditiously as possible, but no later than 60 days of becoming aware of the situation, reduce or eliminate the pollutant in its discharge such that the discharge meets applicable water quality criteria.

2.1.2. Increased Discharges

a. Any increased discharge, including increased pollutant loading(s) through the MS4 to waters of the United States is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for increased discharges where appropriate[3]. Any authorization of an increased discharge by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements.

b. There shall be no increased discharges, including increased pollutant loading(s) from the MS4 to impaired waters listed in categories 5 or 4b on the most recent Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) unless the permittee demonstrates that there is no net increase in loading from the MS4 to the impaired water of the pollutant(s) for which the waterbody is impaired. The permittee may demonstrate compliance with this provision by *either:*

i. Documenting that the pollutant(s) for which the waterbody is impaired is not present in the MS4's discharge and retaining documentation of this finding with the SWMP; or

[2] Applicable water quality criteria are part of 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/

[3] Contact MassDEP for guidance on compliance with 314 CMR 4.04

ii. Documenting that the total load of the pollutant(s) of concern from the MS4 to any impaired portion of the receiving water will not increase as a result of the activity and retaining documentation of this finding in the SWMP. Unless otherwise determined by the Permittee, USEPA or by MassDEP that additional demonstration is necessary, compliance with the requirements of part 2.2.2 and part 2.3.6 of this Permit, including all reporting and documentation requirements, shall be considered as demonstrating no net increase as required by this part.

c. The requirements of this part are independent of permit conditions requiring reduction in discharges of pollutants as set forth in parts 2.1.1 and 2.2 (water quality based requirements) and 2.3 (requirements to reduce discharge of pollutants to the maximum extent practicable). Permittees remain subject to requirements to reduce the discharge of pollutants from the MS4 as set forth in those parts.

2.2. Discharges to Certain Impaired Waters

The permittee shall identify in the SWMP and Annual Reports all MS4 discharges, including both outfalls and interconnections to other MS4s or other separate storm sewer systems, that:

- Are subject to Total Maximum Daily Load (TMDL) related requirements as identified in part 2.2.1.
- Are subject to additional requirements to protect water quality as identified in part 2.2.2.

The discharge location from an interconnection shall be determined based on the receiving water of the outfall from the interconnected system.

2.2.1. Discharges Subject to Requirements Related to an Approved TMDL

a. "Approved TMDLs" are those that have been approved by EPA as of the date of issuance of this permit.

b. The MS4s specified below discharge to waters within Massachusetts that are subject to TMDLs, or in some cases, to tributaries of such waters, and shall comply with the requirements of Appendix F, part A. Appendix F identifies, by section, the provisions the permittee shall implement to be consistent with the terms of the approved TMDL. Alternatively, EPA may notify the permittee that an individual permit application is necessary in accordance with part 1.8.a.

i. The following is a list of municipalities in the Charles River Watershed:

1.

Arlington	Mendon
Ashland	Milford
Bellingham	Millis
Belmont	Natick
Brookline	Needham
Cambridge	Newton
Dedham	Norfolk

Dover	Sherborn
Foxborough	Walpole
Franklin	Waltham
Holliston	Watertown
Hopedale	Wayland
Hopkinton	Wellesley
Lexington	Weston
Lincoln	Westwood
Medfield	Wrentham
Medway	

Permittees that operate regulated MS4s located in municipalities listed above that discharge to the Charles River or its Tributaries shall meet the requirements of Appendix F, part A.I with respect to the reduction of phosphorus discharges from their MS4.

ii. The following is a list of municipalities that contain a lake or pond subject to an approved lake or pond phosphorus TMDL in the Northern Blackstone Basin, Chicopee Basin, Connecticut Basin, French Basin, Millers Basin or in the watershed of Bare Hill Pond, Flint Pond, Indian Lake, Lake Boon, Lake Quinsigamond, Leesville Pond, Salisbury Pond, Quaboag Pond or Quacumquasit Pond.

1.

Auburn	Millbury
Charlton	Oxford
Dudley	Shrewsbury
Gardner	Spencer
Grafton	Springfield
Granby	Stow
Hadley	Templeton
Harvard	Westminster
Hudson	Winchendon
Leicester	Wilbraham
Ludlow	

Permittees that operate regulated MS4s in the above municipalities that discharge to waterbodies listed on Table F-6 in Appendix F or their tributaries, and any other MS4 that discharges to waterbodies listed on Table F-6 in Appendix F or their tributaries, shall meet the requirements of Appendix F, part A.II with respect to reduction of phosphorus discharges from their MS4.

iii. The following is a list of municipalities that contain waters subject to an approved TMDL for bacteria or pathogens.

1.

Abington	Marshfield
Acushnet	Mashpee
Andover	Mattapoisett
Avon	Medfield
Barnstable	Medway
Bedford	Melrose
Bellingham	Mendon
Belmont	Milford
Berkley	Millis
Beverly	Milton
Billerica	Nahant
Bourne	Natick
Brewster	Needham
Bridgewater	New Bedford
Brockton	Newton
Brookline	Norfolk
Burlington	North Andover
Cambridge	Norton
Canton	Norwell
Chatham	Norwood
Cohasset	Orleans
Concord	Peabody
Danvers	Pembroke
Dartmouth	Plymouth
Dedham	Raynham
Dennis	Rehoboth
Dighton	Revere
Dover	Rockland
Duxbury	Rockport
East Bridgewater	Salem
Eastham	Sandwich
Essex	Saugus
Everett	Scituate
Fairhaven	Seekonk
Fall River	Sharon
Falmouth	Sherborn
Foxborough	Somerset
Franklin	Stoughton

Freetown	Swampscott
Gloucester	Swansea
Hanover	Taunton
Hanson	Tewksbury
Harwich	Wakefield
Holliston	Walpole
Hopedale	Waltham
Hopkinton	Wareham
Ipswich	Watertown
Kingston	Wellesley
Lawrence	Wellfleet
Lexington	West Bridgewater
Lincoln	Weston
Lynn	Westport
Lynnfield	Westwood
Malden	Whitman
Manchester	Wilmington
Mansfield	Winthrop
Marblehead	Yarmouth
Marion	

The operators of MS4s located in municipalities listed above that discharge to a waterbody segment listed on Table F-8 in Appendix F and any other MS4 that discharges directly to a waterbody segment listed on Table F-8 in Appendix F shall meet the requirements of Appendix F, part A.III with respect to reduction of bacteria/pathogens discharges from their MS4.

iv. The following is a list of municipalities located on Cape Cod that contain waters subject to an approved TMDL for nitrogen (Total Nitrogen).

1.

Bourne
Barnstable
Chatham
Falmouth
Harwich
Mashpee
Orleans
Yarmouth

Permittees that operate regulated MS4s located in the municipalities above that discharge to waterbodies found on Table F-9 in Appendix F or their tributaries and any other MS4 that discharges to waterbodies found on Table F-9 in Appendix F or their

tributaries shall meet the requirements of Appendix F, part A.IV with respect to reduction of nitrogen discharges from their MS4.

v. The following is a list of municipalities located in the Assabet River Watershed:

1.

Acton	Hudson
Berlin	Littleton
Bolton	Marlborough
Boxborough	Maynard
Boylston	Northborough
Ca rlisle	Shrewsbury
Clinton	Stow
Concord	Westborough
Grafton	Westford
Harvard	

Permittees that operate regulated MS4s located in the municipalities above that discharge to the Assabet River or its tributaries shall meet the requirements of Appendix F part A.V with respect to reduction of phosphorus discharges from their MS4.

c. The MS4s specified below discharge to waters, or tributaries of waters, that have been identified in an adjacent state's approved TMDL as being impaired due, in part, to MS4 stormwater discharges in Massachusetts, and shall comply with the requirements of Appendix F, part B. Appendix F identifies, by section, the provisions the permittee shall implement to be consistent with the reasonable assumptions related to Massachusetts MS4 discharges. Alternatively, EPA may notify the permittee that an individual permit application is necessary in accordance with part 1.8.a.

i. The following is a list of municipalities in Massachusetts located in the watershed of Long Island Sound, which has an approved TMDL for nitrogen (Total Nitrogen).

1.

Adams	North Adams
Agawam	Northampton
Amherst	Oxford
Ashburnham	Palmer
Ashby	Paxton
Auburn	Pelham
Belchertown	Pittsfield
Charlton	Richmond
Cheshire	Russell
Chicopee	Rutland
Dalton	South Hadley
Douglas	Southampton

Dudley	Southbridge
East Longmeadow	Southwick
Easthampton	Spencer
Gardner	Springfield
Granby	Sturbridge
Hadley	Sutton
Hampden	Templeton
Hatfield	Ware
Hinsdale	Webster
Holyoke	West Springfield
Lanesborough	Westfield
Leicester	Westhampton
Lenox	Westminster
Longmeadow	Wilbraham
Ludlow	Williamsburg
Millbury	Winchendon
Monson	

Permittees that operate regulated MS4s located in the municipalities above that discharge to a water within the Connecticut River Watershed, the Housatonic River Watershed, or the Thames River Watershed shall meet the requirements of Appendix F part B. I with respect to nitrogen discharges from their MS4.

ii. The following is a list of municipalities in Massachusetts identified in a TMDL as containing MS4s contributing phosphorus to waterbody segments that have out of state approved TMDLs for phosphorus:

1.

Attleboro
North Attleborough
Plainville
Rehoboth
Seekonk
Swansea

Permittees that operate regulated MS4s located in the municipalities above that discharge to a waterbody found on Table F-12 in Appendix F or its tributaries shall meet the requirements of Appendix F part B. II with respect to phosphorus discharges from their MS4.

iii. The following is a list of municipalities in Massachusetts identified in a TMDL as containing MS4s contributing bacteria/pathogens to waterbody segments that have out of state approved TMDLs for bacteria/pathogens:

1.

Attleboro

North Attleborough
Plainville
Rehoboth
Seekonk

Permittees that operate regulated MS4s located in the municipalities above that discharge to a waterbody found on Table F-13 in Appendix F or its tributaries shall meet the requirements of Appendix F part B. III with respect to bacteria/pathogens discharges from their MS4.

iv. The following is a list of municipalities in Massachusetts identified in a TMDL as containing MS4s contributing metals (cadmium, lead, aluminum iron) to waterbody segments that have out of state approved TMDLs for metals (cadmium, lead, aluminum, iron):

1.

Attleboro
North Attleborough
Plainville
Seekonk

Permittees that operate regulated MS4s located in the municipalities above that discharge to a waterbody found on Table F-14 in Appendix F or its tributaries shall meet the requirements of Appendix F part B. IV with respect to metals discharges from their MS4.

2.2.2. Discharges to Certain Water Quality Limited Waters Subject to Additional Requirements

For purposes of this permit, a 'water quality limited water body' is any water body that does not meet applicable water quality standards, including but not limited to waters listed in categories 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b).

If there is a discharge from the MS4 to a water quality limited waterbody where pollutants typically found in stormwater (specifically nutrients (Total Nitrogen or Total Phosphorus), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enteroccus or Fecal Coliform), chloride (Chloride), metals (Cadmium, Copper, Iron, Lead or Zinc) and oil and grease (Petroleum Hydrocarbons or Oil and Grease)) are the cause of the impairment and there is not an approved TMDL, or the MS4 is located in a town listed in part 2.2.2.a.-b, the permittee shall comply with the provisions in Appendix H applicable to it.

In the absence of a defined pollutant reduction target and where no approved TMDL has been established, this permit part and Appendix H define an iterative approach addressing pollutant reductions to waterbodies where the permittee's discharge is causing or contributing to an excursion above water quality standards due to nutrients (Total Nitrogen Total Phosphorus), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enteroccus or Fecal Coliform), chloride (Chloride), metals (Cadmium, Copper, Iron, Lead or Zinc) or oil and grease (Petroleum Hydrocarbons or Oil and Grease).

a. Discharges to water quality limited waterbodies where nitrogen (Total Nitrogen) is the cause of the impairment, or their tributaries

i. The requirements of this part are applicable to:

1. Permittees (including traditional and non-traditional MS4s) that own or operate an MS4 in the following municipalities. Discharges from MS4s within these municipalities are to waterbodies that are impaired due to nitrogen (Total Nitrogen), or their tributaries.

Abington	Mattapoisett
Acushnet	Middleborough
Attleboro	New Bedford
Avon	Norton
Barnstable	Peabody
Berkley	Pembroke
Bourne	Plainville
Bridgewater	Plymouth
Brockton	Plympton
Carver	Raynham
Dartmouth	Rehoboth
Dighton	Rochester
East Bridgewater	Salem
Easton	Seekonk
Fairhaven	Sharon
Fall River	Somerset
Foxborough	Stoughton
Freetown	Swansea
Halifax	Taunton
Hanson	Wakefield
Holbrook	Wareham
Kingston	West Bridgewater
Lakeville	Westport
Lynnfield	Whitman
Mansfield	Wrentham
Marion	Yarmouth

2. Any other permittee that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to nitrogen (Total Nitrogen), or a tributary of such water.

ii. Permittees subject to part 2.2.2.a.i above shall meet the requirements of Appendix H part I with respect to the control of nitrogen discharges from their MS4;

iii. During development of their Notice of Intent, the permittee may determine that all discharges from the regulated area through their MS4 are outside of a watershed that contains a nitrogen (Total Nitrogen) impairment in a downstream segment. The permittee shall retain all documentation used in this determination as part of their NOI and are relieved from the requirements of part 2.2.2.a.i and Appendix H part I.

b. Discharges to water quality limited waterbodies where phosphorus ("Total Phosphorus") is the cause of the impairment, or their tributaries

i. The requirements of this part are applicable to:

1. Permittees (including traditional and non-traditional MS4s) that own or operate an MS4 in the following municipalities. Discharges from MS4s within these municipalities are to waterbodies that are impaired due to phosphorus (Total Phosphorus), or their tributaries.

Abington	Lynn
Acushnet	Lynnfield
Andover	Malden
Arlington	Mansfield
Ashburnham	Marlborough
Ashland	Mashpee
Auburn	Medfield
Avon	Medford
Ayer	Melrose
Barnstable	Mendon
Bedford	Methuen
Belchertown	Millbury
Belmont	Millville
Billerica	Milton
Blackstone	North Andover
Bolton	Northbridge
Brewster	Norton
Bridgewater	Norwood
Brockton	Oxford
Burlington	Peabody
Cambridge	Pembroke
Canton	Pepperell
Carlisle	Pittsfield
Carver	Quincy
Chelmsford	Randolph
Chelsea	Reading

Clinton	Revere
Concord	Rockland
Dalton	Salem
Dedham	Scituate
Douglas	Seekonk
Dover	Sharon
Dracut	Shirley
Dunstable	Shrewsbury
East Bridgewater	Somerville
Eastham	Southampton
Easthampton	Spencer
Everett	Springfield
Falmouth	Stoneham
Fitchburg	Stoughton
Foxborough	Sudbury
Framingham	Sutton
Gloucester	Taunton
Grafton	Tewksbury
Granby	Townsend
Groton	Tyngsborough
Halifax	Upton
Hanover	Uxbridge
Hanson	Wakefield
Harvard	Walpole
Haverhill	Wareham
Hinsdale	Watertown
Hopkinton	Wayland
Hudson	West Bridgewater
Lancaster	Westfield
Lawrence	Westminster
Leicester	Westwood
Lenox	Whitman
Leominster	Wilmington
Lexington	Winchendon
Littleton	Winchester
Lowell	Winthrop
Lunenburg	Woburn
Lynn	

2. Any other permittee that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to phosphorus ("Total Phosphorus"), or to a tributary of such water.

ii. The permittees subject to part 2.2.2.b.i. above shall meet all requirements of Appendix H part II with respect to the control of phosphorus discharges from the MS4.

iii. During development of their Notice of Intent, the permittee may determine that all discharges from the regulated area through their MS4 are outside of a watershed that contains a phosphorus ("Total Phosphorus") impairment in a downstream segment. The permittee shall retain all documentation used in this determination as part of their NOI and are relieved from the requirements of part 2.2.2.b.i and Appendix H part II.

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

i. The requirements of this part are applicable to:

1. Any MS4 discharge identified by the permittee on their Notice of Intent as discharging directly to an impaired waterbody on the most recent EPA approved Massachusetts 303(d) list where bacteria or pathogens (E. Coli, Enteroccus or Fecal Coliform) is the cause of the impairment.
2. Any other MS4 that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to bacteria or pathogens.

ii. The permittees subject to part 2.2.2.c.i. shall meet all requirements of Appendix H part III with respect to reduction of bacteria or pathogens discharges from the MS4.

d. Discharges to water quality limited waterbodies where chloride (Chloride) is the cause of the impairment

i. The requirements of this part are applicable to:

1. Any MS4 discharge identified by the permittee on their Notice of Intent as discharging directly to an impaired waterbody on the most recent EPA approved Massachusetts 303(d) list where chloride (Chloride) is the cause of the impairment.
2. Any other MS4 that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to chloride (Chloride).

ii. The permittees subject to part 2.2.2.d.i. shall meet all requirements of Appendix H part IV with respect to reduction of chloride discharges from the MS4.

e. Discharges to water quality limited waterbodies where oil and grease (Petroleum Hydrocarbons or Oil and Grease), solids (TSS or Turbidity) or metals (Cadmium, Copper, Iron, Lead or Zinc) is the cause of the impairment

i. The requirements of this part are applicable to:

1. Any MS4 discharge identified by the permittee on their Notice of Intent as discharging directly to an impaired waterbody on the most recent EPA

approved Massachusetts 303(d) list where oil and grease, solids or metals (Oil and Grease, Petroleum Hydrocarbons TSS, Turbidity, Cadmium, Copper, Iron, Lead or Zinc) is the cause of the impairment.

2. Any other MS4 that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to oil and grease (Petroleum Hydrocarbons or Oil and Grease), solids (TSS or Turbidity) or metals (Cadmium, Copper, Iron, Lead or Zinc).

ii. The permittees subject to part 2.2.2.d.i. shall meet all requirements of Appendix H part V with respect to reduction of solids, oil and grease or metals discharges from the MS4.

2.3. Requirements to Reduce Pollutants to the Maximum Extent Practicable (MEP)

The permittee shall reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP) as detailed in parts 2.3.2 through 2.3.7.

2.3.1. Control Measures

a. Permittees authorized under the MS4-2003 permit shall continue to implement their existing SWMPs while updating their SWMPs pursuant to this permit. This permit does not extend the compliance deadlines set forth in the MS4-2003 permit.

b. Implementation of one or more of the minimum control measures described in parts 2.3.2- 2.3.7 or other permit requirements may be shared with another entity (including another interconnected MS4) or the other entity may fully implement the measure or requirement, if the following requirements are satisfied:

- The other entity, in fact, implements the control measure.
- The particular control measure or component thereof undertaken by the other entity is at least as stringent as the corresponding permit requirement.
- The other entity agrees to implement the control measure on the permittee's behalf. The annual reports must specify that the permittee is relying on another entity to satisfy some of its permit obligations and specify what those obligations are.
- If the permittee is relying on another governmental entity regulated under 40 CFR §122 to satisfy all of its permit obligations, including the obligation to file annual reports, the permittee shall note that fact in its NOI, but is not required to file annual reports.
- The permittee remains responsible for compliance with all permit obligations if the other entity fails to implement the control measures (or component thereof). The permittee may enter into a legally binding agreement with the other entity regarding the other entity's performance of control measures, but the permittee remains ultimately responsible for permit compliance.

2.3.2. Public Education and Outreach

Objective: The permittee shall implement an education program that includes educational goals based on stormwater issues of significance within the MS4 area. The ultimate objective of a public education program is to increase knowledge and change behavior of the public so that pollutants in stormwater are reduced.

a. The permittee shall continue to implement the public education program required by the MS4-2003 permit by distributing educational material to the MS4 community. The educational program shall define educational goals, express specific messages, define the targeted audience for each message, and identify responsible parties for program implementation. If appropriate for the target audience, materials may be developed in a language other than English. At a minimum, the program shall provide information concerning the impact of stormwater discharges on water bodies within the community, especially those waters that are impaired or identified as priority waters. The program shall identify steps and/or activities that the public can take to reduce the pollutants in stormwater runoff and their impacts to the environment.

b. The educational program shall include education and outreach efforts for the following four audiences: (1) residents, (2) businesses, institutions (churches, hospitals), and commercial facilities, (3) developers (construction), and (4) industrial facilities, unless one of these audiences is not present in the MS4 community. In such a situation, the MS4 must document in both the NOI and SWMP which audience is absent from the community and no educational messages are required to that audience.

c. The permittee shall distribute a minimum of two (2) educational messages over the permit term to each audience identified in part 2.3.2.b. The distribution of materials to each audience shall be spaced at least a year apart. Educational messages may be printed materials such as brochures or newsletters; electronic materials such as websites; mass media such as newspaper articles or public service announcement (radio or cable); targeted workshops on stormwater management, or displays in a public area such as town/city hall. The permittee may use existing materials if they are appropriate for the message the permittee chooses to deliver or the permittee may develop its own educational materials. The permittee may partner with other MS4s, community groups or watershed associations to implement the education program to meet this permit requirement.

Some EPA educational materials are available at: http://cfpub.epa.gov/npstbx/index.html.

d. The permittee shall, at a minimum, consider the topics listed in part 2.3.2.d.i. – iv when developing the outreach/education program. The topics are not exclusive and the permittee shall focus on those topics most relevant to the community.

i. Residential program: effects of outdoor activities such as lawn care (use of pesticides, herbicides, and fertilizers and information on Massachusetts Regulation 331 CMR 31 pertaining to proper use of phosphorus containing fertilizers on turf grasses) on water quality; benefits of appropriate on-site infiltration of stormwater; effects of automotive work and car washing on water quality; proper disposal of swimming pool water; proper management of pet waste; maintenance of septic systems. If the small MS4 area has areas serviced by septic systems, the permittee shall consider information pertaining to maintenance of septic systems as part of its education program.

ii. Business/Commercial/Institution program: proper lawn maintenance (use of pesticides, herbicides and fertilizer, and information on Massachusetts Regulation 331 CMR 31 pertaining to proper use of phosphorus containing fertilizers on turf grasses); benefits of appropriate on-site infiltration of stormwater; building maintenance (use of detergents); use of salt or other de-icing and anti-icing materials (minimize their use); proper storage of salt or other de-icing/anti-icing materials (cover/prevent runoff to storm system and contamination to ground water); proper storage of materials (emphasize pollution prevention); proper management of waste materials and dumpsters (cover and pollution

prevention); proper management of parking lot surfaces (sweeping); proper car care activities (washing of vehicles and maintenance); and proper disposal of swimming pool water by entities such as motels, hotels, and health and country clubs (discharges must be dechlorinated and otherwise free from pollutants).

iii. Developers and Construction: proper sediment and erosion control management practices; information about Low Impact Development (LID) principles and technologies; and information about EPA's construction general permit (CGP). This education can also be a part of the Construction Site Stormwater Runoff Control measure detailed in part 2.3.5.

iv. Industrial program: equipment inspection and maintenance; proper storage of industrial materials (emphasize pollution prevention); proper management and disposal of wastes; proper management of dumpsters; minimization of use of salt or other de-icing/anti-icing materials; proper storage of salt or other de-icing/anti-icing materials (cover/prevent runoff to storm system and ground water contamination); benefits of appropriate on-site infiltration of stormwater runoff from areas with low exposure to industrial materials such as roofs or employee parking; proper maintenance of parking lot surfaces (sweeping); and requirements for coverage under EPA's Multi-Sector General Permit.

e. The program shall show evidence of focused messages for specific audiences as well as evidence that progress toward the defined educational goals of the program has been achieved. The permittee shall identify methods that it will use to evaluate the effectiveness of the educational messages and the overall education program. Any methods used to evaluate the effectiveness of the program shall be tied to the defined goals of the program and the overall objective of changes in behavior and knowledge.

f. The permittee shall modify any ineffective messages or distribution techniques for an audience prior to the next scheduled message delivery.

g. The permittee shall document in each annual report the messages for each audience; the method of distribution; the measures/methods used to assess the effectiveness of the messages, and the method/measures used to assess the overall effectiveness of the education program.

2.3.3. Public Involvement and Participation

Objective: The permittee shall provide opportunities to engage the public to participate in the review and implementation of the permittee's SWMP.

a. All public involvement activities shall comply with state public notice requirements (MGL Chapter 30A, Sections 18 – 25 – effective 7/10/2010). The SWMP and all annual reports shall be available to the public.

b. The permittee shall annually provide the public an opportunity to participate in the review and implementation of the SWMP.

c. The permittee shall report on the activities undertaken to provide public participation opportunities including compliance with part 2.3.3.a. Public participation opportunities pursuant

to part 2.3.3.b may include, but are not limited to, websites; hotlines; clean-up teams; monitoring teams; or an advisory committee.

2.3.4. Illicit Discharge Detection and Elimination (IDDE) Program

Objective: The permittee shall 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.

a. Legal Authority - The IDDE program shall include 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; and implement appropriate enforcement procedures and actions. Adequate legal authority consists of a currently effective ordinance, by-law, or other regulatory mechanism. For permittees authorized by the MS4-2003 permit, the ordinance, by-law, or other regulatory mechanism was a requirement of the MS4-2003 permit and was required to be effective by May 1, 2008. For new permittees the ordinance, by-law, or other regulatory mechanism shall be in place within 3 years of the permit effective date.
b. During the development of the new components of the IDDE program required by this permit, permittees authorized by the MS4-2003 permit must continue to implement their existing IDDE program required by the MS4-2003 permit to detect and eliminate illicit discharges to their MS4.

2.3.4.1. Definitions and Prohibitions

The permittee shall prohibit illicit discharges and sanitary sewer overflows (SSOs) to its MS4 and require removal of such discharges consistent with parts 2.3.4.2 and 2.3.4.4 of this permit.

An SSO is a discharge of untreated sanitary wastewater from a municipal sanitary sewer.

An illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of stormwater, except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.

2.3.4.2. Elimination of Illicit Discharges

a. Upon detection of an illicit discharge, the permittee shall locate, identify and eliminate the illicit discharge as expeditiously as possible. Upon identification of the illicit source the MS4 notify all responsible parties for any such discharge and require immediate cessation of improper disposal practices in accordance with its legal authorities. Where elimination of an illicit discharge within 60 days of its identification as an illicit discharge is not possible, the permittee shall establish an expeditious schedule for its elimination and report the dates of identification and schedules for removal in the permittee's annual reports. The permittee shall immediately commence actions necessary for elimination. The permittee shall diligently pursue elimination of all illicit discharges. In the interim, the permittee shall take all reasonable and prudent measures to minimize the discharge of pollutants to and from its MS4.

b. The period between identification and elimination of an illicit discharge is not a grace period. Discharges from an MS4 that are mixed with an illicit discharge are not authorized by this Permit (part 1.3.a) and remain unlawful until eliminated.

2.3.4.3. Non-Stormwater Discharges

The permittee may presume that the sources of non-stormwater listed in part 1.4 of this permit need not be addressed. However, if the permittee identifies any of these sources as significant contributors of pollutants to the MS4, then the permittee shall implement measures to control these sources so they are no longer significant contributors of pollutants, and/or eliminate them entirely, consistent with part 2.3.4.

2.3.4.4. Sanitary Sewer Overflows

a. Upon detection of an SSO the permittee shall eliminate it as expeditiously as possible and take interim mitigation measures to minimize the discharge of pollutants to and from its MS4 until elimination is completed.

b. The permittee shall identify all known locations where SSOs have discharged to the MS4 within the previous five (5) years. This shall include SSOs resulting, during dry or wet weather, from inadequate conveyance capacities, or where interconnectivity of the storm and sanitary sewer infrastructure allows for communication of flow between the systems. Within one (1) year of the effective date of the permit, the permittee shall develop an inventory of all identified SSOs indicating the following information, if available:

1. Location (approximate street crossing/address and receiving water, if any);
2. A clear statement of whether the discharge entered a surface water directly or entered the MS4;
3. Date(s) and time(s) of each known SSO occurrence (i.e., beginning and end of any known discharge);
4. Estimated volume(s) of the occurrence;
5. Description of the occurrence indicating known or suspected cause(s);
6. Mitigation and corrective measures completed with dates implemented; and
7. Mitigation and corrective measures planned with implementation schedules.

The permittee shall maintain the inventory as a part of the SWMP and update the inventory annually, all updates shall include the information in part 2.3.4.4.b.1-7.

c. In accordance with Paragraph B.12 of Appendix B of this permit, upon becoming aware of an SSO to the MS4, the permittee shall provide oral notice to EPA within 24 hours. Additionally, the permittee shall provide written notice to EPA and MassDEP within five (5) days of becoming aware of the SSO occurrence and shall include the information in the updated inventory. The notice shall contain all of the information listed in part 2.3.4.4.b. Where common notification requirements for SSOs are included in multiple NPDES permits issued to a permittee, a single notification may be made to EPA as directed in the permittee's wastewater or CSO NPDES permit and constitutes compliance with this part.

d. The permittee shall include and update the SSO inventory in its annual report, including the status of mitigation and corrective measures implemented by the permittee to address each SSO identified pursuant to this part.

e. The period between detection and elimination of a discharge from the SSO to the MS4 is not a grace period. Discharges from an MS4 that are mixed with an SSO are not authorized by this Permit (part 1.3.a) and remain unlawful until eliminated.

2.3.4.5. System mapping

The permittee shall develop a revised and more detailed map than was required by the MS4-2003 permit. This revised map of the MS4 shall be completed in two phases as outlined below. The mapping shall include a depiction of the permittee's separate storm sewer system in the permit area. The mapping is intended to facilitate the identification of key infrastructure and factors influencing proper system operation, and the potential for illicit sanitary sewer discharges.

a. Phase I: The system map shall be updated within two (2) years of the permit effective date to include the following information:

- Outfalls and receiving waters (required by MS4-2003 permit)
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- Municipally-owned stormwater treatment structures (e.g., detention and retention basins, infiltration systems , bioretention areas, water quality swales, gross particle separators, oil/water separators, or other proprietary systems)
- Waterbodies identified by name and indication of all use impairments as identified on the most recent EPA approved Massachusetts Integrated List of waters report pursuant to Clean Water Act section 303(d) and 305(b)
- Initial catchment delineations. Any available system data and topographic information may be used to produce initial catchment delineations. For the purpose of this permit, a catchment is the area that drains to an individual outfall or interconnection.

b. Phase II: The system map shall be updated annually as the following information becomes available during implementation of catchment investigation procedures in part 2.3.4.8. This information must be included in the map for all outfalls within ten (10) years of the permit effective date:

- Outfall spatial location (latitude and longitude with a minimum accuracy of +/-30 feet)
- Pipes
- Manholes
- Catch basins
- Refined catchment delineations. Catchment delineations shall be updated to reflect information collected during catchment investigations
- Municipal sanitary sewer system (if available)
- Municipal combined sewer system (if applicable).

c. Recommended elements to be included in the system map as information becomes available:

- Storm sewer material, size (pipe diameter) and age
- Sanitary sewer system material, size (pipe diameter) and 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
- Area where the permittee's MS4 has received or could receive flow from septic system discharges (e.g., areas with poor soils, or high ground water elevations unsuitable for conventional subsurface disposal systems)
- Seasonal high water table elevations impacting sanitary alignments
- Topography
- Orthophotography

- Alignments, dates and representation of work completed (with legend) of past illicit discharge investigations (e.g., flow isolation, dye testing, CCTV)
- Locations of suspected, confirmed and corrected illicit discharges (with dates and flow estimates).

d. The mapping may be produced by hand or through computer-aided methods (e.g. GIS). The required scale and detail of the map shall be appropriate to facilitate a rapid understanding of the system by the permittee, EPA and the state. In addition, the mapping shall serve as a planning tool for the implementation and phasing of the IDDE program and demonstration of the extent of complete and planned investigations and corrections. The permittee shall update the mapping as necessary to reflect newly discovered information and required corrections or modifications.

e. The permittee shall report on the progress towards the completion of the system map in each annual report.

2.3.4.6. Written Illicit Discharge Detection and Elimination Program

The IDDE program shall be recorded in a written (hardcopy or electronic) document. The IDDE program shall include each of the elements described in parts 2.3.4.7 and part 2.3.4.8, unless the permittee provides a written explanation within the IDDE program as to why a particular element is not applicable to the permittee.

Notwithstanding the permittee's explanation, EPA may at any time determine that a particular element is in fact applicable to the permittee and require the permittee to add it to the IDDE program. The written (hardcopy or electronic) IDDE program shall be completed within one (1) year of the effective date of the permit and updated in accordance with the milestones of this part. The permittee shall implement the IDDE program in accordance with the goals and milestones contained in this part.

a. The written (hardcopy or electronic) IDDE program shall include a reference or citation of the authority the permittee will use to implement all aspects of the IDDE program.

b. Statement of IDDE Program Responsibilities - The permittee shall establish a written (hardcopy or electronic) statement that clearly identifies responsibilities with regard to eliminating illicit discharges. The statement shall identify the lead municipal agency(ies) or department(s) responsible for implementing the IDDE Program as well as any other agencies or departments that may have responsibilities for aspects of the program (e.g., board of health responsibilities for overseeing septic system construction; sanitary sewer system staff; inspectional services for enforcing plumbing codes; town counsel responsibilities in enforcement actions, etc.). Where multiple departments and agencies have responsibilities with respect to the IDDE program specific areas of responsibility shall be defined and processes for coordination and data sharing shall be established and documented.

c. Program Procedures – The permittee shall include in the written IDDE program all written procedures developed in accordance with the requirements and timelines in parts 2.3.4.7 and 2.3.4.8 below. At a minimum this shall include the written procedures for dry weather outfall screening and sampling and for catchment investigations.

2.3.4.7. Assessment and Priority Ranking of Outfalls/Interconnections

The permittee shall assess and priority rank the outfalls in terms of their potential to have illicit discharges and SSOs and the related public health significance. This ranking will determine the priority order for

screening of outfalls and interconnections pursuant to part 2.3.4.7.b, catchment investigations for evidence of illicit discharges and SSOs pursuant to part 2.3.4.8, and provides the basis for determining permit milestones of this part.

a. Outfall/Interconnection Inventory and Initial Ranking:
An initial outfall and interconnection inventory and priority ranking to assess illicit discharge potential based on existing information shall be completed within one (1) year from the effective date of the permit; an updated inventory and ranking will be provided in each annual report thereafter. The inventory shall be updated annually to include data collected in connection with the dry weather screening and other relevant inspections conducted by the permittee.

i. The outfall and interconnection inventory will identify each outfall and interconnection discharging from the MS4, record its location and condition, and provide a framework for tracking inspections, screenings and other activities under the permittee's IDDE program.

- An outfall means a point source as defined by 40 CFR § 122.2 as the point where the municipal separate storm sewer discharges to waters of the United States. An outfall does not include open conveyances connecting two municipal separate storm sewers or pipes, tunnels or other conveyances that connect segments of the same stream or other waters of the United States and that are used to convey waters of the United States. (40 CFR § 122.26(b)(9)). However, it is strongly recommended that a permittee inspect all accessible portions of the system as part of this process. Culverts longer than a simple road crossing shall be included in the inventory unless the permittee can confirm that they are free of any connections and simply convey waters of the United States.
- An interconnection means the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is conveyed to waters of the United States or to another storm sewer system and eventually to a water of the United States.

ii. The permittee shall classify each of the permittee's outfalls and interconnections into one of the following categories:

- Problem Outfalls: Outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall include any outfalls/interconnections where previous screening indicates likely sewer input.[4] Problem Outfalls need not be screened pursuant to part 2.3.4.7.b.
- 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 permittee as high priority based on the characteristics listed below or other available information;
- Low Priority Outfalls: Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.
- Excluded outfalls: Outfalls/interconnections with no potential for illicit discharges may be

[4] Likely sewer input indicators are any of the following:
- Olfactory or visual evidence of sewage,
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

excluded from the IDDE program. 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.

iii. The permittee shall priority rank outfalls into the categories above (except for excluded outfalls), based on the following characteristics of the defined initial catchment area where information is available:

- Past discharge complaints and reports.
- Poor receiving water quality- the following guidelines are recommended to identify waters as having a high illicit discharge potential: exceeding water quality standards for bacteria; 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 those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.
- Age of development and infrastructure – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a low illicit discharge potential.
- Sewer conversion – contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential.
- Historic combined sewer systems – contributing areas that were once serviced by a combined sewer system, but have been separated may have a high illicit discharge potential.
- 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 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.
- The permittee may also consider additional relevant characteristics, including location-specific characteristics; if so, the permittee shall include the additional characteristics in its written (hardcopy or electronic) IDDE program.

b. Dry Weather Outfall and Interconnection Screening and Sampling
All outfalls/interconnections (excluding Problem and excluded Outfalls) shall be inspected for the presence of dry weather flow within three (3) years of the permit effective date. The permittee shall screen all High and Low Priority Outfalls in accordance with their initial ranking developed at part 2.3.4.7.a.

i. Written procedure: The permittee shall develop an outfall and interconnection screening and sampling procedure to be included in the IDDE program within one (1) year of the permit effective date. This procedure shall include the following procedures for:

- sample collection,
- use of field kits,

- storage and conveyance of samples (including relevant hold times), and
- field data collection and storage.

An example screening and sampling protocol (*EPA New England Bacterial Source Tracking Protocol*) can be found on EPA's website.

ii. Weather conditions: Dry weather screening and sampling shall proceed only when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring.

iii. Screening requirements: For each outfall/interconnection:

1. The permittee shall record all of the following information and include it in the outfall/interconnection inventory and priority ranking:

    - unique identifier,
    - receiving water,
    - date of most recent inspection,
    - dimensions,
    - shape,
    - material (concrete, PVC),
    - spatial location (latitude and longitude with a minimum accuracy of +/-30 feet,
    - physical condition,
    - indicators of potential non-stormwater discharges (including presence or evidence of suspect flow and sensory observations such as odor, color, turbidity, floatables, or oil sheen).

2. If an outfall/interconnection is inaccessible or submerged, the permittee shall proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results.

3. If no flow is observed, but evidence of illicit flow exists, the permittee shall revisit the outfall during dry weather within one week of the initial observation, if practicable, to perform a second dry weather screening and sample any observed flow (proceed as in iv. below).

4. Where dry weather flow is found at an outfall/interconnection, at least one (1) sample shall be collected, and:

    a) Samples shall be analyzed at a minimum for:

        - ammonia,
        - chlorine,
        - conductivity,
        - salinity,
        - *E. coli* (freshwater receiving water) or enterococcus (saline or brackish receiving water),
        - surfactants (such as MBAS),
        - temperature, and

- pollutants of concern[5]

b) All analyses with the exception of indicator bacteria and pollutants of concern can be performed with field test kits or field instrumentation and are not subject to 40 CFR part 136 requirements. Sampling for bacteria and pollutants of concern shall be conducted using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136. Sampling for ammonia and surfactants must use sufficiently sensitive methods to detect those parameters at or below the threshold indicator concentrations of 0.5 mg/L for ammonia and 0.25 mg/L for surfactants. Sampling for residual chlorine must use a method with a detection limit of 0.02 mg/L or 20 ug/L.

iv. The permittee may rely on screening conducted under the MS4-2003 permit, pursuant to an EPA enforcement action, or by the state or EPA to the extent that it meets the requirements of part 2.3.4.7.b.iii.4. All data shall be reported in each annual report. Permittees that have conducted substantially equivalent monitoring to that required by part 2.3.4.7.b as part of an EPA enforcement action can request an exemption from the requirements of part 2.3.4.7.b by submitting a written request to EPA and retaining exemption approval from EPA as part of the SWMP. Until the permittee receives formal written approval of the exemption from part 2.3.4.7.b from EPA the permittee remains subject to all requirements of part 2.3.4.7.b.

v. The permittee shall submit all screening data used in compliance with this part in its Annual Report.

c. Follow-up ranking of outfalls and interconnections:

i. The permittee's outfall and interconnection ranking (2.3.4.7.a) shall be updated to reprioritize outfalls and interconnections based on information gathered during dry weather screening (part 2.3.4.7.b).

ii. Outfalls/interconnections where relevant information was found indicating sewer input to the MS4 or sampling results indicating sewer input[6] shall be considered highly likely to contain illicit discharges from sanitary sources, and such outfalls/interconnections shall be ranked at the top of the High Priority Outfalls category for investigation. At this time, permittees may choose to rank other outfalls and interconnections based on any new information from the dry weather screening.

iii. The ranking can be updated continuously as dry weather screening information becomes available, but shall be completed within three (3) years of the effective date of the permit.

2.3.4.8. Catchment Investigations

The permittee shall develop a systematic procedure to investigate each catchment associated with an

[5] Where the discharge is directly into a water quality limited water or a water subject to an approved TMDL as indicated in Appendix F; the sample shall be analyzed for the pollutant(s) of concern identified as the cause of the impairment as specified in Appendix G

[6] Likely sewer input indicators are any of the following:

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

outfall or interconnection within their MS4 system.

a. Timelines:

- A written catchment investigation procedure shall be developed within 18 months of the permit effective date in accordance with the requirements of part 2.3.4.8.b below.
- Investigations of catchments associated with Problem Outfalls shall begin no later than two (2) years from the permit effective date.
- Investigations of catchments associated with High and Low Priority Outfalls shall follow the ranking of outfalls updated in part 2.3.4.7.c.
- Investigations of catchments associated with Problem Outfalls shall be completed within seven (7) years of the permit effective date
- Investigations of catchments where any information gathered on the outfall/interconnection identifies sewer input[7] shall be completed within seven (7) years of the permit effective date.
- Investigations of catchments associated with all High- and Low-Priority Outfalls shall be completed within ten (10) years of the permit effective date.

*For the purposes of these milestones, an individual catchment investigation will be considered complete if all relevant procedures in part 2.3.4.8.c. and 2.3.4.8.d. below have been completed.

b. A written catchment investigation procedure shall be developed that:

i. **Identifies 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 data sources will be used in identifying system vulnerability factors within each catchment.

ii. **Includes a manhole inspection methodology** that shall describe a storm drain network investigation that involves systematically and progressively observing, sampling (as required below) and evaluating key junction manholes (see definition in Appendix A) in the MS4 to determine the approximate location of suspected illicit discharges or SSOs. The manhole inspection methodology may either start from the outfall and work up the system or start from the upper parts of the catchment and work down the system or be a combination of both practices. Either method must, at a minimum, include an investigation of each key junction manhole within the MS4, even where no evidence of an illicit discharge is observed at the outfall. The manhole inspection methodology must describe the method the permittee will use. The manhole inspection methodology shall include procedures for dry and wet weather investigations.

iii. **Establishes procedures to isolate and confirm sources of illicit discharges** where manhole investigations or other physical evidence or screening has identified that MS4 alignments are influenced by illicit discharges or SSOs. These shall include isolation of the drainage area for implementation of more detailed investigations, inspection of additional manholes along the alignment to refine the location of potential contaminant sources, and methods such as sandbagging key junction manhole inlets, targeted internal plumbing inspections, dye testing,

[7] Likely sewer input indicators are any of the following:
- Olfactory or visual evidence of sewage,
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

video inspections, or smoke testing to isolate and confirm the sources.

c. Requirements for each catchment investigation associated with an outfall/interconnection:

i. For each catchment being investigated, the permittee shall review relevant mapping and historic plans and records gathered in accordance with Part 2.3.4.8.b.i. This review shall be used to identify areas within the catchment with higher potential for illicit connections. The permittee shall identify and record the presence of any of the following specific **System Vulnerability Factors (SVFs)**:

- 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.

EPA recommends the permittee include the following in their consideration of System Vulnerability Factors:

- 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 permittee shall document the presence or absence of System Vulnerability Factors for each catchment, retain this documentation as part of its IDDE program, and report this information in Annual Reports. Catchments with a minimum of one (1) System Vulnerability Factor are subject to wet weather sampling requirements of part 2.3.4.8.c.ii.2.

ii. For each catchment, the permittee must inspect key junction manholes and gather catchment information on the locations of MS4 pipes, manholes, and the extent of the contributing catchment.

1. For all catchments
   a) Infrastructure information shall be incorporated into the permittee's mapping required at part 2.3.4.5; the permittee will refine their catchment delineation based on the field investigation where appropriate.

b) The SVF inventory for the catchment will be updated based on information obtained during the inspection, including common (twin invert) manholes, directly piped connections between storm drains and sanitary sewer infrastructure, common weir walls, sanitary sewer underdrain connections and other structural vulnerabilities where sanitary discharges could enter the storm drain system during wet weather.
    1) **Where a minimum of one (1) SVF is identified based on previous information or the investigation, a wet weather investigation must be conducted at the associated outfall (see below).**
c) During dry weather, key junction manholes[8] shall be opened and inspected systematically for visual and olfactory evidence of illicit connections (e.g., excrement, toilet paper, gray filamentous bacterial growth, or sanitary products present).
    1) If flow is observed, the permittee shall sample the flow at a minimum for ammonia, chlorine and surfactants and can use field kits for these analyses.
    2) Where sampling results or visual or olfactory evidence indicate potential illicit discharges or SSOs, the area draining to the junction manhole shall be flagged for further upstream investigation.
d) Key junction and subsequent manhole investigations will proceed until the location of suspected illicit discharges or SSOs can be isolated to a pipe segment between two manholes. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completion of key junction manhole sampling.

2. <u>For all catchments with a minimum of one (1) SVF identified</u>
    a) The permittee shall meet the requirements above for dry weather screening
    b) The permittee shall inspect and sample under wet weather conditions to the extent necessary to determine whether wet weather-induced high flows in sanitary sewers or high groundwater in areas served by septic systems result in discharges of sanitary flow to the MS4.
        1) The permittee shall conduct at least one wet weather screening and sampling at the outfall that includes the same parameters required during dry weather screening, part 2.3.4.7.b.iii.4.
        2) Wet weather sampling and screening shall proceed during or after a storm event of sufficient depth or intensity to produce a stormwater discharge. EPA strongly recommends sampling during the spring (March through June) when groundwater levels are relatively high.
        3) The permit does not require a minimum rainfall event prior to wet weather screening. However, permittees may incorporate provisions that assist in targeting such discharges, including avoiding sampling during the initial period of discharge ("first flush") and/or identifying minimum storm event intensities likely to trigger sanitary sewer interconnections.
    c) This sampling can be done upon completion of any dry weather investigation but must be completed before the catchment investigation is marked as complete.

iii. All data collected as part of the dry and wet weather catchment investigations shall be recorded and reported in each annual report.

[8] Where catchments do not contain junction manholes, the dry weather screening and sampling shall be considered as meeting the manhole inspection requirement. In these catchments, dry weather screenings that indicate potential presence of illicit discharges shall be further investigated pursuant to part 2.3.4.8.d. Investigations in these catchments may be considered complete where dry weather screening reveals no flow; no evidence of illicit discharges or SSOs is indicated through sampling results or visual or olfactory means; and no wet weather System Vulnerability Factors are identified.

d. Identification/Confirmation of illicit source
Where the source of an illicit discharge has been approximated between two manholes in the permittee's MS4, the permittee shall isolate and identify/confirm the source of the illicit discharge using more detailed methods identified in their written procedure (2.3.4.8.b.iii). For outfalls that contained evidence of an illicit discharge, catchment investigations will be considered complete upon confirmation of all illicit sources.

e. Illicit discharge removal
When the specific source of an illicit discharge is identified, the permittee shall exercise its authority as necessary to require its removal pursuant to part 2.3.4.2 or 2.3.4.3.

i. For each confirmed source the permittee shall include in the annual report the following information:

- 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; and
- estimate of the volume of flow removed.

ii. Within one year of removal of all identified illicit discharges within a catchment area, confirmatory outfall or interconnection screening shall be conducted. The confirmatory screening shall be conducted in dry weather unless System Vulnerability Factors have been identified, in which case both dry weather and wet weather confirmatory screening shall be conducted. If confirmatory screening indicates evidence of additional illicit discharges, the catchment shall be scheduled for additional investigation.

2.3.4.9. Indicators of IDDE Program Progress

The permittee shall define or describe indicators for tracking program success and evaluate and report on the overall effectiveness of the IDDE program in each annual report. At a minimum the permittee shall document in each annual report:

- the number of SSOs and illicit discharges identified and removed,
- the number and percent of total outfall catchments served by the MS4 evaluated using the catchment investigation procedure,
- all dry weather and wet weather screening and sampling results and
- the volume of sewage removed

2.3.4.10 Ongoing Screening

Upon completion of all catchment investigations pursuant to part 2.3.4.8.c and illicit discharge removal and confirmation (if necessary) pursuant to paragraph 2.3.4.8.e, each outfall or interconnection shall be reprioritized for screening in accordance with part 2.3.4.7.a and scheduled for ongoing screening once every five years. Ongoing screening shall consist of dry weather screening and sampling consistent with part 2.3.4.7.b; wet weather screening and sampling shall also be required at outfalls where wet weather screening was required due to SVFs and shall be conducted in accordance with part 2.3.4.8.c.ii. All sampling results shall be reported in the permittee's annual report.

2.3.4.11 Training

The permittee shall, at a minimum, annually provide training to employees involved in IDDE program about the program, including how to recognize illicit discharges and SSOs. The permittee shall report on the frequency and type of employee training in the annual report.

2.3.5. Construction Site Stormwater Runoff Control

Objective: The objective of an effective construction stormwater runoff control program is to minimize or eliminate erosion and maintain sediment on site so that it is not transported in stormwater and allowed to discharge to a water of the U.S through the permittee's MS4. The construction site stormwater runoff control program required by this permit is a separate and distinct program from EPA's stormwater construction permit program. (http://cfpub1.epa.gov/npdes/stormwater/cgp.cfm)

a. Permittees shall implement and enforce a program to reduce pollutants in any stormwater runoff discharged to the MS4 from all construction activities that result in a land disturbance of greater than or equal to one acre within the regulated area. The permittee's program shall include disturbances less than one acre if that disturbance is part of a larger common plan of development or sale that would disturb one or more acres. Permittees authorized under the MS4-2003 permit shall continue to implement and enforce their existing program and modify as necessary to meet the requirements of this part.

b. The permittee does not need to apply its construction program requirements to projects that receive a waiver from EPA under the provisions of 40 CFR § 122.26(b) (15) (i).

c. The permittee shall develop and implement a construction site runoff control program that includes the elements in Paragraphs i. through v. of this part:

i. An ordinance or regulatory mechanism that requires the use of sediment and erosion control practices at construction sites. In addition to addressing sediment and erosion control, the ordinance must include controls for other wastes on construction sites such as demolition debris, litter and sanitary wastes. Development of an ordinance or other regulatory mechanism was a requirement of the MS4-2003 permit (See part II.B.4 and part IV.B.4).The ordinance or other regulatory mechanism required by the MS4-2003 permit shall have been effective by May 1, 2008.

ii. Written (hardcopy or electronic) procedures for site inspections and enforcement of sediment and erosion control measures. If not already existing, these procedures shall be completed within one (1) year from the effective date of the permit. The procedures shall clearly define who is responsible for site inspections as well as who has authority to implement enforcement procedures. The program shall provide that the permittee may, to the extent authorized by law, impose sanctions to ensure compliance with the local program. These procedures and regulatory authorities shall be documented in the SWMP.

iii. Requirements for construction site operators performing land disturbance activities within the MS4 jurisdiction that result in stormwater discharges to the MS4 to implement a sediment and erosion control program that includes BMPs appropriate for the conditions at the construction site. The program may include references to BMP

design standards in state manuals, such as the Massachusetts Stormwater Handbook[9], or design standards developed by the MS4. EPA supports and encourages the use of design standards in local programs. Examples of appropriate sediment and erosion control measures for construction sites include local requirements to:

1. Minimize the amount of disturbed area and protect natural resources;
2. Stabilize sites when projects are complete or operations have temporarily ceased;
3. Protect slopes on the construction site;
4. Protect all storm drain inlets and armor all newly constructed outlets;
5. Use perimeter controls at the site;
6. Stabilize construction site entrances and exits to prevent off-site tracking;
7. Inspect stormwater controls at consistent intervals.

iv. Requirements for construction site operators within the MS4 jurisdiction to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes. These wastes may not be discharged to the MS4.

v. Written procedures for site plan review and inspection and enforcement. If not already existing, the procedures for site plan review and inspection and enforcement shall be completed within one (1) year from the effective date of the permit. The site plan review procedure shall include a pre-construction review by the permittee of the site design, the planned operations at the construction site, planned BMPs during the construction phase, and the planned BMPs to be used to manage runoff created after development. The review procedure shall incorporate procedures for the consideration of potential water quality impacts, and procedures for the receipt and consideration of information submitted by the public. The site plan review procedure shall also include evaluation of opportunities for use of low impact design and green infrastructure. When the opportunity exists, the permittee shall encourage project proponents to incorporate these practices into the site design. The procedures for site inspections conducted by the permittee shall include the requirement that inspections occur during construction of BMPs as well as after construction of BMPs to ensure they are working as described in the approved plans, clearly defined procedures for inspections including qualifications necessary to perform the inspections, the use of mandated inspection forms if appropriate, and procedure for tracking the number of site reviews, inspections, and enforcement actions. This tracking information shall be included as part of each annual report required by part 4.4.

2.3.6. Stormwater Management in New Development and Redevelopment (Post Construction Stormwater Management)

Objective: The objective of this control measure is to reduce the discharge of pollutants found in stormwater through the retention or treatment of stormwater after construction on new or redeveloped sites. For the purposes of this part (2.3.6.), the following definitions apply:

site is defined as the area extent of construction activities, including but not limited to the creation of new impervious cover and improvement of existing impervious cover (e.g. repaving not covered by 2.3.6.a.ii.4.d.)

[9] The handbook is available at: http://www.mass.gov/dep/water/laws/policies.htm#storm

new development is defined as any construction activities or land alteration resulting in total earth disturbances equal to or greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) on an area that has not previously been developed to include impervious cover.

redevelopment is defined as any construction, land alteration, or improvement of impervious surfaces resulting in total earth disturbances equal to or greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) that does not meet the definition of new development (see above).

a. Permittees shall develop, implement, and enforce a program to address post-construction stormwater runoff from all new development and redevelopment sites that disturb one or more acres and discharge into the permittees MS4 at a minimum. Permittees authorized under the MS4-2003 permit shall continue to implement and enforce their program and modify as necessary to meet the requirements of this part.

i. The permittee's new development/ redevelopment program shall include sites less than one acre if the site is part of a larger common plan of development or redevelopment which disturbs one or more acre.

ii. The permittee shall develop or modify, as appropriate, an ordinance or other regulatory mechanism within two (2) years of the effective date of the permit to contain provisions that are at least as stringent as the following:

1. Low Impact Development (LID) site planning and design strategies must be used to the maximum extent feasible.

2. The design of treatment and infiltration practices should follow the guidance in Volume 2 of the Massachusetts Stormwater Handbook, as amended, or other federally or State approved[10] BMP design guidance.

3. Stormwater management systems on new development sites shall be designed to:

a) Not allow new stormwater conveyances to discharge untreated stormwater in accordance with Massachusetts Stormwater Handbook Standard 1;
b) Control peak runoff rates in accordance with Massachusetts Stormwater Handbook Standard 2[11];
c) Recharge groundwater in accordance with Massachusetts Stormwater Handbook Standard 3[12];
d) Eliminate or reduce the discharge of pollutants from land uses with higher pollutant loads as defined in the Massachusetts Stormwater Handbook in accordance with Massachusetts Stormwater Handbook Standard 5;
e) Protect Zone II or Interim Wellhead Protection Areas of public water supplies in accordance with Massachusetts Stormwater Handbook Standard 6[13];

[10] State approved includes any state in the United States, including, but not limited to, approved guidance by the Commonwealth of Massachusetts
[11] Requirement necessary for Section 401 water quality certification by Massachusetts
[12] Requirement necessary for Section 401 water quality certification by Massachusetts
[13] Requirement necessary for Section 401 water quality certification by Massachusetts

f) Implement long term maintenance practices in accordance with Massachusetts Stormwater Handbook Standard 9; and

g) Require that all stormwater management systems be designed to:

1) Retain the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area on the site AND/OR

2) Remove 90% of the average annual load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site[14] AND 60% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site[14]. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance any federally or State approved[15] BMP design guidance or performance standards (e.g. State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance.

4. Redevelopment Requirements

a) Stormwater management systems on Redevelopment sites shall meet the following sections of part 2.3.6.a.ii.3 to the maximum extent feasible:

1) Part 2.3.6.a.ii.3(a) (Massachusetts Stormwater Standard 1);
2) Part 2.3.6.a.ii.3(b) (Massachusetts Stormwater Standard 2);
3) Part 2.3.6.a.ii.3(c) (Massachusetts Stormwater Standard 3); and
4) The pretreatment and structural best management practices requirements of 2.3.6.a.ii.3(d) and 2.3.6.a.ii.3(e) (Massachusetts Stormwater Standards 5 and 6).

b) Stormwater management systems on Redevelopment sites shall also improve existing conditions by requiring that stormwater management systems be designed to:

1) Retain the volume of runoff equivalent to, or greater than, 0.80 inch multiplied by the total post-construction impervious surface area on the site AND/OR

2) Remove 80% of the average annual post-construction load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site AND 50% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool or other BMP performance evaluation tool provided by EPA Region 1 where available. If EPA Region 1 tools do not address the planned or installed BMP performance any federally or State approved BMP design guidance or performance standards (e.g. State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance.

c) Stormwater management systems on redevelopment sites may utilize offsite mitigation within the same USGS HUC10 as the redevelopment site

[14] The required removal percentage is not required for each storm,it is the average removal over a year that is required
[15] See footnote 14

to meet the equivalent retention or pollutant removal requirements in part 2.3.6.a.ii.4(b).

d) Redevelopment activities that are exclusively limited to maintenance and improvement of existing roadways, (including widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving projects) shall improve existing conditions where feasible and are exempt from part 2.3.6.a.ii.4(a), part 2.3.6.a.ii.4(b) and part 2.3.6.a.ii.4(c). Roadway widening or improvements that increase the amount of impervious area on the redevelopment site by greater than or equal to a single lane width shall meet the requirements of part 2.3.6.a.ii.4(a) – (c)fully.

iii. The permittee shall require, at a minimum, the submission of as-built drawings no later than two (2) years after completion of construction projects. The as-built drawings must depict all on site controls, both structural and non-structural, designed to manage the stormwater associated with the completed site (post construction stormwater management). The new development/redevelopment program shall have procedures to ensure adequate long-term operation and maintenance of stormwater management practices that are put in place after the completion of a construction project. These procedures may include the use of dedicated funds or escrow accounts for development projects or the acceptance of ownership by the permittee of all privately owned BMPs. These procedures may also include the development of maintenance contracts between the owner of the BMP and the permittee. Alternatively, these procedures may include the submission of an annual certification documenting the work that has been done over the last 12 months to properly operate and maintain the stormwater control measures. The procedures to require submission of as-built drawings and ensure long term operation and maintenance shall be a part of the SWMP. The permittee shall report in the annual report on the measures that the permittee has utilized to meet this requirement.

b. Within four (4) years of the effective date of this permit, the permittee shall develop a report assessing current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover. This assessment shall be used to provide information to allow the permittee to determine if changes to design standards for streets and parking lots can be made to support low impact design options. If the assessment indicates that changes can be made, the assessment shall include recommendations and proposed schedules to incorporate policies and standards into relevant documents and procedures to minimize impervious cover attributable to parking areas and street designs. The permittee shall implement all recommendations, in accordance with the schedules, contained in the assessment. The local planning board and local transportation board should be involved in this assessment. This assessment shall be part of the SWMP. The permittee shall report in each annual report on the status of this assessment including any planned or completed changes to local regulations and guidelines.

c. Within four (4) years from the effective date of the permit, the permittee shall develop a report assessing existing local regulations to determine the feasibility of making, at a minimum, the following practices allowable when appropriate site conditions exist:

i. Green roofs;

ii. Infiltration practices such as rain gardens, curb extensions, planter gardens, porous and pervious pavements, and other designs to manage stormwater using landscaping and structured or augmented soils; and

iii. Water harvesting devices such as rain barrels and cisterns, and the use of stormwater for non-potable uses.

The assessment should indicate if the practices are allowed in the MS4 jurisdiction and under what circumstances are they allowed. If the practices are not allowed, the permittee shall determine what hinders the use of these practices, what changes in local regulations may be made to make them allowable, and provide a schedule for implementation of recommendations. The permittee shall implement all recommendations, in accordance with the schedules, contained in the assessment. The permittee shall report in each annual report on its findings and progress towards making the practices allowable.(Information available at: http://www.epa.gov/region1/npdes/stormwater/assets/pdf/AddressingBarrier2LID.pdf and http://www.mapc.org/resources/low-impact-dev-toolkit/local-codes-lid)

d. Four (4) years from the effective date of this permit, the permittee shall identify a minimum of 5 permittee-owned properties that could potentially be modified or retrofitted with BMPs designed to reduce the frequency, volume, and pollutant loads of stormwater discharges to and from its MS4 through the reduction of impervious area. Properties and infrastructure for consideration shall include those with the potential for reduction of on-site impervious area (IA) as well as those that could provide reduction of off-site IA. At a minimum, the permittee shall consider municipal properties with significant impervious cover (including parking lots, buildings, and maintenance yards) that could be modified or retrofitted. MS4 infrastructure to be considered includes existing street right-of-ways, outfalls and conventional stormwater conveyances and controls (including swales and detention practices) that could be readily modified or retrofitted to provide reduction in frequency, volume or pollutant loads of such discharges through reduction of impervious cover.

In determining the potential for modifying or retrofitting particular properties, the permittee shall consider factors such as access for maintenance purposes; subsurface geology; depth to water table; proximity to aquifers and subsurface infrastructure including sanitary sewers and septic systems; and opportunities for public use and education. In determining its priority ranking, the permittee shall consider factors such as schedules for planned capital improvements to storm and sanitary sewer infrastructure and paving projects; current storm sewer level of service; and control of discharges to water quality limited waters, first or second order streams, public swimming beaches, drinking water supply sources and shellfish growing areas.

Beginning with the fifth year annual report and in each subsequent annual report, the permittee shall identify additional permittee owned sites and infrastructure that could be retrofitted such that the permittee maintains a minimum of 5 sites in their inventory, until such a time as when the permittee has less than 5 sites remaining. In addition, the permittee shall report on all properties that have been modified or retrofitted with BMPs to mitigate IA that were inventoried in accordance with this part. The permittee may also include in its annual report non-MS4 owned property that has been modified or retrofitted with BMPs to mitigate IA.

2.3.7. Good House Keeping and Pollution Prevention for Permittee Owned Operations

Objective: The permittee shall implement an operations and maintenance program for permittee-owned operations that has a goal of preventing or reducing pollutant runoff and protecting water quality from all permittee-owned operations.

a. Operations and Maintenance Programs

i. Within two (2) years from the effective date of the permit, the permittee shall develop, if not already developed, written (hardcopy or electronic) operations and maintenance

procedures for the municipal activities listed below in part 2.3.7.a.ii. These written procedures shall be included as part of the SWMP.

ii. Within two (2) year of the effective date of this permit, the permittee shall develop an inventory of all permittee owned facilities within the categories listed below. The permittee shall review this inventory annually and update as necessary.

1. Parks and open space: Establish procedures to address the proper use, storage, and disposal of pesticides, herbicides, and fertilizers including minimizing the use of these products and using only in accordance manufacturer's instruction. Evaluate lawn maintenance and landscaping activities to ensure practices are protective of water quality. Protective practices include reduced mowing frequencies, proper disposal of lawn clippings, and use of alternative landscaping materials (e.g., drought resistant planting). Establish pet waste handling collection and disposal locations at all parks and open space where pets are permitted, including the placing of proper signage concerning the proper collection and disposal of pet waste. Establish procedures to address waterfowl congregation areas where appropriate to reduce waterfowl droppings from entering the MS4. Establish procedures for management of trash containers at parks and open space (scheduled cleanings; sufficient number). Establish procedures to address erosion or poor vegetative cover when the permittee becomes aware of it; especially if the erosion is within 50 feet of a surface water.

2. Buildings and facilities where pollutants are exposed to stormwater runoff: This includes schools (to the extent they are permittee-owned or operated), town offices, police, and fire stations, municipal pools and parking garages and other permittee-owned or operated buildings or facilities. Evaluate the use, storage, and disposal of petroleum products and other potential stormwater pollutants. Provide employee training as necessary so that those responsible for handling these products know proper procedures. Ensure that Spill Prevention Plans are in place, if applicable, and coordinate with the fire department as necessary. Develop management procedures for dumpsters and other waste management equipment. Sweep parking lots and keep areas surrounding the facilities clean to reduce runoff of pollutants.

3. Vehicles and Equipment: Establish procedures for the storage of permittee vehicles. Vehicles with fluid leaks shall be stored indoors or containment shall be provided until repaired. Evaluate fueling areas owned or operated by the permittee. If possible, place fueling areas under cover in order to minimize exposure. Establish procedures to ensure that vehicle wash waters are not discharged to the municipal storm sewer system or to surface waters. This permit does not authorize such discharges.

iii. Infrastructure Operations and Maintenance

1. The permittee shall establish within two (2) year of the effective date of the permit a written (hardcopy or electronic) program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4. If the permittee has an existing program to maintain its MS4 infrastructure

in a timely manner to reduce or eliminate the discharge of pollutants from the MS4, the permittee shall document the program in the SWMP.

2. The permittee shall optimize routine inspections, cleaning and maintenance of catch basins such that the following conditions are met:

   - Prioritize inspection and maintenance for catch basins located near construction activities (roadway construction, residential, commercial, or industrial development or redevelopment). Clean catch basins in such areas more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings.
   - Establish a schedule with a goal that the frequency of routine cleaning will ensure that no catch basin at anytime will be more than 50 percent full.
   - If a catch basin sump is more than 50 percent full during two consecutive routine inspections/cleaning events, the permittee shall document that finding, investigate the contributing drainage area for sources of excessive sediment loading, and to the extent practicable, abate contributing sources. The permittee shall describe any actions taken in its annual report.
   - For the purposes of this part, an excessive sediment or debris loading is a catch basin sump more than 50 percent full. A catch basin sump is more than 50 percent full if the contents within the sump exceed one half the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin.
   - The permittee shall document in the SWMP and in the first annual report its plan for optimizing catch basin cleaning, inspection plans, or its schedule for gathering information to develop the optimization plan. Documentation shall include metrics and other information used to reach the determination that the established plan for cleaning and maintenance is optimal for the MS4. The permittee shall keep a log of catch basins cleaned or inspected.
   - The permittee shall report in each annual report the total number of catch basins, number inspected, number cleaned, and the total volume or mass of material removed from all catch basins.

3. The permittee shall establish and implement procedures for sweeping and/or cleaning streets, and permittee-owned parking lots. All streets with the exception of rural uncurbed roads with no catch basins or high speed limited access highways shall be swept and/or cleaned a minimum of once per year in the spring (following winter activities such as sanding). The procedures shall also include more frequent sweeping of targeted areas determined by the permittee on the basis of pollutant load reduction potential, based on inspections, pollutant loads, catch basin cleaning or inspection results, land use, water quality limited or TMDL waters or other relevant factors as determined by the permittee. The permittee shall report in each annual report the number of miles cleaned or the volume or mass of material removed.

   For rural uncurbed roadways with no catch basins and limited access highways, the permittee shall either meet the minimum frequencies above, or develop and implement an inspection, documentation and targeted sweeping plan within two (2) years of the effective date of the permit, and submit such plan with its year one annual report.

4. The permittee shall ensure proper storage of catch basin cleanings and street sweepings prior to disposal or reuse such that they do not discharge to receiving waters. These materials should be managed in compliance with current MassDEP policies:

   - For catch basins cleanings: http://www.mass.gov/eea/agencies/massdep/recycle/regulations/management-of-catch-basin-cleanings.html
   - For street sweepings: http://www.mass.gov/eea/docs/dep/recycle/laws/stsweep.pdf.

5. The permittee shall establish and implement procedures for winter road maintenance including the use and storage of salt and sand; minimize the use of sodium chloride and other salts, and evaluate opportunities for use of alternative materials; and ensure that snow disposal activities do not result in disposal of snow into waters of the United States. For purposes of this MS4 Permit, salt shall mean any chloride-containing material used to treat paved surfaces for deicing, including sodium chloride, calcium chloride, magnesium chloride, and brine solutions.

6. The permittee shall establish and implement inspection and maintenance frequencies and procedures for all stormwater treatment structures such as water quality swales, retention/detention basins, infiltration structures, proprietary treatment devices or other similar structures. All permittee-owned stormwater treatment structures (excluding catch basins) shall be inspected annually at a minimum.

iv. The permittee shall report in the annual report on the status of the inventory required by this part and any subsequent updates; the status of the O&M programs for the permittee-owned facilities and activities in part 2.3.7.a.ii; and the maintenance activities associated with each.

v. The permittee shall keep a written (hardcopy or electronic) record of all required activities including but not limited to maintenance activities, inspections and training required by part 2.3.7.a. The permittee shall maintain, consistent with part 4.2.a, all records associated with maintenance and inspection activities required by part 2.3.7.a.

b. Stormwater Pollution Prevention Plan (SWPPP)

The permittee shall develop and fully implement a SWPPP for each of the following permittee-owned or operated facilities: maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater as determined by the permittee. If facilities are located at the same property, the permittee may develop one SWPPP for the entire property. The SWPPP is a separate and different document from the SWMP required in part 1.10. A SWPPP does not need to be developed for a facility if the permittee has either developed a SWPPP or received a no exposure certification for the discharge under the Multi-Sector General Permit or the discharge is authorized under another NPDES permit.

i. No later than two (2) years from the effective date of the permit, the permittee shall develop and implement a written (hardcopy or electronic) SWPPP for the facilities

described above. The SWPPP shall be signed in accordance with the signatory requirements of Appendix B – Subparagraph 11.

ii. The SWPPP shall contain the following elements:

1. Pollution Prevention Team
Identify the staff on the team, by name and title. If the position is unstaffed, the title of the position should be included and the SWPPP updated when the position is filled. The role of the team is to develop, implement, maintain, and revise, as necessary, the SWPPP for the facility.

2. Description of the facility and identification of potential pollutant sources
The SWPPP shall include a map of the facility and a description of the activities that occur at the facility. The map shall show the location of the stormwater outfalls, receiving waters, and any structural controls. Identify all activities that occur at the facility and the potential pollutants associated with each activity including the location of any floor drains. These may be included as part of the inventory required by part 2.3.7.a.

3. Identification of stormwater controls
The permittee shall select, design, install, and implement the control measures detailed in paragraph 4 below to prevent or reduce the discharge of pollutants from the permittee owned facility.

The selection, design, installation, and implementation of the control measures shall be in accordance with good engineering practices and manufacturer's specifications. The permittee shall also take all reasonable steps to control or address the quality of discharges from the site that may not originate at the facility.

If the discharge from the facility is to a water quality limited water and the facility has the potential to discharge the pollutant identified as causing the water quality limitation, the permittee shall identify the control measures that will be used to address this pollutant at the facility so that the discharge does not cause or contribute to a violation of a water quality standard.

4. The SWPPP shall include the following management practices:
   a) Minimize or Prevent Exposure: The permittee shall to the extent practicable either locate materials and activities inside, or protect them with storm-resistant coverings in order to prevent exposure to rain, snow, snowmelt and runoff (although significant enlargement of impervious surface area is not recommended). Materials do not need to be enclosed or covered if stormwater runoff from affected areas will not be discharged directly or indirectly to surface waters or to the MS4 or if discharges are authorized under another NPDES permit.

   b) Good Housekeeping: The permittee shall keep clean all exposed areas that are potential sources of pollutants, using such measures as sweeping at regular intervals. Ensure that trash containers are closed when not in use, keep storage areas well swept and free from leaking or damaged containers; and store leaking vehicles needing repair indoors.

c) Preventative Maintenance: The permittee shall regularly inspect, test, maintain, and repair all equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in stormwater to receiving waters. Inspections shall occur at a minimum once per quarter.

d) Spill Prevention and Response: The permittee shall minimize the potential for leaks, spills, and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur. At a minimum, the permittee shall have procedures that include:

- Preventive measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling.
- Response procedures that include notification of appropriate facility personnel, emergency agencies, and regulatory agencies, and procedures for stopping, containing, and cleaning up leaks, spills and other releases. Measures for cleaning up hazardous material spills or leaks shall be consistent with applicable Resource Conservation and Recovery Act (RCRA) regulations at 40 CFR section 264 and 40 CFR section 265. Employees who may cause, detect, or respond to a spill or leak shall be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals should be a member of the Pollution Prevention Team; and
- Contact information for individuals and agencies that shall be notified in the event of a leak, spill, or other release. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under 40 CFR section 110, 40 CFR section 117, or 40 CFR section 302, occurs during a 24-hour period, the permittee shall notify the National Response Center (NRC) at (800) 424-8802 in accordance with the requirements of 40 CFR section 110, 40 CFR section 117, and 40 CFR section 302 as soon as the permittee has knowledge of the discharge. State or local requirements may necessitate reporting spills or discharges to local emergency, public health or drinking water supply agencies, and owners of public drinking water supplies. Contact information shall be in locations that are readily accessible and available.

e) Erosion and Sediment Control: The permittee shall use structural and non-structural control measures at the facility to stabilize and contain runoff from exposed areas and to minimize or eliminate onsite erosion and sedimentation. Efforts to achieve this may include the use of flow velocity dissipation devices at discharge locations and within outfall channels where necessary to reduce erosion.

f) Management of Runoff: The permittee shall manage stormwater runoff from the facility to prevent or reduce the discharge of pollutants. This may include management practices which divert runoff from areas that are potential sources of pollutants, contain runoff in such areas, or reuse, infiltrate or treat stormwater to reduce the discharge of pollutants.

g) Salt Storage Piles or Piles Containing Salt: For storage piles of salt or piles containing salt used for deicing or other purposes (including maintenance of paved surfaces) for which the discharge during precipitation events discharges to the permittee's MS4, any other storm sewer system, or to a Water of the US, the permittee shall prevent exposure of the storage pile to precipitation by enclosing or covering the storage piles. Such piles shall be enclosed or covered within two (2) years of the permit effective date. The permittee shall implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. The permittee is encouraged to store piles in such a manner as not to impact surface water resources, ground water resources, recharge areas, and wells.

h) Employee Training: The permittee shall regularly train employees who work in areas where materials or activities are exposed to stormwater, or who are responsible for implementing activities identified in the SWPPP (e.g., inspectors, maintenance personnel), including all members of the Pollution Prevention Team. Training shall cover both the specific components and scope of the SWPPP and the control measures required under this part, including spill response, good housekeeping, material management practices, any best management practice operation and maintenance, etc. EPA recommends annual training.

The permittee shall document the following information for each training:

- The training date, title and training duration;
- List of municipal attendees;
- Subjects covered during training

i) Maintenance of Control Measures: The permittee shall maintain all control measures, required by this permit in effective operating condition. The permittee shall keep documentation onsite that describes procedures and a regular schedule for preventative maintenance of all control measures and discussions of back-up practices in place should a runoff event occur while a control measure is off-line. Nonstructural control measures shall also be diligently maintained (e.g., spill response supplies available, personnel trained).

iii. The permittee shall conduct the following inspections:

1. Site Inspections: Inspect all areas that are exposed to stormwater and all stormwater control measures. Inspections shall be conducted at least once each calendar quarter. More frequent inspections may be required if significant activities are exposed to stormwater. Inspections shall be performed when the

facility is in operation. At least one of the quarterly inspections shall occur during a period when a stormwater discharge is occurring.

The permittee shall document the following information for each facility inspection:

- The inspection date and time;
- The name of the inspector;
- Weather information and a description of any discharge occurring at the time of the inspection;
- Identification of any previously unidentified discharges from the site;
- Any control measures needing maintenance or repair;
- Any failed control measures that need replacement.
- Any SWPPP changes required as a result of the inspection.

If during the inspections, or any other time, the permittee identifies control measures that need repair or are not operating effectively, the permittee shall repair or replace them before the next anticipated storm event if possible, or as soon as practicable following that storm event. In the interim, the permittee shall have back-up measures in place.

The permittee shall report the findings from the Site Inspections in the annual report.

iv. The permittee must keep a written (hardcopy or electronic) record of all required activities including but not limited to maintenance, inspections, and training required by part 2.3.7.b.The permittee shall maintain all records associated with the development and implementation of the SWPPP required by this part consistent with the requirements of part 4.2.

3.0. Additional Requirements for Discharges to Surface Drinking Water Supplies and Their Tributaries

a. Permittees which discharge to public surface drinking water supply sources (Class A and Class B surface waters used for drinking water) or their tributaries should consider these waters a priority in the implementation of the SWMP.

b. Permittees should provide pretreatment and spill control measures to stormwater discharges to public drinking water supply sources or their tributaries to the extent feasible.

c. Direct discharges to Class A waters should be avoided to the extent feasible.

4.0. Program Evaluation, Record Keeping, and Reporting

4.1. Program Evaluation

a. The permittee shall annually self-evaluate its compliance with the terms and conditions of this permit and submit each self-evaluation in the Annual Report. The permittee shall also maintain the annual evaluation documentation as part of the SWMP.

b. The permittee shall evaluate the appropriateness of the selected BMPs in achieving the objectives of each control measure and the defined measurable goals. Where a BMP is found to be ineffective the permittee shall change BMPs in accordance with the provisions below. In addition, permittees may augment or change BMPs at any time following the provisions below:

- Changes adding (but not subtracting or replacing) components or controls may be made at any time.
- Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP may be made as long as the basis for the changes is documented in the SWMP by, at a minimum:

    - An analysis of why the BMP is ineffective or infeasible;
    - Expectations on the effectiveness of the replacement BMP; and
    - An analysis of why the replacement BMP is expected to achieve the defined goals of the BMP to be replaced.

The permittee shall indicate BMP modifications along with a brief explanation of the modification in each Annual Report.

c. EPA or MassDEP may require the permittee to add, modify, repair, replace or change BMPs or other measures described in the annual reports as needed:

- To address impacts to receiving water quality caused or contributed to by discharges from the MS4; or
- To satisfy conditions of this permit

Any changes requested by EPA or MassDEP will be in writing and will set forth the schedule for the permittee to develop the changes and will offer the permittee the opportunity to propose alternative program changes to meet the objective of the requested modification.

4.2. Record Keeping

a. The permittee shall keep all records required by this permit for a period of at least five years. EPA may extend this period at any time. Records include information used in the development of any written (hardcopy or electronic) program required by this permit, any monitoring results, copies of reports, records of screening, follow-up and elimination of illicit discharges; maintenance records; inspection records; and data used in the development of the notice of intent, SWMP, SWPPP, and annual reports. This list provides examples of records that should be maintained, but is not all inclusive.

b. Records other than those required to be included in the annual report, part 4.4, shall be submitted only when requested by the EPA or the MassDEP.

c. The permittee shall make the records relating to this permit, including the written (hardcopy or electronic) stormwater management program, available to the public. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests. The permittee is encouraged to satisfy this requirement by posting records online.

4.3. Outfall Monitoring Reporting

a. The permittee shall monitor and sample its outfalls at a minimum through sampling and testing at the frequency and locations required in connection with IDDE screening under part 2.3.4.7.b. and 2.3.4.8.c.ii.2. The monitoring program may also include additional outfall and interconnection monitoring as determined by the permittee in connection with assessment of SWMP effectiveness pursuant to part 4.1; evaluation of discharges to water quality limited waters pursuant to part 2.2; assessment of BMP effectiveness pursuant to part 2.2 or 2.3; or otherwise.

b. The permittee shall document all monitoring results each year in the annual report. The report shall include the date, outfall or interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results of all analyses. The annual report shall include all of this information and data for the current reporting period and for the entire permit period.

c. The permittee shall also include in the annual report results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period where that data is being used by the permittee to inform permit compliance or program effectiveness. If such monitoring or studies were conducted on behalf of the permittee, or if monitoring or studies conducted by other entities were reported to the permittee, a brief description of the type of information gathered or received shall be included in the annual report(s) covering the time period(s) the information was received.

4.4. Annual Reports

a. The permittee shall submit annual reports each year of the permit term. The reporting period will be a one year period commencing on the permit effective date, and subsequent anniversaries thereof, except that the first annual report under this permit shall also cover the period from May 1, [year of final permit effective date] to the permit effective date. The annual report is due ninety days from the close of each reporting period.

b. The annual reports shall contain the following information:

i. A self-assessment review of compliance with the permit terms and conditions.

ii. An assessment of the appropriateness of the selected BMPs.

iii. The status of any plans or activities required by part 2.1 and/ or part 2.2, including:

- Identification of all discharges determined to be causing or contributing to an exceedance of water quality standards and description of response including all items required by part 2.1.1;
- For discharges subject to TMDL related requirements, identification of specific BMPs used to address the pollutant identified as the cause of impairment and assessment of the BMPs effectiveness at controlling the pollutant (part 2.2.1. and Appendix F) and any deliverables required by Appendix F;
- For discharges to water quality limited waters a description of each BMP required by Appendix H and any deliverables required by Appendix H.

iv. An assessment of the progress towards achieving the measurable goals and objectives of each control measure in part 2.3 including:

- Evaluation of the public education program including a description of the targeted messages for each audience; method of distribution and dates of distribution; methods used to evaluate the program; and any changes to the program.
- Description of the activities used to promote public participation including documentation of compliance with state public notice regulations.
- Description of the activities related to implementation of the IDDE program including: status of the map; status and results of the illicit discharge potential ranking and assessment; identification of problem catchments; status of all protocols described in part 2.3.4.(program responsibilities and systematic procedure); number and identifier of catchments evaluated; number and identifier of outfalls screened; number of illicit discharges located; number of illicit discharges removed; gallons of flow removed; identification of tracking indicators and measures of progress based on those indicators; and employee training.
- Evaluation of the construction runoff management including number of project plans reviewed; number of inspections; and number of enforcement actions.
- Evaluation of stormwater management for new development and redevelopment including status of ordinance development (2.3.6.a.ii.), review and status of the street design assessment(2.3.6.b.), assessments to barriers to green infrastructure (2.3.6.c), and retrofit inventory status (2.3.6.d.)
- Status of the O&M Programs required by part 2.3.7.a.
- Status of SWPPP required by part 2.3.7.b. including inspection results.
- Any additional reporting requirements in part 3.0.

v. All outfall screening and monitoring data collected by or on behalf of the permittee during the reporting period and cumulative for the permit term, including but not limited to all data collected pursuant to part 2.3.4. The permittee shall also provide a description of any additional monitoring data received by the permittee during the reporting period.

vi. Description of activities for the next reporting cycle.

vii. Description of any changes in identified BMPs or measurable goals.

viii. Description of activities undertaken by any entity contracted for achieving any measurable goal or implementing any control measure.

c. Reports shall be submitted to EPA at the following address:

United State Environmental Protection Agency
Stormwater and Construction Permits Section (OEP06-1)
Five Post Office Square, Suite 100
Boston, MA 02109

Massachusetts Department of Environmental Protection
One Winter Street – 5th Floor
Boston, MA 02108
ATTN: Frederick Civian

Or submitted electronically to EPA at the following email address: stormwater.reports@epa.gov. After December 21, 2020 all Annual Reports must be submitted electronically.

5.0. Non-Traditional MS4s

Non-traditional MS4s are MS4s owned and operated by the Commonwealth of Massachusetts, counties or other public agencies within the Commonwealth of Massachusetts, and properties owned and operated by the United States (Federal Facilities) within the Commonwealth of Massachusetts. This part addresses all non-traditional MS4s except MS4s that are owned or operated by transportation agencies, which are addressed in part 6.0 below.

5.1. Requirements for Non-Traditional MS4s

All requirements and conditions of parts 1 – 4 above apply to all Non-traditional MS4s, except as specifically provided below:

5.1.1. Public education

For the purpose of this permit, the audiences for a Non-traditional MS4 include the employees, clients and customers (including students at education MS4s), visitors to the property, tenants, long term contractors and any other contractors working at the facility where the MS4 is located. The permittee may use some of the educational topics included in part 2.3.2.d. as appropriate, or may focus on topics specific to the MS4. The permittee shall document the educational topics for each target audience in the SWMP and annual reports.

5.1.2. Ordinances and regulatory mechanisms

Some Non-traditional MS4s may not have authority to enact an ordinance, by-law, or other regulatory mechanisms. MS4s without the authority to enact an ordinance shall ensure that written policies or procedures are in place to address the requirements of part 2.3.4.5., part 2.3.4.6 and part 2.3.6.a.

5.1.3. Assessment of Regulations

Non-traditional MS4s do not need to meet the requirements of part 2.3.6.c.

5.1.4. New Dischargers

New MS4 facilities are subject to additional water quality-based requirements if they fall within the definition of "new discharger" under 40 CFR § 122.2: "A new discharger is any building, structure, facility or installation (a) from which there is or may be a 'discharge of pollutants' (b) that did not commence the 'discharge of pollutants' at a particular 'site' prior to August 13, 1979; (c) which is not a 'new source'; and (d) which never received a finally effective NPDES permit for discharges at that 'site.' The term "site" is defined in § 122.2 to mean "the land or water area where any 'facility or activity' is physically located or conducted including adjacent land used in connection with the facility or activity."

Consistent with these definitions, a Non-traditional MS4 is a "new discharger" if it discharges stormwater from a new facility with an entirely new separate storm sewer system that is not

physically located on the same or adjacent land as an existing facility and associated system operated by the same MS4.

Any Non-traditional MS4 facility that is a "new discharger" and discharges to a waterbody listed in category 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) due to nutrients (Total Nitrogen or Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enteroccus or Fecal Coliform), chloride (Chloride) or oil and grease (Petroleum Hydrocarbons or Oil and Grease), or discharges to a waterbody with an approved TMDL for any of those pollutants, is not eligible for coverage under this permit and shall apply for an individual permit.

Any Non-traditional MS4 facility that is a "new discharger" and discharges to a waterbody that is in attainment is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for new discharges where appropriate[16]. Any authorization of new discharges by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements.

6.0 Requirements for MS4s Owned or Operated by Transportation Agencies

This part applies to all MS4s owned or operated by any state or federal transportation agency (except Massachusetts Department of Transportation –MassDOT- Highway Division, which is subject to a separate individual permit). All requirements and conditions of this permit apply with the following exceptions:

6.1 Public education

For the purpose of this permit, the audiences for a transportation agency education program include the general public (users of the roadways), employees, and any contractors working at the location. The permittee may use some of the educational topics included in part 2.3.2.d. as appropriate, or may focus on topics specific to the agency. The permittee shall document the educational topics for each target audience.

6.2 Ordinances and regulatory mechanisms

The transportation agency may not have authority to enact an ordinance, by-law or other regulatory mechanisms. The agency shall ensure that written agency policies or procedures are in place to address the requirements of part 2.3.4.5., part 2.3.4.6 and part 2.3.6.a.

6.3 Assessment of regulations

Non-traditional MS4s do not need to meet the requirements of part 2.3.6.c.

6.4 New Dischargers

New MS4 facilities are subject to additional water quality-based requirements if they fall within the definition of "new dischargers" under 40 CFR § 122.2: "A new discharger is any building, structure, facility or installation (a) from which there is or may be a 'discharge of pollutants' (b) that did not commence the 'discharge of pollutants' at a particular 'site' prior to August 13, 1979; (c) which is not a 'new source'; and (d) which never received a finally effective NPDES permit for discharges at that 'site.' The term "site" is defined

[16] Contact MassDEP for guidance on compliance with 314 CMR 4.04

in § 122.2 to mean "the land or water area where any 'facility or activity' is physically located or conducted including adjacent land used in connection with the facility or activity."

Consistent with these definitions, a new transportation MS4 is a “new discharger” if it discharges stormwater from a new facility with an entirely new separate storm sewer system that is not physically located on the same or adjacent land as an existing facility and associated system operated by the same MS4.

Any transportation MS4 facility that is a “new discharger” and discharges to a waterbody listed as impaired in category 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) due to nutrients (Total Nitrogen or Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enteroccus or Fecal Coliform), chloride (Chloride) or oil and grease (Petroleum Hydrocarbons or Oil and Grease), or discharges to a waterbody with an approved TMDL for any of those pollutants, is not eligible for coverage under this permit and shall apply for an individual permit.

Any transportation MS4 facility that is a “new discharger” and discharges to a waterbody that is in attainment is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for new discharges where appropriate[17]. Any authorization of new discharges by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements.

[17] Contact MassDEP for guidance on compliance with 314 CMR 4.04

Appendix A
Definitions, Abbreviations and Acronyms

Definitions

Best Management Practices (BMPs) - schedules of activities, practices (and prohibitions of practices), structures, vegetation, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Common Plan of Development - A "larger common plan of development or sale" is a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan. For example, if a developer buys a 20-acre lot and builds roads, installs pipes, and runs electricity with the intention of constructing homes or other structures sometime in the future, this would be considered a larger common plan of development or sale. If the land is parceled off or sold, and construction occurs on plots that are less than one acre by separate, independent builders, this activity still would be subject to stormwater permitting requirements if the smaller plots were included on the original site plan.

Control Measure - refers to any BMP or other method (including effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

Director - a Regional Administrator of the Environmental Protection Agency or an authorized representative.

Discharge - when used without qualification, means the "discharge of a pollutant."

Discharge of a pollutant - any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from surface runoff which is collected or channeled by man; or discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works.

Discharge-related activities - activities which cause, contribute to, or result in stormwater and allowable non-stormwater point source discharges, and measures such as the siting, construction and operation of BMPs to control, reduce, or prevent pollution in the discharges.

Disturbance - action to alter the existing vegetation and/or underlying soil of a site, such as clearing, grading, site preparation (e.g., excavating, cutting, and filling), soil compaction, and movement and stockpiling of top soils.

Existing Discharger – an operator applying for coverage under this permit for discharges covered previously under an NPDES general or individual permit.

Facility or Activity - any NPDES "point source" or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

Federal Facility – Any buildings, installations, structures, land, public works, equipment, aircraft, vessels, and other vehicles and property, owned by, or constructed or manufactured for the purpose of leasing to, the federal government.

Illicit Discharge - any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.

Impaired Water – A water is impaired if it does not meet one or more of its designated use(s). For purposes of this permit, "impaired" refers to categories 4 and 5 of the five-part categorization approach used for classifying the water quality standards attainment status for water segments under the TMDL program. Impaired waters compilations are also sometimes referred to as "303(d) lists." Category 5 waters are impaired because at least one designated use is not being supported or is threatened and a TMDL is needed. Category 4 waters indicate that at least one designated use is not being supported but a TMDL is not needed (4a indicates that a TMDL has been approved or established by EPA; 4b indicates other required control measures are expected in result in the attainment of water quality standards in a reasonable period of time; and 4c indicates that the non-attainment of the water quality standard is the result of pollution (e.g. habitat) and is not caused by a pollutant). See *USEPA's 2006 Integrated Report Guidance, July 29, 2005* for more detail on the five part categorization of waters [under EPA National TMDL Guidance http://www.epa.gov/owow/tmdl/policy.html]).

Impervious Surface- Any surface that prevents or significantly impedes the infiltration of water into the underlying soil. This can include but is not limited to: roads, driveways, parking areas and other areas created using non porous material; buildings, rooftops, structures, artificial turf and compacted gravel or soil.

Industrial Activity - the ten categories of industrial activities included in the definition of "stormwater discharges associated with industrial activity," as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi).

Industrial Stormwater - stormwater runoff associated with the definition of "stormwater discharges associated with industrial activity."

Interconnection – the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is eventually conveyed to a water of the United States. Interconnections shall be treated similarly to outfalls throughout the permit.

Junction Manhole - For the purposes of this permit, a junction manhole is a manhole or structure 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 junction manholes for these purposes.

Key Junction Manhole - For the purposes of this permit, key junction manholes are those junction manholes that can represent one or more junction manholes without compromising adequate implementation of the illicit discharge program. Adequate implementation of the illicit discharge program would not be compromised if the exclusion of a particular junction manhole as a key junction manhole would not affect the permittee's ability to determine the possible presence of an upstream illicit discharge. A permittee may exclude a junction manhole located upstream from another located in the immediate vicinity or that is serving a drainage alignment with no potential for illicit connections.

Municipal Separate Storm Sewer - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
(ii) Designed or used for collecting or conveying stormwater;
(iii) Which is not a combined sewer; and
(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Municipal Separate Storm Sewer System (MS4) - means all separate storm sewers that are defined as "large" or "medium" or "small" municipal storm sewer systems pursuant to paragraphs 40 CFR 122.26 (b)(4) and (b)(7), or designated under paragraph 40 126.26(a) (1)(v). For the purposes of this permit "MS4" may also refer to the permittee with jurisdiction over the sewer system.

New Development – any construction activities or land alteration resulting in total earth disturbances greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) on an area that has not previously been developed to include impervious cover. (see part 2.3.6. of the permit)

New Discharger – For the purposes of this permit, a new discharger is an entity that discharges stormwater from a new facility with an entirely new separate storm sewer system that is not physically located on the same or adjacent land as an existing facility and associated system operated by the same MS4.

New Source - any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:

- after promulgation of standards of performance under section 306 of the CWA which are applicable to such source, or
- after proposal of standards of performance in accordance with section 306 of the CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal.

New Source Performance Standards (NSPS) – Technology-based standards for facilities that qualify as new sources under 40 CFR 122.2 and 40 CFR 122.29.

No exposure - all industrial materials or activities are protected by a storm-resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff.

One Lane Width – The width of the travel lane for a roadway. Lane width does not include shoulders, curbs, and on-street parking areas.

Outfall Catchment – The land area draining to a single outfall or interconnection. The extent of an outfall's catchment is determined not only by localized topography and impervious cover but also by the location of drainage structures and the connectivity of MS4 pipes.

Owner or operator - the owner or operator of any "facility or activity" subject to regulation under the NPDES program.

Person - an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Point source - any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Pollutant - dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water.

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 an impairment in a State's 303(d) list.

Redevelopment – for the purposes of part 2.3.6., any construction, land alteration, or improvement of impervious surfaces resulting in total earth disturbances greater than 1

acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) that does not meet the definition of new development (see above).

Reportable Quantity Release – a release of a hazardous substance at or above the established legal threshold that requires emergency notification. Refer to 40 CFR Parts 110, 177, and 302 for complete definitions and reportable quantities for which notification is required.

Runoff coefficient - the fraction of total rainfall that will appear at the conveyance as runoff.

Significant materials - includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharges.

Site – for the purposes of part 2.3.6., the area extent of construction activities, including but not limited to the creation of new impervious cover and improvement of existing impervious cover (e.g. repaving not covered by 2.3.6.a.ii.4.d.)

Small Municipal Separate Storm Sewer System – all separate storm sewer systems that are (i) owned or operated by the United States, a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district, or drainage district, or similar entity or an Indian tribe or an authorized Indian tribal organization or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States, and (ii) not defined as “large” or “medium” municipal separate storm sewer system pursuant to paragraphs 40 CFR 122.26 (b)(4) and (b)(7), or designated under paragraph 40 126.26(a) (1)(v). This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. This term does not include separate storm sewers in very discrete areas, such as individual buildings.

Small MS4 – means a small municipal separate storm sewer system.

Stormwater - stormwater runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Discharges Associated with Construction Activity - a discharge of pollutants in stormwater runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavating), construction materials, or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial

stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located. (See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15).

Stormwater Discharges Associated with Industrial Activity - the discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under Part 122. For the categories of industries identified in this section, the term includes, but is not limited to, stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with stormwater drained from the above described areas. Industrial facilities include those that are federally, State, or municipally owned or operated that meet the description of the facilities listed in Appendix D of this permit. The term also includes those facilities designated under the provisions of 40 CFR 122.26(a)(1)(v).

Total Maximum Daily Loads (TMDLs) - A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL includes wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources and/or natural background, and must include a margin of safety (MOS) and account for seasonal variations. (See section 303(d) of the Clean Water Act and 40 CFR 130.2 and 130.7).

Urbanized Area – US Census designated area comprised of a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core. For the purposes of this permit, Urbanized Areas as defined by any Census since 2000 remain subject to stormwater regulation even if there is a change in the reach of the Urbanized Area because of a change in more recent Census data.

Water Quality Limited Water – for the purposes of this permit, a water quality limited water is any waterbody that does not meet applicable water quality standards, including but not limited to waters listed in categories 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b).

Water Quality Standards - A water quality standard defines the water quality 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. States and EPA adopt WQS to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act (See CWA sections 101(a)2 and 303(c)).

ABBREVIATIONS AND ACRONYMS

BMP – Best Management Practice
BPJ – Best Professional Judgment
CGP – Construction General Permit
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 *et seq*)
DCIA – Directly Connected Impervious Area
EPA – U. S. Environmental Protection Agency
ESA – Endangered Species Act
USFWS – U. S. Fish and Wildlife Service
IA – Impervious Area
IDDE – Illicit Discharge Detection and Elimination
LA – Load Allocations
MOS – Margin of Safety
MS4 – Municipal Separate Storm Sewer System
MSGP – Multi-Sector General Permit
NHPA – National Historic Preservation Act
NMFS – U. S. National Marine Fisheries Service
NOI – Notice of Intent
NPDES – National Pollutant Discharge Elimination System
NRHP – National Register of Historic Places
NSPS – New Source Performance Standard
NTU – Nephelometric Turbidity Unit
PCP – Phosphorus Control Plan (pertaining to Charles River Watershed phosphorus TMDL requirements only – Appendix F Part A.I)
LPCP – Lake Phosphorus Control Plan (pertaining to Lake or pond phosphorus TMDL requirements only – Appendix F Part A.II)
POTW – Publicly Owned Treatment Works
RCRA – Resource Conservation and Recovery Act
SHPO – State Historic Preservation Officer
SIC – Standard Industrial Classification
SPCC – Spill Prevention, Control, and Countermeasure
SWMP – Stormwater Management Program
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
TSS – Total Suspended Solids

USGS – United States Geological Survey
WLA – Wasteload Allocation
WQS – Water Quality Standard

Appendix B

Standard Permit Conditions

Standard Permit Conditions

Standard permit conditions in Appendix B are consistent with the general permit provisions required under 40 CFR 122.41.

B.1. Duty To Comply

You must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

A. You must comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

B. Penalties for Violations of Permit Conditions: The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (61 FR 252, December 31, 1996, pp. 69359-69366, as corrected in 62 FR 54, March 20, 1997, pp.13514-13517) as mandated by the Debt Collection Improvement Act of 1996 for inflation on a periodic basis. This rule allows EPA's penalties to keep pace with inflation. The Agency is required to review its penalties at least once every 4 years thereafter and to adjust them as necessary for inflation according to a specified formula. The civil and administrative penalties following were adjusted for inflation starting in 1996.

1. *Criminal Penalties.*

   a. *Negligent Violations*. The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than one year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation or by imprisonment of not more than two years, or both.

   b. *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both. In the case of a

second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

c. *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision be subject to a fine of not more than $1,000,000 and can fined up to $2,000,000 for second or subsequent convictions.

d. *False Statement.* The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

2. *Civil Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $32,500 per day for each violation).

3. *Administrative Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows:

3.1. *Class I Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $11,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $32,500).

3.2. *Class II Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $11,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $157,500).

B.2. Duty to Reapply

If you wish to continue an activity regulated by this permit after the expiration date of this permit, you must apply for and obtain a new permit.

B.3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for you in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

B.4. Duty to Mitigate

You must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

B.5. Proper Operation and Maintenance

You must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by you to achieve compliance with the conditions of this permit, including the requirements of your SWPPP. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by you only when the operation is necessary to achieve compliance with the conditions of this permit.

B.6. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. Your filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

B.7. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privileges.

B.8. Duty to Provide Information

You must furnish to EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), within a reasonable time, any information which EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. You must also furnish to EPA upon request, copies of records required to be kept by this permit.

B.9. Inspection and Entry

You must allow EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), upon presentation of credentials and other documents as may be required by law, to:

A. Enter upon your premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

B. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

D. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

B.10. Monitoring and Records

A. Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the monitored activity.

B. You must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of EPA at any time.

C. Records of monitoring information must include:

1. The date, exact place, and time of sampling or measurements;
2. The individual(s) who performed the sampling or measurements;
3. The date(s) analyses were performed

4. The individual(s) who performed the analyses;

5. The analytical techniques or methods used; and

6. The results of such analyses.

D. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.

E. The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

B.11. Signatory Requirements

A. All applications, including NOIs, must be signed as follows:

1. For a corporation: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

2. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

3. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

B. All reports, including SWPPPs, inspection reports, annual reports, monitoring reports, reports on training and other information required by this permit must be signed by a person described in Appendix B, Subsection 11.A above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described in Appendix B, Subsection 11.A;

2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

3. The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

C. Changes to Authorization. If an authorization under Appendix B, Subsection 11.B is no longer accurate because a different operator has responsibility for the overall operation of the industrial facility, a new NOI satisfying the requirements of Subsection 11.B must be submitted to EPA prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Any person signing documents required under the terms of this permit must include the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

E. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

B.12. Reporting Requirements

A. Planned changes. You must give notice to EPA as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR §122.42(a)(1).

B. Anticipated noncompliance. You must give advance notice to EPA of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. Transfers. This permit is not transferable to any person except after notice to EPA. EPA may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Clean Water Act. (See 40 CFR §122.61; in some cases, modification or revocation and reissuance is mandatory.)

D. Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit.

1. Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms (paper or electronic) provided or specified by EPA for reporting results of monitoring of sludge use or disposal practices.

2. If you monitor any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by EPA.

3. Calculations for all limitations which require averaging of measurements must use an arithmetic mean and non-detected results must be incorporated in calculations as the limit of quantitation for the analysis.

E. Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

F. Twenty-four hour reporting.

1. You must report any noncompliance which may endanger health or the environment. Any information must be provided orally within 24 hours

from the time you become aware of the circumstances. A written submission must also be provided within five days of the time you become aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

2. The following shall be included as information which must be reported within 24 hours under this paragraph.

   a. Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)

   b. Any upset which exceeds any effluent limitation in the permit

   c. Violation of a maximum daily discharge limitation for any of the pollutants listed by EPA in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)

3. EPA may waive the written report on a case-by-case basis for reports under Appendix B, Subsection 12.F.2 if the oral report has been received within 24 hours.

G. Other noncompliance. You must report all instances of noncompliance not reported under Appendix B, Subsections 12.D, 12.E, and 12.F, at the time monitoring reports are submitted. The reports must contain the information listed in Appendix B, Subsection 12.F.

H. Other information. Where you become aware that you failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Permitting Authority, you must promptly submit such facts or information.

B.13. Bypass

A. Definitions.

1. Bypass means the intentional diversion of waste streams from any portion of a treatment facility

2. Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

B. Bypass not exceeding limitations. You may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential

maintenance to assure efficient operation. These bypasses are not subject to the provisions of Appendix B, Subsections 13.C and 13.D.

C. Notice.

1. Anticipated bypass. If you know in advance of the need for a bypass, you must submit prior notice, if possible at least ten days before the date of the bypass.

2. Unanticipated bypass. You must submit notice of an unanticipated bypass as required in Appendix B, Subsection 12.F (24-hour notice).

D. Prohibition of bypass.

1. Bypass is prohibited, and EPA may take enforcement action against you for bypass, unless:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

c. You submitted notices as required under Appendix B, Subsection 13.C.

2. EPA may approve an anticipated bypass, after considering its adverse effects, if EPA determines that it will meet the three conditions listed above in Appendix B, Subsection 13.D.1.

B.14. Upset

A. Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

B. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Appendix B, Subsection 14.C are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

C. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and that you can identify the cause(s) of the upset;
2. The permitted facility was at the time being properly operated; and
3. You submitted notice of the upset as required in Appendix B, Subsection 12.F.2.b (24 hour notice).
4. You complied with any remedial measures required under Appendix B, Subsection 4.

D. Burden of proof. In any enforcement proceeding, you, as the one seeking to establish the occurrence of an upset, has the burden of proof.

APPENDIX C
ENDANGERED SPECIES GUIDANCE

A. Background

In order to meet its obligations under the Clean Water Act and the Endangered Species Act (ESA), and to promote the goals of those Acts, the Environmental Protection Agency (EPA) is seeking to ensure the activities regulated by this general permit do not adversely affect endangered and threatened species or critical habitat. Applicants applying for permit coverage must assess the impacts of their stormwater discharges and discharge-related activities on federally listed endangered and threatened species ("listed species") and designated critical habitat ("critical habitat") to ensure that those goals are met. Prior to obtaining general permit coverage, applicants must meet the ESA eligibility provisions of this permit by following the steps in this Appendix[1].

Applicants also have an independent ESA obligation to ensure that their activities do not result in any prohibited "take" of listed species[12]. The term "Take" is used in the ESA to include harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. "Harass" is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Many of the measures required in this general permit and in these instructions to protect species may also assist in ensuring that the applicant's activities do not result in a prohibited take of species in violation of section 9 of the ESA. If the applicant has plans or activities in an area where endangered and threatened species are located, they may wish to ensure that they are protected from potential take liability under ESA section 9 by obtaining an ESA section 10 permit or by requesting formal consultation under ESA section 7. Applicants that are unsure whether to pursue a section 10 permit or a section 7 consultation for takings protection should confer with the appropriate United States Fish and Wildlife Service (USFWS) office or the National Marine Fisheries Service (NMFS), (jointly the Services).

Currently, there are 20 species of concern for applicants applying for permit coverage, namely the Dwarf wedgemussel *(Alasmidonta heterodon)*, Northeastern bulrush (*Scirpus ancistrochaetus*), Sandplain gerardia *(Agalinis acuta)*, Piping Plover (*Charadrius melodus*), Roseate Tern (*Sterna dougallii*), Northern Red-bellied cooter (*Pseudemys rubriventis)*, Bog Turtle (*Glyptemys muhlenbergii*), Small whorled Pogonia (*Isotria medeoloides*), Puritan tiger beetle (*Cicindela puritana*), American burying beetle (*Nicrophorus americanus*), Northeastern beach tiger beetle (*Cicindela dorsalis*), Northern Long-eared Bat *(Myotis septentriolis)*Atlantic Sturgeon *(Acipenser oxyrinchus*), Shortnose Sturgeon *(Acipenser brevirostrum)*, North Atlantic Right Whale (*Eubalaena glacialis*) Humpback Whale *(Megaptera novaengliae)*, Fin Whale (*Balaenoptera physalus)*, Kemp's Ridley Sea Turtle *(Lepidochelys kempii)*, Loggerhead Sea Turtle *(Caretta caretta)*, Leatherback Sea Turtle *(Dermochelys coriacea)*, and the Green Turtle *(Chelonia*

[1] EPA strongly encourages applicants to begin this process at the earliest possible stage to ensure the notification requirements for general permit coverage are complete upon Notice of Intent (NOI) submission.
[2] Section 9 of the ESA prohibits any person from "taking" a listed species (e.g. harassing or harming it) unless: (1) the taking is authorized through an "incidental take statement" as part of completion of formal consultation according to ESA section 7; (2) where an incidental take permit is obtained under ESA section 10 (which requires the development of a habitat conversion plan; or (3) where otherwise authorized or exempted under the ESA. This prohibition applies to all entities including private individuals, businesses, and governments.

mydas). The Atlantic Sturgeon, Shortnose Sturgeon, North Atlantic Right Whale, Humpback Whale, Fin Whale, Loggerhead Sea Turtle, Kemp's Ridley Sea Turtle, Leatherback Sea Turtle and Green Turtle are listed under the jurisdiction of NMFS. The Dwarf wedgemussel, Northeastern bulrush, Sandplain gerardia, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Small whorled Pogonia, Roseate Tern, Puritan tiger beetle, Northeastern beach tiger beetle, Northern Long-eared Bat and American burying beetle are listed under the jurisdiction of the U.S. Fish and Wildlife Service.

Any applicant seeking coverage under this general permit, must consult with the Services where appropriate. When listed species are present, permit coverage is only available if EPA determines, or the applicant determines and EPA concurs, that the discharge or discharge related activities will have "no affect" on the listed species or critical habitat, or the applicant or EPA determines that the discharge or discharge related activities are "not likely to adversely affect" listed species or critical habitat and formal or informal consultation with the Services has been concluded and results in written concurrence by the Services that the discharge is "not likely to adversely affect" an endangered or threatened species or critical habitat.

EPA may designate the applicants as non-Federal representatives for the general permit for the purpose of carrying out formal or informal consultation with the Services (See 50 CFR §402.08 and §402.13). By terms of this permit, EPA has automatically designated operators as non-Federal representatives for the purpose of conducting formal or informal consultation with the U.S. Fish and Wildlife Service. EPA has not designated operators as non-Federal representatives for the purpose of conducting formal or informal consultation with the National Marine Fisheries Service. EPA has determined that discharges from MS4s are not likely to adversely affect listed species or critical habitat under the jurisdiction of the National Marine Fisheries Service. EPA has initiated informal consultation with the National Marine Fisheries Service on behalf of all permittees and no further action is required by permittees in order to fulfill ESA requirements of this permit related to species under the jurisdiction of NMFS

B. The U.S. Fish and Wildlife Service ESA Eligibility Process

Before submitting a notice of intent (NOI) for coverage by this permit, applicants must determine whether they meet the ESA eligibility criteria by following the steps in Section B of this Appendix. Applicants that cannot meet the eligibility criteria in Section B must apply for an individual permit.

The USFWS ESA eligibility requirements of this permit relating to the Dwarf wedgemussel, Northeastern bulrush, Sandplain gerardia, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Small whorled Pogonia, Roseate Tern, Puritan tiger beetle, Northeastern beach tiger beetle, Northern Long-eared Bat and American burying beetle may be satisfied by documenting that one of the following criteria has been met:

USFWS Criterion A: No endangered or threatened species or critical habitat are in proximity to the stormwater discharges or discharge related activities.

USFWS Criterion B: In the course of formal or informal consultation with the Fish and Wildlife Service, under section 7 of the ESA, the consultation resulted in either a no jeopardy opinion (formal consultation) or a written concurrence by USFWS on a finding that the stormwater discharges and

discharge related activities are "not likely to adversely affect" listed species or critical habitat (informal consultation).

USFWS Criterion C: Using the best scientific and commercial data available, the effect of the stormwater discharge and discharge related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by EPA, or by the applicant and affirmed by EPA, that the stormwater discharges and discharge related activities will have "no affect" on any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the USFWS.

1. The Steps to Determine if the USFWS ESA Eligibility Criteria Can Be Met

To determine eligibility, you must assess the potential effects of your known stormwater discharges and discharge related activities on listed species or critical habitat, PRIOR to completing and submitting a Notice of Intent (NOI). You must follow the steps outlined below and document the results of your eligibility determination.

Step 1 – Determine if you can meet USFWS Criterion A

USFWS Criterion A: You can certify eligibility, according to USFWS Criterion A, for coverage by this permit if, upon completing the Information, Planning, and Conservation (IPaC) online system process, you printed and saved the preliminary determination which indicated that federally listed species or designated critical habitats are not present in the action area. See Attachment 1 to Appendix C for instructions on how to use IPaC.

If you have met USFWS Criterion A skip to Step # 4.

If you have not met USFWS Criterion A, go to Step # 2.

Step 2 – Determine if You Can Meet Eligibility USFWS Criteria B

USFWS Criterion B: You can certify eligibility according to USFWS Criteria B for coverage by this permit if you answer "Yes" to **all** of the following questions:

1) Does your action area contain one or more of the following species: Sandplain gerardia, Small whorled Pogonia, American burying beetle, Dwarf wedgemussel, Northeastern bulrush, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Roseate Tern, Puritan tiger beetle, and Northeastern beach tiger beetle?
   AND
2) Did your assessment of the discharge and discharge related activities indicate that the discharge or discharge related activities "may affect" or are "not likely to adversely affect" listed species or critical habitat?
   AND
3) Did you contact the USFWS and did the formal or informal consultation result in either a "no jeopardy" opinion by the USFWS (for formal consultation) or concurrence by the

USFWS that your activities would be "not likely to adversely affect" listed species or critical habitat (for informal consultation)?
AND

4) Do you agree to implement all measures upon which the consultation was conditioned?
5) Do you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the NOI that you will re-initiate informal or formal consultation with USFWS as necessary?

Use the guidance below Step 3 to understand effects determination and to answer these questions.

If you answered "Yes" to all four questions above, you have met eligibility USFWS Criteria B. Skip to Step 4.

If you answered "No" to any of the four questions above, go to Step 3.

Step 3 – Determine if You Can Meet Eligibility USFWS Criterion C

USFWS Criterion C: You can certify eligibility according to USFWS Criterion C for coverage by this permit if you answer "Yes" to both of the following question:

1) Does your action area contain one or more of the following species: Northern Long-eared Bat, Sandplain gerardia, Small whorled Pogonia and/or American burying beetle and **does not** contain one any following species: Dwarf wedgemussel, Northeastern bulrush, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Roseate Tern, Puritan tiger beetle, and Northeastern beach tiger beetle?[3]
OR
2) Did the assessment of your discharge and discharge related activities and indicate that there would be "no affect" on listed species or critical habitat and EPA provided concurrence with your determination?
3) Do you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the NOI that you will to conduct an endangered species screening for the proposed site and contact the USFWS if you determine that the new activity "may affect" or is "not likely to adversely affect" listed species or critical habitat under the jurisdiction of the USFWS.

Use the guidance below to understand effects determination and to answer these questions.

If you answered "Yes" to both the question above, you have met eligibility USFWS Criterion C. Go to Step 4.

If you answered "No" to either of the questions above, you are not eligible for coverage by this permit. You must submit an application for an individual permit for your stormwater discharges. (See 40 CFR 122.21).

USFWS Effects Determination Guidance:

If you are unable to certify eligibility under USFWS Criterion A, you must assess whether your stormwater discharges and discharge-related activities "may affect", will have "no affect" or are "not likely to adversely affect" listed species or critical habitat. "Discharge-related activities" include: activities which cause, contribute to, or result in point source stormwater pollutant discharges; and measures to provide treatment for stormwater discharges including the siting, construction and operational procedures to control, reduce or prevent water pollution. Please be aware that no protection from incidental take liability is provided under this criterion.

The scope of effects to consider will vary with each system. If you are having difficulty in determining whether your system is likely to cause adverse effects to a listed species or critical habitat, you should contact the USFWS for assistance. In order to complete the determination of effects it may be necessary to follow the formal or informal consultation procedures in section 7 of the ESA.

Upon completion of your assessment, document the results of your effects determination. If your results indicate that stormwater discharges or discharge related activities will have "no affect" on threatened or endangered species or critical habitat and EPA concurs with your determination, you are eligible under USFWS Criterion C of this Appendix. Your determination may be based on measures that you implement to avoid, eliminate, or minimized adverse effects.

If the determination is "May affect" or "not likely to adversely affect" you must contact the USFWS to discuss your findings and measures you could implement to avoid, eliminate, or minimize adverse effects. If you and the USFWS reach agreement on measures to avoid adverse effects, you are eligible under USFWS Criterion B. Any terms and/or conditions to protect listed species and critical habitat that you relied on in order to complete an adverse effects determination, must be incorporated into your Storm Water Management Program (required by this permit) and implemented in order to maintain permit eligibility.

If endangered species issues cannot be resolved: If you cannot reach agreement with the USFWS on measures to avoid or eliminate adverse effects then you are not eligible for coverage under this permit. You must seek coverage under an individual permit.

Effects from stormwater discharges and discharge-related activities which could pose an adverse effect include:

- *Hydrological:* Stormwater discharges may cause siltation, sedimentation, or induce other changes in receiving waters such as temperature, salinity or pH. These effects will vary with the amount of stormwater discharged and the volume and condition of the receiving water. Where a discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely.
- *Habitat:* Excavation, site development, grading and other surface disturbance activities, including the installation or placement of treatment equipment may adversely affect listed species or their habitat. Stormwater from the small MS4 may inundate a listed species habitat.

- *Toxicity:* In some cases, pollutants in the stormwater may have toxic effects on listed species.

Step 4 - Document Results of the Eligibility Determination

Once the USFWS ESA eligibility requirements have been met, you shall include documentation of USFWS ESA eligibility in the Storm Water Management Program required by the permit. Documentation for the various eligibility criteria are as follows:

- USFWS Criterion A: A copy of the IPaC generated preliminary determination letter indicating that no listed species or critical habitat is present within your action area. You shall also include a statement on how you determined that no listed species or critical habitat are in proximity to your stormwater system or discharges.
- USFWS Criterion B: A dated copy of the USFWS letter of concurrence on a finding of "no jeopardy" (for formal consultation) or "not likely to adversely affect" (for informal consultation) regarding the ESA section 7 consultation.
- USFWS Criterion C: A dated copy of the EPA concurrence with the operator's determination that the stormwater discharges and discharge-related activities will have "no affect" on listed species or critical habitat.

C. Submittal of Notice of Intent

Once the ESA eligibility requirements of Part C of this Appendix have been metyoumay submit the Notice of Intent indicating which Criterion you have met to be eligible for permit coverage. Signature and submittal of the NOI constitutes your certification, under penalty of law, of eligibility for permit coverage under 40 CFR 122.21.

D. Duty to Implement Terms and Conditions upon which Eligibility was Determined

You must comply with any terms and conditions imposed under the ESA eligibility requirements to ensure that your stormwater discharges and discharge related activities do not pose adverse effects or jeopardy to listed species and/or critical habitat. You must incorporate such terms and conditions into your Storm Water Management Program as required by this permit. If the ESA eligibility requirements of this permit cannot be met, then you may not receive coverage under this permit and must apply for an individual permit.

E. Services Information

United States Fish and Wildlife Service Office

National websites for Endangered Species Information:
Endangered Species home page: http://endangered.fws.gov
ESA Section 7 Consultations: http://endangered.fws.gov/consultation/index.html
Information, Planning, and Conservation System (IPAC): http://ecos.fws.gov/ipac/

U.S. FWS – Region 5
Supervisor

New England Field Office
U.S. Fish and Wildlife Services
70 Commercial Street, Suite 300
Concord, NH 03301

Natural Heritage Network

The Natural Heritage Network comprises 75 independent heritage program organizations located in all 50 states, 10 Canadian provinces, and 12 countries and territories located throughout Latin America and the Caribbean. These programs gather, manage, and distribute detailed information about the biological diversity found within their jurisdictions. Developers, businesses, and public agencies use natural heritage information to comply with environmental laws and to improve the environmental sensitivity of economic development projects. Local governments use the information to aid in land use planning.

The Natural Heritage Network is overseen by NatureServe, the Network's parent organization, and is accessible on-line at: http://www.natureserve.org/nhp/us_programs.htm, which provides websites and other access to a large number of specific biodiversity centers.

U.S. Fish and Wildlife IPaC system instructions

Use the following protocol to determine if any federally listed species or designated critical habitats under USFWS jurisdiction exist in your action area:

Enter your project specific information into the "Initial Project Scoping" feature of the Information, Planning, and Conservation (IPaC) system mapping tool, which can be found at the following location:

http://ecos.fws.gov/ipac/

a. Indicate the action area[1] for the MS4 by either:
    a. Drawing the boundary on the map or by uploading a shapefile.
    Select "Continue"

c. Click on the "SEE RESOURCE LIST" button and on the next screen you can export a trust resources list.This will provided a list of natural resources of concern, which will include an Endangered Species Act Species list. You may also request an official species list under "REGULATORY DOCUMENTS" Save copies and retain for your records

[1] The action area is defined by regulation as all areas to be affected directly or indirectly by the action and not merely the immediate area involved in the action (50 CFR §402.02). This analysis is not limited to the "footprint" of the action nor is it limited by the Federal agency's authority. Rather, it is a biological determination of the reach of the proposed action on listed species. Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based upon the action area.

The documentation used by a Federal action agency to initiate consultation should contain a description of the action area as defined in the Services' regulations and explained in the Services' consultation handbook. If the Services determine that the action area as defined by the action agency is incorrect, the Services should discuss their rationale with the agency or applicant, as appropriate. Reaching agreement on the description of the action area is desirable but ultimately the Services can only consult when an action area is defined properly under the regulations.

For storm water discharges or discharge related activities, the action area should encompass the following:

- The immediate vicinity of, or nearby, the point of discharge into receiving waters.
- The path or immediate area through which or over which storm water flows from the municipality to the point of discharge into the receiving water. This includes areas in the receiving water downstream from the point of discharge.
- Areas that may be impacted by construction or repair activities. This extends as far as effects related to noise (from construction equipment, power tools, etc.) and light (if work is performed at night) may reach.

The action area will vary with the size and location of the outfall pipe, the nature and quantity of the storm water discharges, and the type of receiving waters, among other factors.

Appendix D
National Historic Preservation Act Guidance

Background

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of Federal "undertakings" on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. The term federal "undertaking" is defined in the NHPA regulations to include a project, activity, or program of a federal agency including those carried out by or on behalf of a federal agency, those carried out with federal financial assistance, and those requiring a federal permit, license or approval. See 36 CFR 800.16(y). Historic properties are defined in the NHPA regulations to include prehistoric or historic districts, sites, buildings, structures, or objects that are included in, or are eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and remains that are related to and located within such properties. See 36 CFR 800.16(1).

EPA's issuance of a National Pollutant Discharge Elimination System (NPDES) General Permit is a federal undertaking within the meaning of the NHPA regulations and EPA has determined that the activities to be carried out under the general permit require review and consideration, in order to be in compliance with the federal historic preservation laws and regulations. Although individual submissions for authorization under the general permit do not constitute separate federal undertakings, the screening processes provides an appropriate site-specific means of addressing historic property issues in connection with EPA's issuance of the permit. To address any issues relating to historic properties in connection with the issuance of this permit, EPA has included a screening process for applicants to identify whether properties listed or eligible for listing on the National Register of Historic Places are within the path of their discharges or discharge-related activities (including treatment systems or any BMPs relating to the discharge or treatment process) covered by this permit.

Applicants seeking authorization under this general permit must comply with applicable, State, Tribal, and local laws concerning the protection of historic properties and places and may be required to coordinate with the State Historic Preservation Officer (SHPO) and/or Tribal Historic Preservation Officer (THPO) and others regarding effects of their discharges on historic properties.

Activities with No Potential to Have an Effect on Historic Properties

A determination that a federal undertaking has no potential to have an effect on historic properties fulfills an agency's obligations under NHPA. EPA has reason to believe that the vast majority of activities authorized under this general permit will have no potential effects on historic properties. This permit typically authorizes discharges from existing facilities and requires control of the pollutants discharged from the facility. EPA does not anticipate effects on historic properties from the pollutants in the authorized discharges. Thus, to the extent EPA's issuance of this general permit authorizes discharges of such constituents, confined to existing channels, outfalls or natural drainage areas, the permitting action does not have the potential to cause effects on historical properties.

In addition, the overwhelming majority of sources covered under this permit will be facilities that are seeking renewal of previous permit authorization. These existing dischargers should have already addressed NHPA issues in the previous general permit as they were required to certify that they were either not affecting historic properties or they had obtained written agreement from

the applicable SHPO or THPO regarding methods of mitigating potential impacts. To the extent this permit authorizes renewal of prior coverage without relevant changes in operations the discharge has no potential to have an effect on historic properties.

Activities with Potential to Have an Effect on Historic Properties

EPA believes this permit may have some potential to have an effect on historic properties the applicant undertakes the construction and/or installation of control measures that involve subsurface disturbance that involves less than 1 acre of land. (Ground disturbances of 1 acre or more require coverage under the Construction General Permit.) Where there is disturbance of land through the construction and/or installation of control measures, there is a possibility that artifacts, records, or remains associated with historic properties could be impacted. Therefore, if the applicant is establishing new or altering existing control measures to manage their discharge that will involve subsurface ground disturbance of less than 1 acre, they will need to ensure (1) that historic properties will not be impacted by their activities or (2) that they are in compliance with a written agreement with the SHPO, THPO, or other tribal representative that outlines all measures the applicant will carry out to mitigate or prevent any adverse effects on historic properties.

Examples of Control Measures Which Involve Subsurface Disturbance

The type of control measures that are presumptively expected to cause subsurface ground disturbance include:

- Dikes
- Berms
- Catch basins, drainage inlets
- Ponds, bioretention areas
- Ditches, trenches, channels, swales
- Culverts, pipes
- Land manipulation; contouring, sloping, and grading
- Perimeter Drains
- Installation of manufactured treatment devices

EPA cautions applicants that this list is non-inclusive. Other control measures that involve earth disturbing activities that are not on this list must also be examined for the potential to affect historic properties.

Certification

Upon completion of this screening process the applicant shall certify eligibility for this permit using one of the following criteria on their Notice of Intent for permit coverage:

> **Criterion A**: The discharges do not have the potential to cause effects on historic properties.

Criterion B: A historic survey was conducted. The survey concluded that no historic properties are present. Discharges do not have the potential to cause effects on historic properties.

Criterion C: The discharges and discharge related activities have the potential to have an effect on historic properties, and the applicant has obtained and is in compliance with a written agreement with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (TPHO), or other tribal representative that outlines measures the applicant will carry out to mitigate or prevent any adverse effects on historic properties.

Authorization under the general permit is available only if the applicant certifies and documents permit eligibility using one of the eligibility criteria listed above. Small MS4s that cannot meet any of the eligibility criteria in above must apply for an individual permit.

Screening Process

Applicants or their consultant need to answer the questions and follow the appropriate procedures below to assist EPA in compliance with 36 CFR 800.

Question 1*:* Is the facility an existing facility authorized by the previous permit or a new facility and the applicant is not undertaking any activity involving subsurface land disturbance less than an acre?

YES - The applicant should certify that fact in writing and file the statement with the EPA. This certification must be maintained as part of the records associated with the permit.
The applicant should certify eligibility for this permit using Criterion A on their Notice of Intent for permit coverage. The applicant does not need to contact the state Historic Commission. Based on that statement, EPA will document that the project has "no potential to cause effects" (36 CFR 800.3(a)(1)). There are no further obligations under the Section 106 regulations.

NO- Go to Question 2.

Question 2*:* Is the property listed in the National Register of Historic Places or have prior surveys or disturbances revealed the existence of a historic property or artifacts?

NO - The applicant should certify that fact in writing and file the statement with the EPA. This certification must be maintained as part of the records associated with the permit.
The applicant should certify eligibility for this permit using Criterion B on their Notice of Intent for permit coverage. The applicant does not need to contact the state Historic Commission. Based on that statement, EPA will document that the project has "no potential to cause effects" (36 CFR 800.3(a)(1)). There are no further obligations under the Section 106 regulations.

YES - The applicant or their consultant should prepare a complete information submittal to the SHPO. The submittal consists of:

- Completed Project Notification Form- forms available at http://www.sec.state.ma.us/mhc/mhcform/formidx.htm;

- USGS map section with the actual project boundaries clearly indicated; and
- Scaled project plans showing existing and proposed conditions.

(1) Please note that the SHPO does not accept email for review. Please mail a paper copy of your submittal (Certified Mail, Return Receipt Requested) or deliver a paper copy of your submittal (and obtain a receipt) to:

State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Blvd.
Boston MA 02125.

(2) Provide a copy of your submittal and the proof of MHC delivery showing the date MHC received your submittal to:

NPDES Permit Branch Chief
US EPA Region 1 (OEP06-1)
5 Post Office Square, Suite 100
Boston MA 02109-3912.

The SHPO will comment within thirty (30) days of receipt of complete submittals, and may ask for additional information. Consultation, as appropriate, will include EPA, the SHPO and other consulting parties (which includes the applicant). The steps in the federal regulations (36 CFR 800.2 to 800.6, etc.) will proceed as necessary to conclude the Section 106 review for the undertaking. **The applicant should certify eligibility for this permit using Criterion C on their Notice of Intent for permit coverage.**

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part I: General Conditions

General Information

Name of Municipality or Organization: State

EPA NPDES Permit Number:

Primary MS4 Program Manager Contact Information

Name: Title:

Street Address Line 1

Street Address Line 2

City State Zip Code 12345-6789

Email: Phone Number: (123) 456-7890

Fax Number:

Other Information

☐ Check the box if your municipality or organization was covered under the 2003 MS4 General Permit

Stormwater Management Program (SWMP) Location (web address or physical location):

Eligibility Determination

Endangered Species Act (ESA) Determination Complete? Eligibility Criteria (check all that apply): ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F

National Historic Preservation Act (NHPA) Determination Complete? Eligibility Criteria (check all that apply): ☐ A ☐ B ☐ C ☐ D

MS4 Infrastructure (if covered under the 2003 permit)

Estimated Percent of Outfall Map Complete? *(Part II,III,IV or V, Subpart B.3.(a.) of 2003 permit)* If 100% of 2003 requirements not met, enter an estimated date of completion (MM/DD/YY):

Web address where MS4 map is published:

If outfall map is unavailable on the internet an electronic or paper copy of the outfall map must be included with NOI submission (see section V for submission options)

Regulatory Authorities (if covered under the 2003 permit)

Illicit Discharge Detection and Elimination (IDDE) Authority Adopted?: *(Part II,III,IV or V, Subpart B.3.(b.) of 2003 permit)* Effective Date or Estimated Date of Adoption (MM/DD/YY):

Construction/Erosion and Sediment Control (ESC) Authority Adopted?: *(Part II,III,IV or V, Subpart B.4.(a.) of 2003 permit)* Effective Date or Estimated Date of Adoption (MM/DD/YY):

Post- Construction Stormwater Management Adopted?: *(Part II,III,IV or V, Subpart B.5.(a.) of 2003 permit)* Effective Date or Estimated Date of Adoption (MM/DD/YY):

Notice of Intent (NOI) for coverage under Small MS4 General Permit (continued)

Part II: Summary of Receiving Waters

Please list the waterbody segments to which your MS4 discharges. For each waterbody segment, please report the number of outfalls discharging into it and, if applicable, any impairments.

For Massachusetts list of impaired waters click here: Massachusetts 2010 List of Impaired: Waters http://www.mass.gov/dep/water/resources/10list6.pdf

For New Hampshire list of impaired waters click here: New Hampshire Final 303(d) Materials: http://des.nh.gov/organization/divisions/water/wmb/swqa/2010/index.htm

Source of pollutants column should be completed with a preliminary source evaluation of pollutants for discharges to impaired waterbodies (see above 303(d) lists) without an approved TMDL in accordance with Section 2.2.2a of the permit

Waterbody segment that receives flow from the MS4	Number of outfalls into receiving water segment	Pollutant list (select one at a time to add)	Click impairment at left to add, or at right to remove	Pollutant(s) causing impairment, if applicable (select one at a time to remove)
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	

		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total)	Add/Remove	

		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	
		Chlorophyll-a Dissolved oxygen saturation Escherichia coli Mercury Nitrogen (Total) Oxygen, Dissolved	Add/Remove	

Click to lengthen table

Notice of Intent (NOI) for coverage under Small MS4 General Permit (continued)

Part III: Stormwater Management Program Summary

Identify the Best Management Practices (BMPs) that will be employed to address each of the six Minimum Control Measures (MCMs). For municipalities/organizations whose MS4 discharges into a receiving water with an approved Total Maximum Daily Load (TMDL) and applicable waste lod allocation (WLA), identify any additional BMPs employed to specifically support the achievement of the WLA in the TMDL section at the end of Part III.

For each MCM list each existing or proposed BMP by category and provide a brief description, responsible parties/departments, measurable goals and the year the BMP will be employed (Public education and outreach BMPs also requires a target audience). **Use the drop-down menus in each table or enter your own text to override the drop down menu**

MCM 1: Public Education and Outreach

BMP Media/Category (enter your own text to override the drop down menu)	**BMP Description**	**Targeted Audience**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal**	**Beginning Year of BMP implementation**
		Residents			
		Businesses, Institutions and Commercial Facilities			
		Developers (construction)			
		Industrial Facilities			
		Residents			
		Businesses, Institutions and Commercial Facilities			
		Developers (construction)			
		Industrial Facilities			

Notice of Intent (NOI) for coverage under Small MS4 General Permit (continued)

Part III: Stormwater Management Program Summary

MCM 2: Public Involvement and Participation

BMP Categorization	Brief BMP Description (enter your own text to override the drop down menu)	Responsible Department/ Parties	Additional Description/ Measurable Goal	Beginning Year of BMP implementation
Public Review	SWMP Review			
Public Participation				

Notice of Intent (NOI) for coverage under Small MS4 General Permit (continued)

Part III: Stormwater Management Program Summary

MCM 3: Illicit Discharge Detection and Elimination (IDDE)

BMP Categorization (enter your own text to override the drop down menu)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)
SSO inventory			Develop SSO inventory within 1 year of effective date of permit
Storm sewer system map			Update map within 2 years of effective date of permit and complete full system map 10 years after effective date of permit
Written IDDE program development			Complete within 1.5 years of the effective date of permit
Implement IDDE Program			Implement catchment investigations according to program and permit conditions
Employee Training			Train annually
Conduct dry weather screening			Conduct in accordance with outfall screening procedure and permit conditions
Conduct wet weather screening			Conduct in accordance with outfall screening procedure and permit conditions

Notice of Intent (NOI) for coverage under Small MS4 General Permit (continued)

Part III: Stormwater Management Program Summary

MCM 4: Construction Site Stormwater Runoff Control

BMP Categorization (enter your own text to override the drop down menu or entered text)	**BMP Description**	**Responsible Department/ Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)	**Beginning Year of BMP implementation**
Site inspection and enforcement of Erosion and Sediment Control (ESC) measures	Complete written procedures of site inspections and enforcement procedures		Complete by the end of Year 1	
Site plan review	Complete written procedures of site plan review and begin implementation		Complete by the end of Year 1	
Erosion and Sediment Control	Adoption of requirements for construction operators to implement a sediment and erosion control program			
Waste Control	Adoption of requirements to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes.			

Notice of Intent (NOI) for coverage under Small MS4 General Permit (continued)

Part III: Stormwater Management Program Summary

MCM 5: Post-Construction Stormwater Management in New Development and Redevelopment

BMP Categorization (enter your own text to override the drop down menu or entered text)	**BMP Description**	**Responsible Department/ Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)	**Beginning Year of BMP implementation**
As-built plans for on-site stormwater control	The procedures to require submission of as-built drawings and ensure long term operation and maintenance will be a part of the SWMP.		Require submission of as-built plans for completed projects	
Inventory and priority ranking of MS4-owned properties that may be retrofitted with BMPs	Conduct detailed inventory of MS4 owned properties and rank for retrofit potential		Complete 4 years after permit effective date	
Allow green infrastructure	Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist		Complete 4 years after permit effective date	
Street design and parking lot guidelines	Develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support low impact design options.		Complete 4 years after permit effective date	
Ensure any stormwater controls or management practices for new development and redevelopment will prevent or minimize impacts to water quality.	Adoption, amendment or modification of a regulatory mechanism to meet permit requirements		Complete 2 years after permit effective date	

Notice of Intent (NOI) for coverage under Small MS4 General Permit (continued)

Part III: Stormwater Management Program Summary

MCM 6: Municipal Good Housekeeping and Pollution Prevention

BMP Categorization (enter your own text to override the drop down menu or entered text)	**BMP Description**	**Responsible Department/ Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)	**Beginning Year of BMP implementation**
Create written O&M procedures for parks and open spaces, buildings and facilities, and vehicles and equipment			Complete 2 years after permit effective date	
Inventory all permittee-owned parks and open spaces, buildings and facilities (including their storm drains), and vehicles and equipment			Complete 2 years after permit effective date	
Establish and implement program for repair and rehabilitation of MS4 infrastructure			Complete 2 years after permit effective date	
Stormwater Pollution Prevention Plan (SWPPP) for maintenance garages, transfer stations and other waste-handling facilities			Complete 2 years after permit effective date	
Catch Basin Cleaning				
Street Sweeping Program				
Road Salt use optimization program				

Notice of Intent (NOI) for coverage under Small MS4 General Permit (continued)

Part III: Stormwater Management Program Summary

Actions for meeting Total Maximum Daily Load (TMDL) Requirements

Use the drop-down menus to select the best categorization of your BMP and responsible party. If no options are applicable, or more than one, **enter your own text to override drop-down menus.**

Applicable TMDL	**Action Description**	**Responsible Department/ Parties** (enter your own text to override the drop down menu)

Use the drop-down menus to select the Pollutant causing the water quality limitation and enter the waterbody ID(s) experiencing excursions above water quality standards for that pollutant. Choose the action description from the dropdown menu and indicate the responsible party. If no options are applicable, or more than one, **enter your own text to override drop-down menus.**

Actions for meeting Requirements Related to water Quality Limited Waters

Part III: Stormwater Management Program Summary

Notice of Intent (NOI) for coverage under Small MS4 General Permit (continued)

Pollutant	**Waterbody ID(s)**	**Action Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)

Notice of Intent (NOI) for coverage under Small MS4 General Permit (continued)

Part IV: Notes and additional information

Use the space below to provide any additional information about your MS4 program

Click to add text

Notice of Intent (NOI) for coverage under Small MS4 General Permit (continued)

Part V: Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Title:

Signature Field Date:

NOI Submission

Please submit the form electronically via email using the "submit by Email" button below or send in a CD with your completed NOI. You may also print and submit via mail at the address below if you choose not to submit electronically. Outfall map required in Part I of the NOI (if applicable) can be submitted electronically as an email attachment OR as a paper copy.

Permittees that choose to submit their NOI electronically by email or by mailing a CD with the completed NOI form to EPA, will be able to download a partially filled Year 1 Annual Report at a later date from EPA.

Submit by Email — Submit by email using this button. Or, send an email with attachments to: stormwater.reports@epa.gov

Save — Save NOI for your records

EPA Submittal Address:

United States Environmental Protection Agency
5 Post Office Square - Suite 100
Mail Code - OEP06-1
Boston, Massachusetts 02109-3912
ATTN: Newton Tedder

State Submittal Address

Massachusetts Department of Environmental Protection
One Winter Street - 5th Floor
Boston, MA 02108
ATTN: Fred Civian

APPENDIX F

Requirements for Discharges to Impaired Waters with an Approved TMDL

Table of Contents

A. Requirements for Discharges to Impaired Waters with an Approved MassDEP In State TMDL

I. Charles River Watershed Phosphorus TMDL Requirements

On October 17, 2007, EPA approved the *Final TMDL for Nutrients in the Lower Charles River Basin* (Lower Charles TMDL)[1] and on June 10, 2011 EPA approved the *Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River* (Upper/Middle Charles TMDL)[2]. The following phosphorus reduction requirements address phosphorus in MS4 discharges.

1. To address the discharge of phosphorus from its MS4, the permittee shall develop a Phosphorus Control Plan (PCP) designed to reduce the amount of phosphorus in stormwater (SW) discharges from its MS4 to the Charles River and its tributaries. The PCP shall be completed in phases and the permittee shall add it as an attachment to its written SWMP upon completion and report in annual reports pursuant to part 4.4 of the Permit on its progress toward achieving its Phosphorus Reduction Requirement. The PCP shall be developed and fully implemented as soon as possible but no later than 20 years after the permit effective date in accordance with the phases and schedule outlined below. Each Phase shall contain the elements required of each phase as described in parts a.through c below. The timing of each phase over 20 years from the permit effective date is:

1-5 years after permit effective date	5-10 years after permit effective date	10-15 years after permit effective date	15-20 years after permit effective date
Create Phase 1 Plan	Implement Phase 1 Plan		
	Create Phase 2 Plan	Implement Phase 2 Plan	
		Create Phase 3 Plan	Implement Phase 3 Plan

a. Phase 1

1) The permittee shall complete a written Phase 1 plan of the PCP five years after the permit effective date and fully implement the Phase 1 plan of the PCP as soon as possible but no longer than 10 years after the permit effective date.
2) The Phase 1 plan of the PCP shall contain the following elements and has the following required milestones:

Item Number	Phase 1 of the PCP Component and Milestones	Completion Date
1-1	Legal analysis	2 years after permit effective date

[1] Massachusetts Department of Environmental Protection. 2007. *Final TMDL for Nutrients in the Lower Charles River Basin*. CN 301.1

[2] Massachusetts Department of Environmental Protection. 2011. *Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River Basin, Massachusetts*. CN 272.0

1-2	Funding source assessment.	3 years after permit effective date
1-3	Define scope of PCP (PCP Area) Baseline Phosphorus Load and Phosphorus Reduction Requirement and Allowable Phosphorus Load	4 years after permit effective date
1-4	Description of Phase 1 planned nonstructural controls	5 years after permit effective date
1-5	Description of Phase 1 planned structural controls	5 years after permit effective date
1-6	Description of Operation and Maintenance program for structural controls	5 years after permit effective date
1-7	Phase 1 implementation schedule	5 years after permit effective date
1-8	Estimated cost for implementing Phase 1 of the PCP	5 years after permit effective date
1-9	Complete Written Phase 1 PCP	5 years after permit effective date
1-10	Full implementation of nonstructural controls	6 years after permit effective date
1-11	Performance Evaluation	6, and 7 years after permit effective date
1-12	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.80 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.80)$	8 years after permit effective date
1-13	Performance Evaluation	9 years after permit effective date
1-14	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.75	10 years after permit effective date

	$P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.75)$	

Table F-1:Phase 1 of the PCP components and Milestones

3) Description of Phase 1 PCP Components

Legal Analysis- The permittee shall develop and implement an analysis that identifies existing regulatory mechanisms available to the MS4 such as by-laws and ordinances, and describes any changes to regulatory mechanisms that may be necessary to effectively implement the entire PCP. This may include the creation or amendment of financial and regulatory authorities. The permittee shall adopt necessary regulatory changes by the end of the permit term.

Funding source assessment – The permittee shall describe known and anticipated funding mechanisms (e.g. general funding, enterprise funding, stormwater utilities) that will be used to fund PCP implementation. The permittee shall describe the steps it will take to implement its funding plan. This may include but is not limited to conceptual development, outreach to affected parties, and development of legal authorities.

Scope of the PCP, Baseline Phosphorus Load (P_{base}), Phosphorus Reduction Requirement (P_{RR}) and Allowable Phosphorus Load (P_{allow}) - The permittee shall indicate the area in which it plans to implement the PCP. The permittee must choose one of the following: (1) to implement its PCP in the entire area within its jurisdiction (for municipalities this would be the municipal boundary) within the Charles River Watershed; or (2) to implement its PCP only in the urbanized area portion of the permittee's jurisdiction within the Charles River Watershed. The implementation area selected by the permittee is known as the "PCP Area" for that permittee. Table F-2[3] and Table F-3[4] list the permittees subject to phosphorus reduction requirements along with the estimated Baseline Phosphorous Loads in mass/yr, the calculated Allowable Stormwater Phosphorus Load in mass/yr, the Stormwater Phosphorus Reduction Requirement in mass/yr and the respective percent reductions necessary. The two tables contain different reduction requirements for each permittee based on the PCP Area they choose (see above). If the permittee chooses to implement the PCP in its entire jurisdiction, the permittee may demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural and non-structural controls on discharges that occur outside the regulated area. If the permittee chooses to implement the PCP in its regulated area only, the permittee must demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural

[3] The estimated Baseline Phosphorus Load, Allowable Phosphorus Load, Phosphorus Reduction Requirement and percent reductions presented in Table F-2 apply to the entire watershed land area that drains to the Charles River and its tributaries within the permittee's jurisdiction.

[4] The estimated Baseline Phosphorus Load, Allowable Phosphorus Load, Phosphorus Reduction Requirement and percent reductions presented in Table F-3 apply only to the urbanized area portion of the permittee's jurisdiction that drains to the Charles River or its tributaries.

and non-structural controls on discharges that occur within the regulated area only.

The permittee shall select the Baseline Phosphorus Load, Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load that corresponds to the PCP Area selected. The selected Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load will be used to determine compliance with PCP milestones of this Phase and Phase 2 and Phase 3. If the permittee chooses to implement its PCP in all areas within its jurisdiction within the Charles River Watershed, then the permittee shall use Table F-2 to determine the Baseline Phosphorus Load, Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load for its PCP Area. If the permittee chooses to implement its PCP only within the regulated area within the Charles River Watershed, then the permittee shall use Table F-3 to determine the Baseline Phosphorus Load, Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load for its PCP Area.

The Permittee may submit more accurate land use data from 2005, which is the year chosen as the baseline land use for the purposes of permit compliance, for EPA to recalculate baseline phosphorus stormwater loads for use in future permit reissuances. Updated land use maps, land areas, characteristics, and MS4 area and catchment delineations shall be submitted to EPA along with the year 4 annual report in electronic GIS data layer form for consideration for future permit requirements[5]. Until such a time as future permit requirements reflect information submitted in the year 4 annual report, the permittee shall use the Baseline Phosphorus Load, Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load Table F-2 (if its PCP Area is the permittee's entire jurisdiction) or Table F-3 (if its PCP Area is the regulated area only) to calculate compliance with milestones for Phase 1, 2, and 3 of the PCP.

Description of Phase 1 planned non-structural controls – The permittee shall describe the non-structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-1. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation in units of mass/yr. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F.

Description of Phase 1 planned structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of structural phosphorus controls during Phase 1. The ranking shall be developed through the use of available

[5] This submission is optional and needs only be done if the permittee has more accurate land use information from 2005 than information provided by MassGIS (http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/lus2005.html, retrieved 10/1/2013) or the permittee has updated MS4 drainage area characteristics and the permittee would like to update the Baseline Phosphorus Load.

screening and monitoring results collected during the permit term either by the permittee or another entity and the mapping required pursuant to part 2.3.4.6 of the Permit. The permittee shall also include in this priority ranking a detailed assessment of site suitability for potential phosphorus control measures based on soil types and other factors. The permittee shall coordinate this activity with the requirements of part 2.3.6.8.b of the Permit. A description and the results of this priority ranking shall be included in Phase 1 of the PCP. The permittee shall describe the structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-1. The description of structural controls shall include the planned and existing measures, the areas where the measures will be implemented or are currently implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party may be included in a municipal PCP. Annual phosphorus reductions from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F.

Description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish an Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1 of the PCP. This includes BMPs implemented to date as well as BMPs to be implemented during Phase 1 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule for each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.

Phase 1 Implementation Schedule – A schedule for implementation of all planned Phase 1 BMPs, including, as appropriate: obtaining funding, training, purchasing, construction, inspections, monitoring, operation and maintenance activities, and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the Phase 1 Plan, and all non-structural BMPs shall be fully implemented within six years of the permit effective date. Structural BMPs shall be designed and constructed to ensure the permittee will comply with the 8 and 10 year phosphorus load milestones established in Table F-1. The Phase 1 plan shall be fully implemented as soon as possible, but no later than 10 years after the effective date of permit.

Estimated cost for implementing Phase 1 of the PCP – The permittee shall estimate the cost of implementing the Phase 1 non-structural and structural controls and associated Operation and Maintenance Program. This cost estimate can be used to assess the validity of the funding source assessment completed by year 3 after the permit effective date and to update funding sources as necessary to complete Phase 1.

Complete written Phase 1 Plan – The permittee must complete the written Phase 1 Plan of the PCP no later than 5 years after the permit effective date. The complete Phase 1 Plan shall include Phase 1 PCP item numbers 1-1 through 1-7 in Table F-1. The permittee shall make the Phase 1 Plan

available to the public for public comment during Phase 1 Plan development. EPA encourages the permittee to post the Phase I Plan online to facilitate public involvement.

Performance Evaluation –The permittee shall evaluate the effectiveness of the PCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs[6] and tracking increases resulting from development. Phosphorus reductions shall be calculated consistent with Attachment 2 to Appendix F (non-structural BMP performance) and Attachment 3 to Appendix F (structural BMP performance) for all BMPs implemented to date. Phosphorus export increases since 2005 due to development shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus loading increases and reductions in unit of mass/yr shall be added or subtracted from the applicable Baseline Phosphorus Load given in Table F-2 or Table F-3 depending on the Scope of PCP chosen to estimate the yearly phosphorous export rate from the PCP Area. The permittee shall also include all information required in part I.2 of this Appendix in each performance evaluation. Performance evaluations will be included as part of each permittee's annual report as required by part 4.4 of the Permit.

Community Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed

Community	Baseline Phosphorus Load, kg/yr	Stormwater Phosphorus Load Reduction Requirement kg/yr	Allowable Phosphorus Load, kg/yr	Stormwater Percent Reduction in Phosphorus Load (%)
Arlington	106	57	49	53%
Ashland	67	23	44	34%
Bellingham	947	331	616	35%
Belmont	202	86	116	42%
Brookline	1,635	789	846	48 %
Cambridge	512	263	249	51%
Dedham	805	325	480	40%
Dover	831	137	694	17%
Foxborough	2	0	2	0%
Franklin	2,344	818	1,526	35%

[6] In meeting its phosphorus reduction requirements a permittee may quantify phosphorus reductions by actions undertaken by another entity, except where those actions are credited to MassDOT or another permittee identified in Appendix F Table F-2 or F-3.

Community Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed				
Community	**Baseline Phosphorus Load, kg/yr**	**Stormwater Phosphorus Load Reduction Requirement kg/yr**	**Allowable Phosphorus Load, kg/yr**	**Stormwater Percent Reduction in Phosphorus Load (%)**
Holliston	1,543	395	1,148	26%
Hopedale	107	37	70	35%
Hopkinton	292	66	226	22%
Lexington	530	194	336	37%
Lincoln	593	101	492	17%
Medfield	955	277	678	29%
Medway	1,063	314	749	30%
Mendon	29	9	20	31%
Milford	1,611	663	948	41%
Millis	969	248	721	26%
Natick	1,108	385	723	35%
Needham	1,772	796	976	45%
Newton	3,884	1,941	1,943	50%
Norfolk	1,004	232	772	23%
Somerville	646	331	315	51%
Sherborn	846	131	715	16%
Walpole	159	28	131	18%
Waltham	2,901	1,461	1,400	50%
Watertown	1,127	582	545	52%
Wayland	46	15	31	33%
Wellesley	1,431	661	770	46%
Weston	1,174	281	893	24%
Westwood	376	114	262	30%
Wrentham	618	171	447	28%
Mass-DCR	421	91	330	22%

Table F-2: Baseline Phosphorus Load, Phosphorus Reduction Requirement, Allowable Phosphorus Load and Percent Reduction in Phosphorus Load from Charles River Watershed. For use when PCP Area is chosen to be the entire community within the Charles River Watershed.

Urbanized Area Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed				
Community	**Baseline Watershed Phosphorus Load, kg/yr**	**Stormwater Phosphorus Load Reduction Requirement, kg/yr**	**Allowable Phosphorus Load, kg/yr**	**Stormwater Percent Reduction in Phosphorus Load (%)**
Arlington	106	57	49	53%
Ashland	67	23	44	34%
Bellingham	801	291	510	36%
Belmont	202	86	116	42%
Brookline	1,635	789	846	48 %
Cambridge	512	263	249	51%
Dedham	805	325	480	40%
Dover	282	54	228	19%
Foxborough	2	0	2	0%
Franklin	2,312	813	1,499	35%
Holliston	1,359	369	990	27%
Hopedale	107	37	70	35%
Hopkinton	280	65	215	23%
Lexington	525	193	332	37%
Lincoln	366	63	303	17%
Medfield	827	267	560	33%
Medway	1,037	305	732	29%
Mendon	10	5	5	50%
Milford	1,486	653	833	44%
Millis	501	159	342	32%
Natick	994	359	635	36%
Needham	1,771	795	976	45%
Newton	3,884	1,941	1,943	50%
Norfolk	1,001	231	770	23%
Somerville	646	331	315	51%
Sherborn	203	38	165	19%
Walpole	159	28	131	18%
Waltham	2,901	1,461	1,440	50%
Watertown	1,127	582	545	52%
Wayland	46	15	31	33%
Wellesley	1,431	661	770	46%

Urbanized Area Annual Stormwater Phosphorus Load Reduction by Permittee, Charles River Watershed				
Community	**Baseline Watershed Phosphorus Load, kg/yr**	**Stormwater Phosphorus Load Reduction Requirement, kg/yr**	**Allowable Phosphorus Load, kg/yr**	**Stormwater Percent Reduction in Phosphorus Load (%)**
Weston	1,174	281	893	24%
Westwood	346	108	238	31%
Wrentham	556	159	397	29%
Mass DCR	396	89	307	22%

Table F-3: Baseline Phosphorus Load, Phosphorus Reduction Requirement, Allowable Phosphorus Load and Percent Reduction in Phosphorus Load from Charles River Watershed. For use when PCP Area is chosen to be only the urbanized area portion of a permittee's jurisdiction within the Charles River Watershed.

b. Phase 2

1) The permittee shall complete the Phase 2 Plan of the PCP 10 years after the permit effective date and fully implement the Phase 2 plan of the PCP as soon as possible but no longer than 15 years after the permit effective date.
2) The Phase 2 plan of the PCP shall be added to the Phase 1 Plan and contain the following elements and has the following required milestones:

Item Number	Phase 2 of the PCP Component and Milestones	Completion Date
2-1	Update Legal analysis	As necessary
2-2	Description of Phase 2 planned nonstructural controls	10 years after permit effective date
2-3	Description of Phase 2 planned structural controls	10 years after permit effective date
2-4	Updated description of Operation and Maintenance Program	10 years after permit effective date
2-5	Phase 2 implementation schedule	10 years after permit effective date
2-6	Estimated cost for implementing Phase 2 of the PCP	10 years after permit effective date

2-7	Complete written Phase 2 Plan	10 years after permit effective date
2-8	Performance Evaluation.	11, and 12 years after permit effective date
2-9	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.65 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.65)$	13 years after permit effective date
2-10	Performance Evaluation	14 years after permit effective date
2-11	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.50 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.50)$	15 years after permit effective date

Table F-4: Phase 2 of the PCP components and Milestones

3) Description of Phase 2 PCP Components

Updated Legal Analysis- The permittee shall update the legal analysis completed during Phase 1 of the PCP as necessary to include any new or augmented bylaws, ordinances or funding mechanisms the permittee has deemed necessary to implement the PCP. The permittee shall use experience gained during Phase 1 to inform the updated legal analysis. The permittee shall adopt necessary regulatory changes as soon as possible to implement the Phase 2 Plan.

Description of Phase 2 planned non-structural controls – The permittee shall describe the non-structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-4. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation in units of mass/yr. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F.

Description of planned Phase 2 structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of phosphorus control practices during Phase 2. The ranking shall build upon the ranking developed for Phase 1. The permittee shall describe the structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-4. The description of structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party[7] may be included in a municipal PCP. Annual phosphorus reductions from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F.

Updated description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish an Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1 and 2 of the PCP. This includes BMPs implemented to date as well as BMPs to be implemented during Phase 2 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule for each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.

Phase 2 Implementation Schedule – A schedule for implementation of all planned Phase 2 BMPs, including, as appropriate: funding, training, purchasing, construction, inspections, monitoring, O&M activities and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the Phase 2 Plan. Structural BMPs shall be designed and constructed to ensure the permittee will comply with the 13 and 15 year milestones established in Table F-4. The Phase 2 plan shall be fully implemented as soon as possible, but no later than 15 years after the effective date of permit.

Estimated cost for implementing Phase 2 of the PCP – The permittee shall estimate the cost of implementing the Phase 2 non-structural and structural controls and associated Operation and Maintenance Program. This cost estimate can be used to plan for the full implementation of Phase 2.

Complete written Phase 2 Plan – The permittee must complete a written Phase 2 Plan of the PCP no later than 10 years after the permit effective date. The complete Phase 2 Plan shall include Phase 2 PCP item numbers 2-1 through 2-6 in Table F-4. The permittee shall make the Phase 2 Plan available to the public for public comment during Phase 2 plan development. EPA encourages the permittee to post the Phase 2 Plan online to facilitate public involvement.

[7] See footnote 6

Performance Evaluation – The permittee shall evaluate the effectiveness of the PCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs[8] and tracking increases resulting from development. Phosphorus reductions shall be calculated consistent with Attachment 2 to Appendix F (non-structural BMP performance) and Attachment 3 to Appendix F (structural BMP performance) for all BMPs implemented to date. Phosphorus export increases due to development shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus loading increases and reductions in unit of mass/yr shall be added or subtracted from the applicable Baseline Phosphorus Load given in Table F-2 or Table F-3 depending on the Scope of PCP chosen to estimate the yearly phosphorous export rate from the PCP Area. The permittee shall also include all information required in part I.2 of this Appendix in each performance evaluation. Performance evaluations will be included as part of each permittee's annual report as required by part 4.4 of the Permit.

c. Phase 3

1) The permittee shall complete the Phase 3 Plan of the PCP 15 years after the permit effective date and fully implement the Phase 3 plan of the PCP as soon as possible but no longer than 20 years after the permit effective date.
2) The Phase 3 plan of the PCP shall be added to the Phase 1 Plan and the Phase 2 Plan to create the comprehensive PCP and contain the following elements and has the following required milestones:

Item Number	Phase 3 of the PCP Component and Milestones	Completion Date
3-1	Update Legal analysis	As necessary
3-2	Description of Phase 3 planned nonstructural controls	15 years after permit effective date
3-3	Description of Phase 3 planned structural controls	15 years after permit effective date
3-4	Updated description of Operation and Maintenance (O&M) Program	15 years after permit effective date
3-5	Phase 3 implementation schedule	15 years after permit effective date
3-6	Estimated cost for implementing Phase 3 of the PCP	15 years after permit effective date
3-7	Complete written Phase 3 Plan	15 years after permit effective date

[8] See footnote 9

3-8	Performance Evaluation.	16, and 17 years after permit effective date
3-9	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.30 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.30)$	18 years after permit effective date
3-10	Performance Evaluation	19 years after permit effective date
3-11	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load (P_{allow}) $P_{exp} \leq P_{allow}$	20 years after permit effective date

Table F-5:Phase 3 of the PCP components and Milestones

3) Description of Phase 3 PCP Components

Updated Legal Analysis- The permittee shall update the legal analysis completed during Phase 1 and Phase 2 of the PCP as necessary to include any new or augmented bylaws, ordinances or funding mechanisms the permittee has deemed necessary to implement the PCP. The permittee shall use experience gained during Phase 1 and Phase 2 to inform the updated legal analysis. The permittee shall adopt necessary regulatory changes as soon as possible to implement the Phase 3 Plan.

Description of Phase 3 planned non-structural controls – The permittee shall describe the non-structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-5. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation in units of mass/yr. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F.

Description of planned Phase 3 structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of phosphorus control practices during Phase 3. The ranking shall build upon the ranking developed for

Phase 1 and 2. The permittee shall describe the structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-5. The description of structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party may be included in a municipal PCP. Annual phosphorus reduction from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F.

Updated description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish an Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1, 2 and 3 of the PCP. This includes BMPs implemented to date as well as BMPs to be implemented during Phase 3 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule for each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.

Phase 3 Implementation Schedule – A schedule for implementation of all planned Phase 3 BMPs, including, as appropriate: funding, training, purchasing, construction, inspections, monitoring, O&M activities and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the Phase 3 Plan. Structural BMPs shall be designed and constructed to ensure the permittee will comply with the 18 and 20 year milestones established in Table F-5. The Phase 3 plan shall be fully implemented as soon as possible, but no later than 20 years after the effective date of permit.

Estimated cost for implementing Phase 3 of the PCP – The permittee shall estimate the cost of implementing the Phase 3 non-structural and structural controls and associated Operation and Maintenance Program. This cost estimate can be used to plan for the full implementation of Phase 3.

Complete written Phase 3 Plan – The permittee must complete the written Phase 3 Plan of the PCP no later than 15 years after the permit effective date. The complete Phase 3 Plan shall include Phase 3 PCP item numbers 3-1 through 3-6 in Table F-5. The permittee shall make the Phase 3 Plan available to the public for public comment during Phase 3 Plan development. EPA encourages the permittee to post the Phase 3 Plan online to facilitate public involvement.

Performance Evaluation – The permittee shall evaluate the effectiveness of the PCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs[9] and tracking increases resulting from development. Phosphorus reductions shall be calculated consistent with Attachment 2 to Appendix F (non-structural BMP

[9] See footnote 9

performance) and Attachment 3 to Appendix F (structural BMP performance) for all BMPs implemented to date. Phosphorus export increases due to development shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus loading increases and reductions in unit of mass/yr shall be added or subtracted from the applicable Baseline Phosphorus Load given in Table F-2 or Table F-3 depending on the Scope of PCP chosen to estimate the yearly phosphorous export rate from the PCP Area. The permittee shall also include all information required in part I.2 of this Appendix in each performance evaluation. Performance evaluations will be included as part of each permittee's annual report as required by part 4.4 of the Permit.

2. Reporting

Beginning 1 year after the permit effective date, the permittee shall include a progress report in each annual report on the planning and implementation of the PCP.

Beginning five (5) years after the permit effective date, the permittee shall include the following in each annual report submitted pursuant to part 4.4 of the Permit:

a. All non-structural control measures implemented during the reporting year along with the phosphorus reduction in mass/yr (P_{NSred}) calculated consistent with Attachment 2 to Appendix F
b. Structural controls implemented during the reporting year and all previous years including:
    a. Location information of structural BMPs (GPS coordinates or street address)
    b. Phosphorus reduction from all structural BMPs implemented to date in mass/yr (P_{Sred}) calculated consistent with Attachment 3 to Appendix F
    c. Date of last completed maintenance and inspection for each Structural control
c. Phosphorus load increases due to development over the previous reporting period and incurred since 2005 (P_{DEVinc}) calculated consistent with Attachment 1 to Appendix F.
d. Estimated yearly phosphorus export rate (P_{exp}) from the PCP Area calculated using Equation 2. Equation 2 calculates the yearly phosphorus export rate by subtracting yearly phosphorus reductions through implemented nonstructural controls and structural controls to date from the Baseline Phosphorus Load and adding loading increases incurred through development to date. This equation shall be used to demonstrate compliance with the phosphorus reduction milestones required as part of each phase of the PCP.

$$P_{exp}\left(\frac{mass}{yr}\right) = P_{base}\left(\frac{mass}{yr}\right) - \left(P_{Sred}\left(\frac{mass}{yr}\right) + P_{NSred}\left(\frac{mass}{yr}\right)\right) + P_{DEVinc}\left(\frac{mass}{yr}\right)$$

Equation 1. Equation used to calculate yearly phosphorus export rate from the chosen PCP Area. P_{exp}=Current phosphorus export rate from the PCP Area in mass/year. P_{base}=baseline phosphorus export rate from LPCP Area in mass/year. P_{Sred}= yearly phosphorus reduction from implemented structural controls in the PCP Area in mass/year. P_{NSred}= yearly phosphorus reduction from implemented non-structural controls in the PCP Area in mass/year. P_{DEVinc}= yearly phosphorus increase resulting from development since 2005 in the PCP Area in mass/year.

e. Certification that all structural BMPs are being inspected and maintained according to the O&M program specified as part of the PCP. The certification statement shall be:

I certify under penalty of law that all source control and treatment Best Management Practices being claimed for phosphorus reduction credit have been inspected, maintained and repaired in accordance with manufacturer or design specification. I certify that, to the best of my knowledge, all Best Management Practices being claimed for a phosphorus reduction credit are performing as originally designed.

f. Certification that all municipally owned and maintained turf grass areas are being managed in accordance with Massachusetts Regulation 331 CMR 31 pertaining to proper use of fertilizers on turf grasses (see http://www.mass.gov/courts/docs/lawlib/300-399cmr/330cmr31.pdf).

3. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part A.I.1. as follows.
   a. The permittee is relieved of its additional requirements as of the date when the following conditions are met:
      i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of phosphorus are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
   b. When the criteria in Appendix F part A.I.3.a. are met, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part A.I.1 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 F part A.I.1 to date to reduce phosphorus in their 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 F part A.I.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications, and the reporting requirements of Appendix F part I.2. remain in place.

II. Lake and Pond Phosphorus TMDL Requirements

Between 1999 and 2010 EPA has approved 13 Lake TMDLs[10] completed by MassDEP covering 78 lakes and ponds within the Commonwealth of Massachusetts. Any permittee (traditional or non-traditional) that discharges to a waterbody segment in Table F-6 is subject to the requirements of this part.

1. Permittees that operate regulated MS4s (traditional and non-traditional) that discharge to the identified impaired waters or their tributaries must reduce phosphorus discharges to support achievement of phosphorus load reductions identified in the TMDLs. To address phosphorus, all permittees with a phosphorus reduction requirement greater than 0% shall develop a Lake Phosphorus Control Plan (LPCP) designed to reduce the amount of phosphorus in stormwater discharges from its MS4 to the impaired waterbody or its tributaries in accordance with the phosphorus load reduction requirements set forth in Table F-6 below. Permittees discharging to waterbodies in Table F-6 with an associated 0% Phosphorus Required Percent Reduction are subject to Appendix F part II.2.f and are relieved of the requirements of Appendix F part II.1.i through Appendix F part II.2.e Table F-6 identifies the primary municipalities[11] located within the watershed of the respective lake or pond and the percent phosphorus reductions necessary from urban stormwater sources. Any permittee (traditional or non-traditional) that discharges to a lake or pond listed in Table F-6 or its tributaries is subject to the same phosphorus percent reduction requirements associated with that lake or pond.

Primary Municipality	Waterbody Name	Required Percent Reduction
Auburn	Leesville Pond	31%
	Auburn Pond	24%
	Eddy Pond	0%
	Pondville Pond	8%
	Stoneville Pond	3%
Charlton	Buffumville Lake	28%
	Dresser Hill Pond	17%
	Gore Pond	14%
	Granite Reservoir	11%
	Jones Pond	13%
	Pierpoint Meadow Pond	27%
	Pikes Pond	38%
Dudley	Gore Pond	14%

[10] Final TMDLs for lakes and ponds in the Northern Blackstone River Watershed, Chicopee Basin, Connecticut Basin, French Basin, Millers Basin and Bare Hill Pond, Flint Pond, Indian Lake, Lake Boon, Leesville Pond, Salisbury Pond, White Island Pond, Quaboag Pond and Quacumquasit Pond can be found here: http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html

[11] Primary municipalities indicate the municipality in which the majority of the lake or pond is located but does not necessarily indicate each municipality that has urbanized area that discharges to the lake or pond or its tributaries.

Primary Municipality	Waterbody Name	Required Percent Reduction
	Larner Pond	55%
	New Pond	56%
	Pierpoint Meadow Pond	27%
	Shepherd Pond	25%
	Tobins Pond	62%
	Wallis Pond	54%
Gardner	Hilchey Pond	27%
	Parker Pond	47%
	Bents Pond	52%
	Ramsdall Pond	49%
Grafton	Flint Pond/Lake Quinsigamond	59%
Granby	Aldrich Lake East	0%
Hadley	Lake Warner	24%
Harvard	Bare Hill Pond	2%
Hudson	Lake Boon	28%
Leicester	Smiths Pond	30%
	Southwick Pond	64%
	Cedar Meadow Pond	17%
	Dutton Pond	23%
	Greenville Pond	14%
	Rochdale Pond	8%
Ludlow	Minechoag Pond	48%
Millbury	Brierly Pond	14%
	Dorothy Pond	1%
	Howe Reservoir	48%
Oxford	Buffumville Lake	28%
	Hudson Pond	37%
	Lowes Pond	51%
	McKinstry Pond	79%
	Robinson Pond	8%
	Texas Pond	21%
Shrewsbury	Flint Pond/Lake Quinsigamond	49%
	Jordan Pond	60%
	Mill Pond	43%
	Newton Pond	19%
	Shirley Street Pond	30%
Spencer	Quaboag Pond	29%

Primary Municipality	Waterbody Name	Required Percent Reduction
	Quacumquasit Pond	2%
	Jones Pond	13%
	Sugden Reservoir	31%
Springfield	Loon Pond	10%
	Long Pond	56%
	Mona Lake	57%
Stow	Lake Boon	28%
Templeton	Brazell Pond	62%
	Depot Pond	50%
	Bourn-Hadley Pond	49%
	Greenwood Pond 2	56%
Wilbraham	Spectacle Pond	45%
Winchendon	Lake Denison	22%
	Stoddard Pond	24%
	Whitney Pond	16%
	Whites Mill Pond	21%

Table F-6: Phosphorus impaired Lakes or Ponds subject to a TMDL along with primary municipality and required percent reduction of phosphorus from urban stormwater sources

i. The LPCP shall be implemented in accordance with the following schedule and contain the following elements:

a. LPCP Implementation Schedule – The permittee shall complete its LPCP and fully implement all of the control measures in its LPCP as soon as possible but no later than 15 years after the effective date of the permit.

b. The LPCP shall be implemented in accordance with the following schedule and contain the following elements:

Number	LPCP Component and Milestones	Completion Date
1	Legal Analysis	2 years after permit effective date
2	Funding source assessment	3 years after permit effective date
3	Define LPCP scope (LPCP Area)	4 years after permit effective date
4	Calculate Baseline Phosphorus, Allowable Phosphorus Load and Phosphorus Reduction Requirement	4 years after permit effective date

5	Description of planned nonstructural and structural controls	5 years after permit effective date
6	Description of Operation and Maintenance (O&M) Program	5 years after permit effective date
7	Implementation schedule	5 years after permit effective date
8	Cost and Funding Source Assessment	5 years after permit effective date
9	Complete written LPCP	5 years after permit effective date
10	Full implementation of nonstructural controls.	6 years after permit effective date
11	Performance Evaluation.	6 and 7 years after permit effective date
12	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the LPCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.80 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.80)$	8 years after permit effective date
13	Performance Evaluation	9 years after permit effective date
14	1. Performance Evaluation. 2. Update LPCP 3. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the LPCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.60 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.60)$ OR that the permittee has reduced their phosphorus export rate by 30kg/year (whichever is greater, unless full Phosphorus Reduction Requirement has been met)	10years after permit effective date
15	Performance Evaluation	11 and 12 years after permit effective date
16	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the LPCP Area in mass/yr is equal to or less than the applicable Allowable	13years after permit effective date

	Phosphorus Load(P_{allow}) plus the applicable Phosphorus Reduction Requirement (P_{RR}) multiplied by 0.30 $P_{exp} \leq P_{allow} + (P_{RR}\ X\ 0.30)$	
17	Performance Evaluation	14 years after permit effective date
18	1. Performance Evaluation. 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate (P_{exp}) from the LPCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load(P_{allow}) $P_{exp} \leq P_{allow}$	15years after permit effective date

Table F-7: LPCP components and milestones

c. Description of LPCP Components:

Legal Analysis- The permittee shall develop and implement an analysis that identifies existing regulatory mechanisms available to the MS4 such as by-laws and ordinances and describes any changes to these regulatory mechanisms that may be necessary to effectively implement the LPCP. This may include the creation or amendment of financial and regulatory authorities. The permittee shall adopt necessary regulatory changes by the end of the permit term.

Scope of the LPCP (LPCP Area) - The permittee shall indicate the area in which the permittee plans to implement the LPCP, this area is known as the "LPCP Area". The permittee must choose one of the following: 1) to implement its LPCP in the entire area within its jurisdiction discharging to the impaired waterbody (for a municipality this would be the municipal boundary) or 2) to implement its LPCP in only the urbanized area portion of its jurisdiction discharging to the impaired waterbody. If the permittee chooses to implement the LPCP in its entire jurisdiction discharging to the impaired waterbody, the permittee may demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural and non-structural controls on discharges that occur both inside and outside the urbanized area. If the permittee chooses to implement the LPCP in its urbanized area only discharging to the impaired waterbody, the permittee must demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural and non-structural controls on discharges that occur within the urbanized area only.

Calculate Baseline Phosphorus Load (P_{base}), Phosphorus Reduction Requirement (P_{RR}) and Allowable Phosphorus Load (P_{allow}) –Permittees shall calculate their numerical Allowable Phosphorus Load and Phosphorus Reduction Requirement in mass/yr by first estimating their Baseline Phosphorus Load in mass/yr from its LPCP Area consistent with the methodology in Attachment 1 to Appendix F, the baseline shall only be estimated using land use phosphorus export coefficients in Attachment 1 to Appendix F and not account for phosphorus reductions resulting from implemented structural BMPs completed to date. Table F-6 contains the

percent phosphorus reduction required from urban stormwater consistent with the TMDL of each impaired waterbody. The permittee shall apply the applicable required percent reduction in Table F-6 to the calculated Baseline Phosphorus Load to obtain the permittee specific Allowable Phosphorus Load. The Allowable Phosphorus Load shall then be subtracted from the Baseline Phosphorus Load to obtain the permittee specific Phosphorus Reduction Requirement in mass/yr.

Description of planned non-structural controls – The permittee shall describe the non-structural stormwater control measures to be implemented to support the achievement of the milestones in Table F-7. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F. The permittee shall update the description of planned non-structural controls as needed to support the achievement of the milestones in Table F-7, including an update in the updated written LPCP 10 years after the permit effective date.

Description of planned structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of phosphorus control practices. The ranking shall be developed through the use of available screening and monitoring results collected during the permit term either by the permittee or another entity and the mapping required pursuant to part 2.3.4.6 of the Permit. The permittee shall also include in this prioritization a detailed assessment of site suitability for potential phosphorus control measures based on soil types and other factors. The permittee shall coordinate this activity with the requirements of part 2.3.6.8.b of the Permit. A description and the result of this priority ranking shall be included in the LPCP. The permittee shall describe the structural stormwater control measures necessary to support achievement of the milestones in Table F-7. The description of structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party may be included in the LPCP. Annual phosphorus reduction from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F. The permittee shall update the description of planned structural controls as needed to support the achievement of the milestones in Table F-7, including an update in the updated written LPCP 10 years after the permit effective date.

Description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish an Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1 and 2 of the PCP. This includes BMPs implemented to date as well as BMPs to be implemented during Phase 2 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule for each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.

Implementation Schedule – An initial schedule for implementing the BMPs, including, as appropriate: funding, training, purchasing, construction, inspections, monitoring, O&M and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the LPCP, and all non-structural BMPs shall be fully implemented within six years of the permit effective date. Where planned structural BMP retrofits or major drainage infrastructure projects are expected to take additional time to construct, the permittee shall within four years of the effective date of the permit have a schedule for completion of construction consistent with the reduction requirements in Table F-7. The permittee shall complete the implementation of its LPCP as soon as possible or at a minimum in accordance with the milestones set forth in Table F-7. The implementation schedule shall be updated as needed to support the achievement of the milestones in Table F-7, including an update in the updated written LPCP 10 years after the permit effective date.

Cost and funding source assessment – The permittee shall estimate the cost for implementing its LPCP and describe known and anticipated funding mechanisms. The permittee shall describe the steps it will take to implement its funding plan. This may include but is not limited to conceptual development, outreach to affected parties, and development of legal authorities.

Complete written LPCP – The permittee must complete the written LPCP 5 years after permit effective date. The complete LPCP shall include item numbers 1-8 in Table F-7. The permittee shall make the LPCP available to the public for public comment during the LPCP development. EPA encourages the permittee to post the LPCP online to facilitate public involvement. The LPCP shall be updated as needed with an update 10 years after the permit effective date at a minimum to reflect changes in BMP implementation to support achievement of the phosphorus export milestones in Table F-7. The updated LPCP shall build upon the original LPCP and include additional or new BMPs the permittee will use to support the achievement of the milestones in Table F-7.

Performance Evaluation – The permittee shall evaluate the effectiveness of the LPCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs[12] and tracking increases in phosphorus loading from the LPCP Area beginning six years after the effective date of the permit. Phosphorus reductions shall be calculated consistent with Attachment 2 (non-structural BMP performance), Attachment 3 (structural BMP performance) and Attachment 1 (reductions through land use change), to Appendix F for all BMPs implemented to date[13]. Phosphorus load increases resulting from development shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus

[12] In meeting its phosphorus reduction requirements a permittee may quantify phosphorus reductions by actions undertaken by another entity, except where those actions are credited to MassDOT or another permittee identified in Appendix F Table F-7

[13] Annual phosphorus reductions from structural BMPs installed in the LPCP Area prior to the effective date of this permit shall be calculated consistent with Attachment 3 to Appendix F. Phosphorus Reduction Credit for previously installed BMPs will only be given if the Permittee demonstrates that the BMP is performing up to design specifications and certifies that the BMP is properly maintained and inspected according to manufacturer design or specifications. This certification shall be part of the annual performance evaluation during the year credit is claimed for the previously installed BMP.

loading increases and reductions in units of mass/yr shall be added or subtracted from the calculated Baseline Phosphorus Load to estimate the yearly phosphorous export rate from the LPCP Area in mass/yr. The permittee shall also include all information required in part II.2 of this Appendix in each performance evaluation.

2. Reporting

Beginning 1 year after the permit effective date, the permittee shall include a progress report in each annual report on the planning and implementation of the LPCP.

Beginning five (5) years after the permit effective date, the permittee shall include the following in each annual report submitted pursuant to part 4.4 of the Permit:

a. All non-structural control measures implemented during the reporting year along with the phosphorus reduction in mass/yr (P_{NSred}) calculated consistent with Attachment 2 to Appendix F
b. Structural controls implemented during the reporting year and all previous years including:
    a. Location information of structural BMPs (GPS coordinates or street address)
    b. Phosphorus reduction from all structural BMPs implemented to date in mass/yr (P_{Sred}) calculated consistent with Attachment 3 to Appendix F
    c. Date of last completed maintenance for each Structural control
c. Phosphorus load increases due to development over the previous reporting period and incurred to date (P_{DEVinc}) calculated consistent with Attachment 1 to Appendix F.
d. Estimated yearly phosphorus export rate (P_{exp}) from the LPCP Area calculated using Equation 2. Equation2 calculates the yearly phosphorus export rate by subtracting yearly phosphorus reductions through implemented nonstructural controls and structural controls to date from the Baseline Phosphorus Load and adding loading increases incurred through development to date. This equation shall be used to demonstrate compliance with the phosphorus reduction milestones required as part of each phase of the LPCP.

$$P_{exp}\left(\frac{mass}{yr}\right) = P_{base}\left(\frac{mass}{yr}\right) - \left(P_{Sred}\left(\frac{mass}{yr}\right) + P_{NSred}\left(\frac{mass}{yr}\right)\right) + P_{DEVinc}\left(\frac{mass}{yr}\right)$$

Equation 2. Equation used to calculate yearly phosphorus export rate from the chosen LPCP Area. P_{exp}=Current phosphorus export rate from the LPCP Area in mass/year. P_{base}=baseline phosphorus export rate from LPCP Area in mass/year. P_{Sred}= yearly phosphorus reduction from implemented structural controls in the LPCP Area in mass/year. P_{NSred}= yearly phosphorus reduction from implemented non-structural controls in the LPCP Area in mass/year. Area in mass/year. P_{DEVinc}= yearly phosphorus increase resulting from development since the year baseline loading was calculated in the LPCP Area in mass/year.

e. Certification that all structural BMPs are being inspected and maintained according to the O&M program specified as part of the PCP. The certification statement shall be:

I certify under penalty of law that all source control and treatment Best Management Practices being claimed for phosphorus reduction credit have been inspected, maintained and repaired in accordance with manufacturer or design specification. I certify that, to the best of my knowledge, all Best Management

Practices being claimed for a phosphorus reduction credit are performing as originally designed.

f. Certification that all municipally owned and maintained turf grass areas are being managed in accordance with Massachusetts Regulation 331 CMR 31 pertaining to proper use of fertilizers on turf grasses (see http://www.mass.gov/courts/docs/lawlib/300-399cmr/330cmr31.pdf).

3. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part A.II.1. as follows:
   a. The permittee is relieved of its additional requirements as of the date when the following conditions are met:
      i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of phosphorus are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
   b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any additional remaining requirements of Appendix F part A.II.1 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 F part A.II.1 to date to reduce phosphorus in their 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 F part A.I.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications, and the reporting requirements of Appendix F part A.II.2. remain in place.

III. Bacteria and Pathogen TMDL Requirements

There are currently approved 16 approved bacteria (fecal coliform bacteria) or mixed pathogen (fecal coliform, E. coli, and/or enterococcus bacteria) TMDLs for certain waterbodies in Massachusetts.[14] Any permittee (traditional or non-traditional) that discharges to a waterbody segment in Table F-8 is subject to the requirements of this part.

1. Traditional and non-traditional MS4s operating in the municipalities listed in Table F-8 and/or that discharge to a waterbody listed on Table F-8 shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below:

    a. Enhanced BMPs

        i. Enhancement of BMPs required by part 2.3 of the permit that shall be implemented during this permit term:

            1. part 2.3.3. Public Education: 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, II and III as well as Appendix F part A.IV, A.V, B.I, B.II and B.III where appropriate.

            2. part 2.3.4 Illicit Discharge: 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.

Primary Municipality	Segment ID	Waterbody Name	Indicator Organism
Abington	MA62-09	Beaver Brook	Escherichia Coli (E. Coli)
Abington	MA62-33	Shumatuscacant River	Escherichia Coli (E. Coli)
Acushnet	MA95-31	Acushnet River	Escherichia Coli (E. Coli)
Acushnet	MA95-32	Acushnet River	Escherichia Coli (E. Coli)
Acushnet	MA95-33	Acushnet River	Fecal Coliform

[14] Final bacteria or pathogen TMDLs can be found here: http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html

Andover	MA83-04	Rogers Brook	Fecal Coliform
Andover	MA83-15	Unnamed Tributary	Fecal Coliform
Andover	MA83-18	Shawsheen River	Fecal Coliform
Andover	MA83-19	Shawsheen River	Fecal Coliform
Avon	MA62-07	Trout Brook	Escherichia Coli (E. Coli)
Barnstable	MA96-01	Barnstable Harbor	Fecal Coliform
Barnstable	MA96-02	Bumps River	Fecal Coliform
Barnstable	MA96-04	Centerville River	Fecal Coliform
Barnstable	MA96-05	Hyannis Harbor	Fecal Coliform
Barnstable	MA96-06	Maraspin Creek	Fecal Coliform
Barnstable	MA96-07	Prince Cove	Fecal Coliform
Barnstable	MA96-08	Shoestring Bay	Fecal Coliform
Barnstable	MA96-36	Lewis Bay	Fecal Coliform
Barnstable	MA96-37	Mill Creek	Fecal Coliform
Barnstable	MA96-63	Cotuit Bay	Fecal Coliform
Barnstable	MA96-64	Seapuit River	Fecal Coliform
Barnstable	MA96-66	North Bay	Fecal Coliform
Barnstable	MA96-81	Snows Creek	Fecal Coliform
Barnstable	MA96-82	Hyannis Inner Harbor	Fecal Coliform
Barnstable	MA96-92	Santuit River	Fecal Coliform
Barnstable	MA96-93	Halls Creek	Fecal Coliform
Barnstable	MA96-94	Stewarts Creek	Fecal Coliform
Bedford	MA83-01	Shawsheen River	Fecal Coliform
Bedford	MA83-05	Elm Brook	Fecal Coliform
Bedford	MA83-06	Vine Brook	Fecal Coliform
Bedford	MA83-08	Shawsheen River	Fecal Coliform
Bedford	MA83-10	Kiln Brook	Fecal Coliform
Bedford	MA83-14	Spring Brook	Fecal Coliform
Bedford	MA83-17	Shawsheen River	Fecal Coliform
Bellingham	MA72-03	Charles River	Pathogens
Bellingham	MA72-04	Charles River	Pathogens
Belmont	MA72-28	Beaver Brook	Pathogens
Berkley	MA62-02	Taunton River	Fecal Coliform
Berkley	MA62-03	Taunton River	Fecal Coliform
Berkley	MA62-20	Assonet River	Fecal Coliform
Beverly	MA93-08	Bass River	Fecal Coliform
Beverly	MA93-09	Danvers River	Fecal Coliform
Beverly	MA93-20	Beverly Harbor	Fecal Coliform
Beverly	MA93-25	Salem Sound	Fecal Coliform
Billerica	MA83-14	Spring Brook	Fecal Coliform
Billerica	MA83-17	Shawsheen River	Fecal Coliform

Billerica	MA83-18	Shawsheen River	Fecal Coliform
Bourne	MA95-01	Buttermilk Bay	Fecal Coliform
Bourne	MA95-14	Cape Cod Canal	Fecal Coliform
Bourne	MA95-15	Phinneys Harbor	Fecal Coliform
Bourne	MA95-16	Pocasset River	Fecal Coliform
Bourne	MA95-17	Pocasset Harbor	Fecal Coliform
Bourne	MA95-18	Red Brook Harbor	Fecal Coliform
Bourne	MA95-47	Back River	Fecal Coliform
Bourne	MA95-48	Eel Pond	Fecal Coliform
Brewster	MA96-09	Quivett Creek	Fecal Coliform
Brewster	MA96-27	Namskaket Creek	Fecal Coliform
Bridgewater	MA62-32	Matfield River	Escherichia Coli (E. Coli)
Brockton	MA62-05	Salisbury Plain River	Escherichia Coli (E. Coli)
Brockton	MA62-06	Salisbury Plain River	Escherichia Coli (E. Coli)
Brockton	MA62-07	Trout Brook	Escherichia Coli (E. Coli)
Brockton	MA62-08	Salisbury Brook	Escherichia Coli (E. Coli)
Brockton	MA62-09	Beaver Brook	Escherichia Coli (E. Coli)
Brookline	MA72-11	Muddy River	Pathogens
Burlington	MA83-06	Vine Brook	Fecal Coliform
Burlington	MA83-11	Long Meadow Brook	Fecal Coliform
Burlington	MA83-13	Sandy Brook	Fecal Coliform
Cambridge	MA72-36	Charles River	Pathogens
Cambridge	MA72-38	Charles River	Pathogens
Canton	MA73-01	Neponset River	Fecal Coliform
Canton	MA73-01	Neponset River	Escherichia Coli (E. Coli)
Canton	MA73-02	Neponset River	Fecal Coliform
Canton	MA73-05	East Branch	Fecal Coliform
Canton	MA73-20	Beaver Meadow Brook	Fecal Coliform
Canton	MA73-22	Pequid Brook	Fecal Coliform
Canton	MA73-25	Pecunit Brook	Escherichia Coli (E. Coli)
Canton	MA73-27	Ponkapog Brook	Fecal Coliform
Chatham	MA96-11	Stage Harbor	Fecal Coliform
Chatham	MA96-41	Mill Creek	Fecal Coliform
Chatham	MA96-42	Taylors Pond	Fecal Coliform
Chatham	MA96-43	Harding Beach Pond	Fecal Coliform
Chatham	MA96-44	Bucks Creek	Fecal Coliform
Chatham	MA96-45	Oyster Pond	Fecal Coliform
Chatham	MA96-46	Oyster Pond River	Fecal Coliform
Chatham	MA96-49	Frost Fish Creek	Pathogens
Chatham	MA96-50	Ryder Cove	Fecal Coliform
Chatham	MA96-51	Muddy Creek	Pathogens

Chatham	MA96-79	Cockle Cove Creek	Fecal Coliform
Chatham	MA96-79	Cockle Cove Creek	Enterococcus Bacteria
Cohasset	MA94-01	Cohasset Harbor	Fecal Coliform
Cohasset	MA94-19	The Gulf	Fecal Coliform
Cohasset	MA94-20	Little Harbor	Fecal Coliform
Cohasset	MA94-32	Cohasset Cove	Fecal Coliform
Concord	MA83-05	Elm Brook	Fecal Coliform
Danvers	MA93-01	Waters River	Fecal Coliform
Danvers	MA93-02	Crane Brook	Escherichia Coli (E. Coli)
Danvers	MA93-04	Porter River	Fecal Coliform
Danvers	MA93-09	Danvers River	Fecal Coliform
Danvers	MA93-36	Frost Fish Brook	Escherichia Coli (E. Coli)
Danvers	MA93-41	Crane River	Fecal Coliform
Dartmouth	MA95-13	Buttonwood Brook	Escherichia Coli (E. Coli)
Dartmouth	MA95-34	Slocums River	Fecal Coliform
Dartmouth	MA95-38	Clarks Cove	Fecal Coliform
Dartmouth	MA95-39	Apponagansett Bay	Fecal Coliform
Dartmouth	MA95-40	East Branch Westport River	Escherichia Coli (E. Coli)
Dartmouth	MA95-62	Buzzards Bay	Fecal Coliform
Dedham	MA72-07	Charles River	Pathogens
Dedham	MA72-21	Rock Meadow Brook	Pathogens
Dedham	MA73-02	Neponset River	Fecal Coliform
Dennis	MA96-09	Quivett Creek	Fecal Coliform
Dennis	MA96-12	Bass River	Fecal Coliform
Dennis	MA96-13	Sesuit Creek	Fecal Coliform
Dennis	MA96-14	Swan Pond River	Fecal Coliform
Dennis	MA96-35	Chase Garden Creek	Fecal Coliform
Dighton	MA62-02	Taunton River	Fecal Coliform
Dighton	MA62-03	Taunton River	Fecal Coliform
Dighton	MA62-50	Broad Cove	Fecal Coliform
Dighton	MA62-51	Muddy Cove Brook	Fecal Coliform
Dighton	MA62-55	Segreganset River	Fecal Coliform
Dighton	MA62-56	Three Mile River	Escherichia Coli (E. Coli)
Dighton	MA62-57	Three Mile River	Fecal Coliform
Dover	MA72-05	Charles River	Pathogens
Dover	MA72-06	Charles River	Pathogens
Duxbury	MA94-15	Duxbury Bay	Fecal Coliform
Duxbury	MA94-30	Bluefish River	Fecal Coliform
East Bridgewater	MA62-06	Salisbury Plain River	Escherichia Coli (E. Coli)
East Bridgewater	MA62-09	Beaver Brook	Escherichia Coli (E. Coli)
East Bridgewater	MA62-32	Matfield River	Escherichia Coli (E. Coli)

East Bridgewater	MA62-33	Shumatuscacant River	Escherichia Coli (E. Coli)
East Bridgewater	MA62-38	Meadow Brook	Escherichia Coli (E. Coli)
Eastham	MA96-15	Boat Meadow River	Fecal Coliform
Eastham	MA96-16	Rock Harbor Creek	Fecal Coliform
Eastham	MA96-34	Wellfleet Harbor	Fecal Coliform
Eastham	MA96-68	Town Cove	Fecal Coliform
Essex	MA93-11	Essex River	Fecal Coliform
Essex	MA93-16	Essex Bay	Fecal Coliform
Essex	MA93-45	Alewife Brook	Escherichia Coli (E. Coli)
Essex	MA93-46	Alewife Brook	Fecal Coliform
Everett	MA93-51	Unnamed Tributary	Enterococcus Bacteria
Fairhaven	MA95-33	Acushnet River	Fecal Coliform
Fairhaven	MA95-42	New Bedford Inner Harbor	Fecal Coliform
Fairhaven	MA95-62	Buzzards Bay	Fecal Coliform
Fairhaven	MA95-63	Outer New Bedford Harbor	Fecal Coliform
Fairhaven	MA95-64	Little Bay	Fecal Coliform
Fairhaven	MA95-65	Nasketucket Bay	Fecal Coliform
Fall River	MA61-06	Mount Hope Bay	Fecal Coliform
Fall River	MA62-04	Taunton River	Fecal Coliform
Falmouth	MA95-20	Wild Harbor	Fecal Coliform
Falmouth	MA95-21	Herring Brook	Fecal Coliform
Falmouth	MA95-22	West Falmouth Harbor	Fecal Coliform
Falmouth	MA95-23	Great Sippewisset Creek	Fecal Coliform
Falmouth	MA95-24	Little Sippewisset Marsh	Fecal Coliform
Falmouth	MA95-25	Quissett Harbor	Fecal Coliform
Falmouth	MA95-46	Harbor Head	Fecal Coliform
Falmouth	MA96-17	Falmouth Inner Harbor	Fecal Coliform
Falmouth	MA96-18	Great Harbor	Fecal Coliform
Falmouth	MA96-19	Little Harbor	Fecal Coliform
Falmouth	MA96-20	Quashnet River	Fecal Coliform
Falmouth	MA96-21	Waquoit Bay	Fecal Coliform
Falmouth	MA96-53	Perch Pond	Fecal Coliform
Falmouth	MA96-54	Great Pond	Fecal Coliform
Falmouth	MA96-55	Green Pond	Fecal Coliform
Falmouth	MA96-56	Little Pond	Fecal Coliform
Falmouth	MA96-57	Bournes Pond	Fecal Coliform
Falmouth	MA96-58	Hamblin Pond	Fecal Coliform
Falmouth	MA96-62	Oyster Pond	Fecal Coliform
Foxborough	MA62-39	Rumford River	Escherichia Coli (E. Coli)
Foxborough	MA62-47	Wading River	Escherichia Coli (E. Coli)
Foxborough	MA73-01	Neponset River	Fecal Coliform

Foxborough	MA73-01	Neponset River	Escherichia Coli (E. Coli)
Franklin	MA72-04	Charles River	Pathogens
Freetown	MA62-04	Taunton River	Fecal Coliform
Freetown	MA62-20	Assonet River	Fecal Coliform
Gloucester	MA93-12	Annisquam River	Fecal Coliform
Gloucester	MA93-16	Essex Bay	Fecal Coliform
Gloucester	MA93-18	Gloucester Harbor	Fecal Coliform
Gloucester	MA93-28	Mill River	Fecal Coliform
Hanover	MA94-05	North River	Fecal Coliform
Hanover	MA94-21	Drinkwater River	Escherichia Coli (E. Coli)
Hanover	MA94-24	Iron Mine Brook	Escherichia Coli (E. Coli)
Hanover	MA94-27	Third Herring Brook	Escherichia Coli (E. Coli)
Hanson	MA62-33	Shumatuscacant River	Escherichia Coli (E. Coli)
Harwich	MA96-22	Herring River	Fecal Coliform
Harwich	MA96-23	Saquatucket Harbor	Fecal Coliform
Harwich	MA96-51	Muddy Creek	Pathogens
Holliston	MA72-16	Bogastow Brook	Pathogens
Hopedale	MA72-03	Charles River	Pathogens
Hopkinton	MA72-01	Charles River	Pathogens
Ipswich	MA93-16	Essex Bay	Fecal Coliform
Kingston	MA94-14	Jones River	Fecal Coliform
Kingston	MA94-15	Duxbury Bay	Fecal Coliform
Lawrence	MA83-19	Shawsheen River	Fecal Coliform
Lexington	MA72-28	Beaver Brook	Pathogens
Lexington	MA83-06	Vine Brook	Fecal Coliform
Lexington	MA83-10	Kiln Brook	Fecal Coliform
Lincoln	MA83-05	Elm Brook	Fecal Coliform
Lincoln	MA83-08	Shawsheen River	Fecal Coliform
Lynn	MA93-24	Nahant Bay	Fecal Coliform
Lynn	MA93-44	Saugus River	Fecal Coliform
Lynn	MA93-52	Lynn Harbor	Fecal Coliform
Lynnfield	MA93-30	Beaverdam Brook	Escherichia Coli (E. Coli)
Lynnfield	MA93-32	Hawkes Brook	Escherichia Coli (E. Coli)
Lynnfield	MA93-34	Saugus River	Escherichia Coli (E. Coli)
Lynnfield	MA93-35	Saugus River	Escherichia Coli (E. Coli)
Malden	MA93-51	Unnamed Tributary	Enterococcus Bacteria
Manchester	MA93-19	Manchester Harbor	Fecal Coliform
Manchester	MA93-25	Salem Sound	Fecal Coliform
Manchester	MA93-29	Cat Brook	Escherichia Coli (E. Coli)
Manchester	MA93-47	Causeway Brook	Escherichia Coli (E. Coli)
Mansfield	MA62-39	Rumford River	Escherichia Coli (E. Coli)

Mansfield	MA62-47	Wading River	Escherichia Coli (E. Coli)
Mansfield	MA62-49	Wading River	Escherichia Coli (E. Coli)
Marblehead	MA93-21	Salem Harbor	Fecal Coliform
Marblehead	MA93-22	Marblehead Harbor	Fecal Coliform
Marblehead	MA93-25	Salem Sound	Fecal Coliform
Marion	MA95-05	Weweantic River	Fecal Coliform
Marion	MA95-07	Sippican River	Fecal Coliform
Marion	MA95-08	Sippican Harbor	Fecal Coliform
Marion	MA95-09	Aucoot Cove	Fecal Coliform
Marion	MA95-56	Hammett Cove	Fecal Coliform
Marshfield	MA94-05	North River	Fecal Coliform
Marshfield	MA94-06	North River	Fecal Coliform
Marshfield	MA94-09	South River	Fecal Coliform
Marshfield	MA94-11	Green Harbor	Fecal Coliform
Mashpee	MA96-08	Shoestring Bay	Fecal Coliform
Mashpee	MA96-21	Waquoit Bay	Fecal Coliform
Mashpee	MA96-24	Mashpee River	Fecal Coliform
Mashpee	MA96-39	Popponesset Creek	Fecal Coliform
Mashpee	MA96-58	Hamblin Pond	Fecal Coliform
Mashpee	MA96-61	Little River	Fecal Coliform
Mashpee	MA96-92	Santuit River	Fecal Coliform
Mattapoisett	MA95-09	Aucoot Cove	Fecal Coliform
Mattapoisett	MA95-10	Hiller Cove	Fecal Coliform
Mattapoisett	MA95-35	Mattapoisett Harbor	Fecal Coliform
Mattapoisett	MA95-60	Mattapoisett River	Fecal Coliform
Mattapoisett	MA95-61	Eel Pond	Fecal Coliform
Mattapoisett	MA95-65	Nasketucket Bay	Fecal Coliform
Medfield	MA72-05	Charles River	Pathogens
Medfield	MA72-10	Stop River	Pathogens
Medfield	MA73-09	Mine Brook	Fecal Coliform
Medway	MA72-04	Charles River	Pathogens
Medway	MA72-05	Charles River	Pathogens
Melrose	MA93-48	Bennetts Pond Brook	Escherichia Coli (E. Coli)
Mendon	MA72-03	Charles River	Pathogens
Milford	MA72-01	Charles River	Pathogens
Millis	MA72-05	Charles River	Pathogens
Millis	MA72-16	Bogastow Brook	Pathogens
Milton	MA73-02	Neponset River	Fecal Coliform
Milton	MA73-03	Neponset River	Fecal Coliform
Milton	MA73-04	Neponset River	Fecal Coliform
Milton	MA73-26	Unquity Brook	Fecal Coliform

Milton	MA73-29	Pine Tree Brook	Fecal Coliform
Milton	MA73-30	Gulliver Creek	Fecal Coliform
Nahant	MA93-24	Nahant Bay	Fecal Coliform
Nahant	MA93-52	Lynn Harbor	Fecal Coliform
Nahant	MA93-53	Lynn Harbor	Fecal Coliform
Natick	MA72-05	Charles River	Pathogens
Natick	MA72-06	Charles River	Pathogens
Needham	MA72-06	Charles River	Pathogens
Needham	MA72-07	Charles River	Pathogens
Needham	MA72-18	Fuller Brook	Pathogens
Needham	MA72-21	Rock Meadow Brook	Pathogens
Needham	MA72-25	Rosemary Brook	Pathogens
New Bedford	MA95-13	Buttonwood Brook	Escherichia Coli (E. Coli)
New Bedford	MA95-33	Acushnet River	Fecal Coliform
New Bedford	MA95-38	Clarks Cove	Fecal Coliform
New Bedford	MA95-42	New Bedford Inner Harbor	Fecal Coliform
New Bedford	MA95-63	Outer New Bedford Harbor	Fecal Coliform
Newton	MA72-07	Charles River	Pathogens
Newton	MA72-23	Sawmill Brook	Pathogens
Newton	MA72-24	South Meadow Brook	Pathogens
Newton	MA72-29	Cheese Cake Brook	Pathogens
Newton	MA72-36	Charles River	Pathogens
Norfolk	MA72-05	Charles River	Pathogens
Norfolk	MA72-10	Stop River	Pathogens
North Andover	MA83-19	Shawsheen River	Fecal Coliform
Norton	MA62-49	Wading River	Escherichia Coli (E. Coli)
Norton	MA62-56	Three Mile River	Escherichia Coli (E. Coli)
Norwell	MA94-05	North River	Fecal Coliform
Norwell	MA94-27	Third Herring Brook	Escherichia Coli (E. Coli)
Norwell	MA94-31	Second Herring Brook	Fecal Coliform
Norwood	MA73-01	Neponset River	Fecal Coliform
Norwood	MA73-01	Neponset River	Escherichia Coli (E. Coli)
Norwood	MA73-02	Neponset River	Fecal Coliform
Norwood	MA73-15	Germany Brook	Fecal Coliform
Norwood	MA73-16	Hawes Brook	Fecal Coliform
Norwood	MA73-17	Traphole Brook	Fecal Coliform
Norwood	MA73-24	Purgatory Brook	Fecal Coliform
Norwood	MA73-33	Unnamed Tributary	Escherichia Coli (E. Coli)
Orleans	MA96-16	Rock Harbor Creek	Fecal Coliform
Orleans	MA96-26	Little Namskaket Creek	Fecal Coliform
Orleans	MA96-27	Namskaket Creek	Fecal Coliform

Orleans	MA96-68	Town Cove	Fecal Coliform
Orleans	MA96-72	Paw Wah Pond	Fecal Coliform
Orleans	MA96-73	Pochet Neck	Fecal Coliform
Orleans	MA96-76	The River	Fecal Coliform
Orleans	MA96-78	Little Pleasant Bay	Fecal Coliform
Peabody	MA93-01	Waters River	Fecal Coliform
Peabody	MA93-05	Goldthwait Brook	Escherichia Coli (E. Coli)
Peabody	MA93-39	Proctor Brook	Escherichia Coli (E. Coli)
Pembroke	MA94-05	North River	Fecal Coliform
Plymouth	MA94-15	Duxbury Bay	Fecal Coliform
Plymouth	MA94-16	Plymouth Harbor	Fecal Coliform
Plymouth	MA94-34	Ellisville Harbor	Fecal Coliform
Raynham	MA62-02	Taunton River	Fecal Coliform
Rehoboth	MA53-03	Palmer River	Pathogens
Rehoboth	MA53-04	Palmer River	Pathogens
Rehoboth	MA53-05	Palmer River	Pathogens
Rehoboth	MA53-07	Palmer River - West Branch	Pathogens
Rehoboth	MA53-08	Palmer River - East Branch	Pathogens
Rehoboth	MA53-09	Rumney Marsh Brook	Pathogens
Rehoboth	MA53-10	Beaver Dam Brook	Pathogens
Rehoboth	MA53-11	Bad Luck Brook	Pathogens
Rehoboth	MA53-12	Fullers Brook	Pathogens
Rehoboth	MA53-13	Clear Run Brook	Pathogens
Rehoboth	MA53-14	Torrey Creek	Pathogens
Rehoboth	MA53-15	Old Swamp Brook	Pathogens
Rehoboth	MA53-16	Rocky Run	Pathogens
Revere	MA93-15	Pines River	Fecal Coliform
Revere	MA93-44	Saugus River	Fecal Coliform
Revere	MA93-51	Unnamed Tributary	Enterococcus Bacteria
Revere	MA93-52	Lynn Harbor	Fecal Coliform
Revere	MA93-53	Lynn Harbor	Fecal Coliform
Rockland	MA94-03	French Stream	Escherichia Coli (E. Coli)
Rockport	MA93-17	Rockport Harbor	Fecal Coliform
Salem	MA93-09	Danvers River	Fecal Coliform
Salem	MA93-20	Beverly Harbor	Fecal Coliform
Salem	MA93-21	Salem Harbor	Fecal Coliform
Salem	MA93-25	Salem Sound	Fecal Coliform
Salem	MA93-39	Proctor Brook	Escherichia Coli (E. Coli)
Salem	MA93-40	Proctor Brook	Enterococcus Bacteria
Salem	MA93-42	North River	Fecal Coliform
Sandwich	MA95-14	Cape Cod Canal	Fecal Coliform

Sandwich	MA96-30	Scorton Creek	Fecal Coliform
Sandwich	MA96-84	Old Harbor Creek	Fecal Coliform
Sandwich	MA96-85	Mill Creek	Fecal Coliform
Sandwich	MA96-86	Dock Creek	Fecal Coliform
Sandwich	MA96-87	Springhill Creek	Fecal Coliform
Saugus	MA93-15	Pines River	Fecal Coliform
Saugus	MA93-33	Hawkes Brook	Escherichia Coli (E. Coli)
Saugus	MA93-35	Saugus River	Escherichia Coli (E. Coli)
Saugus	MA93-43	Saugus River	Fecal Coliform
Saugus	MA93-44	Saugus River	Fecal Coliform
Saugus	MA93-48	Bennetts Pond Brook	Escherichia Coli (E. Coli)
Saugus	MA93-49	Shute Brook	Fecal Coliform
Saugus	MA93-50	Shute Brook	Escherichia Coli (E. Coli)
Scituate	MA94-01	Cohasset Harbor	Fecal Coliform
Scituate	MA94-02	Scituate Harbor	Fecal Coliform
Scituate	MA94-05	North River	Fecal Coliform
Scituate	MA94-06	North River	Fecal Coliform
Scituate	MA94-07	Herring River	Fecal Coliform
Scituate	MA94-09	South River	Fecal Coliform
Scituate	MA94-19	The Gulf	Fecal Coliform
Scituate	MA94-32	Cohasset Cove	Fecal Coliform
Scituate	MA94-33	Musquashcut Pond	Fecal Coliform
Seekonk	MA53-01	Runnins River	Fecal Coliform
Seekonk	MA53-12	Fullers Brook	Pathogens
Seekonk	MA53-13	Clear Run Brook	Pathogens
Seekonk	MA53-14	Torrey Creek	Pathogens
Sharon	MA62-39	Rumford River	Escherichia Coli (E. Coli)
Sharon	MA73-17	Traphole Brook	Fecal Coliform
Sharon	MA73-31	Unnamed Tributary	Fecal Coliform
Sherborn	MA72-05	Charles River	Pathogens
Somerset	MA61-01	Lee River	Fecal Coliform
Somerset	MA61-02	Lee River	Fecal Coliform
Somerset	MA61-06	Mount Hope Bay	Fecal Coliform
Somerset	MA62-03	Taunton River	Fecal Coliform
Somerset	MA62-04	Taunton River	Fecal Coliform
Somerset	MA62-50	Broad Cove	Fecal Coliform
Stoughton	MA73-20	Beaver Meadow Brook	Fecal Coliform
Stoughton	MA73-32	Unnamed Tributary	Escherichia Coli (E. Coli)
Swampscott	MA93-24	Nahant Bay	Fecal Coliform
Swansea	MA53-03	Palmer River	Pathogens
Swansea	MA53-06	Warren River Pond	Fecal Coliform

Swansea	MA53-16	Rocky Run	Pathogens
Swansea	MA61-01	Lee River	Fecal Coliform
Swansea	MA61-02	Lee River	Fecal Coliform
Swansea	MA61-04	Cole River	Fecal Coliform
Swansea	MA61-07	Mount Hope Bay	Fecal Coliform
Swansea	MA61-08	Kickemuit River	Pathogens
Taunton	MA62-02	Taunton River	Fecal Coliform
Taunton	MA62-56	Three Mile River	Escherichia Coli (E. Coli)
Taunton	MA62-57	Three Mile River	Fecal Coliform
Tewksbury	MA83-07	Strong Water Brook	Fecal Coliform
Tewksbury	MA83-15	Unnamed Tributary	Fecal Coliform
Tewksbury	MA83-18	Shawsheen River	Fecal Coliform
Wakefield	MA93-31	Mill River	Escherichia Coli (E. Coli)
Wakefield	MA93-34	Saugus River	Escherichia Coli (E. Coli)
Wakefield	MA93-35	Saugus River	Escherichia Coli (E. Coli)
Walpole	MA72-10	Stop River	Pathogens
Walpole	MA73-01	Neponset River	Fecal Coliform
Walpole	MA73-01	Neponset River	Escherichia Coli (E. Coli)
Walpole	MA73-06	School Meadow Brook	Fecal Coliform
Walpole	MA73-09	Mine Brook	Fecal Coliform
Walpole	MA73-17	Traphole Brook	Fecal Coliform
Waltham	MA72-07	Charles River	Pathogens
Waltham	MA72-28	Beaver Brook	Pathogens
Wareham	MA95-01	Buttermilk Bay	Fecal Coliform
Wareham	MA95-02	Onset Bay	Fecal Coliform
Wareham	MA95-03	Wareham River	Fecal Coliform
Wareham	MA95-05	Weweantic River	Fecal Coliform
Wareham	MA95-07	Sippican River	Fecal Coliform
Wareham	MA95-29	Agawam River	Fecal Coliform
Wareham	MA95-49	Broad Marsh River	Fecal Coliform
Wareham	MA95-50	Wankinco River	Fecal Coliform
Wareham	MA95-51	Crooked River	Fecal Coliform
Wareham	MA95-52	Cedar Island Creek	Fecal Coliform
Wareham	MA95-53	Beaverdam Creek	Fecal Coliform
Watertown	MA72-07	Charles River	Pathogens
Watertown	MA72-30	Unnamed Tributary	Pathogens
Watertown	MA72-32	Unnamed Tributary	Pathogens
Watertown	MA72-36	Charles River	Pathogens
Wellesley	MA72-06	Charles River	Pathogens
Wellesley	MA72-07	Charles River	Pathogens
Wellesley	MA72-18	Fuller Brook	Pathogens

Wellesley	MA72-25	Rosemary Brook	Pathogens
Wellfleet	MA96-32	Duck Creek	Fecal Coliform
Wellfleet	MA96-33	Herring River	Fecal Coliform
Wellfleet	MA96-34	Wellfleet Harbor	Fecal Coliform
West Bridgewater	MA62-06	Salisbury Plain River	Escherichia Coli (E. Coli)
Weston	MA72-07	Charles River	Pathogens
Westport	MA95-37	West Branch Westport River	Fecal Coliform
Westport	MA95-40	East Branch Westport River	Escherichia Coli (E. Coli)
Westport	MA95-41	East Branch Westport River	Fecal Coliform
Westport	MA95-44	Snell Creek	Escherichia Coli (E. Coli)
Westport	MA95-45	Snell Creek	Escherichia Coli (E. Coli)
Westport	MA95-54	Westport River	Fecal Coliform
Westport	MA95-58	Bread And Cheese Brook	Escherichia Coli (E. Coli)
Westport	MA95-59	Snell Creek	Fecal Coliform
Westwood	MA72-21	Rock Meadow Brook	Pathogens
Westwood	MA73-02	Neponset River	Fecal Coliform
Westwood	MA73-15	Germany Brook	Fecal Coliform
Westwood	MA73-24	Purgatory Brook	Fecal Coliform
Westwood	MA73-25	Pecunit Brook	Escherichia Coli (E. Coli)
Westwood	MA73-27	Ponkapog Brook	Fecal Coliform
Whitman	MA62-09	Beaver Brook	Escherichia Coli (E. Coli)
Whitman	MA62-33	Shumatuscacant River	Escherichia Coli (E. Coli)
Whitman	MA62-38	Meadow Brook	Escherichia Coli (E. Coli)
Wilmington	MA83-18	Shawsheen River	Fecal Coliform
Winthrop	MA93-53	Lynn Harbor	Fecal Coliform
Yarmouth	MA96-12	Bass River	Fecal Coliform
Yarmouth	MA96-35	Chase Garden Creek	Fecal Coliform
Yarmouth	MA96-36	Lewis Bay	Fecal Coliform
Yarmouth	MA96-37	Mill Creek	Fecal Coliform
Yarmouth	MA96-38	Parkers River	Fecal Coliform
Yarmouth	MA96-80	Mill Creek	Fecal Coliform
Yarmouth	MA96-82	Hyannis Inner Harbor	Fecal Coliform

Table F-8: Bacteria or pathogens impaired waterbody names and segment IDs along with primary municipality and indicator organism identified by the applicable TMDL. The term primary municipality indicates the municipality in which the majority of the segment is located, but does not necessarily indicate each municipality that has regulated discharges to the waterbody segment.

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part A.III.1. as follows:
    a. The permittee is relieved of additional requirements as of the date when the following conditions are met:
        i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable to the receiving water

that indicates that no additional stormwater controls for bacteria/pathogens are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL

b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any additional remaining requirements of Appendix F part A.III.1 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 F part A.III.1 to date to reduce bacteria/pathogens in their 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 F part A.III.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

IV. Cape Cod Nitrogen TMDL Requirements

There are 19 approved TMDLs for nitrogen for various watersheds, ponds and bays on Cape Cod.[15] The following measuress are needed to ensure that current nitrogen loads from MS4 stormwater discharged into the impaired waterbodies do not increase.

1. The operators of traditional and non-traditional MS4s located in municipalities listed in Table F-9 or any other MS4 (traditional and non-traditional) that discharges to any waterbody listed in Table F-9 or their tributaries shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below:

    a. Enhanced BMPs

        i. Enhancement of BMPs required by part 2.3 of the permit that shall be implemented during this permit term:

            1. part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute an annual message in the spring (April/May) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute an annual message in the Fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The permittee shall deliver an annual message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of nitrogen to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP. All public education messages can be combined with requirements of Appendix H part I, II and III as well as Appendix F part A.III, A.V, B.I, B.II and B.III where appropriate.

            2. part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for nitrogen removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs to reduce nitrogen discharges.

[15] Final nitrogen TMDLs for Cape Cod can be found here: http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html

3. part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: establish requirements for use of slow release fertilizers on permittee owned property currently using fertilizer, in addition to reducing and managing fertilizer use as provided in in part 2.3.7.1; establish procedures to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; increased street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two (2) times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

Municipality	Waterbody Name
Barnstable	Centerville River
Barnstable	Popponesset Bay
Barnstable	Shoestring Bay
Barnstable	Cotuit Bay
Barnstable	North Bay
Barnstable	Prince Cove
Barnstable	West Bay
Barnstable	Hyannis Inner Harbor
Barnstable	Lewis Bay
Bourne	Phinneys Harbor
Chatham	Crows Pond
Chatham	Bucks Creek
Chatham	Harding Beach Pond
Chatham	Mill Creek
Chatham	Mill Pond
Chatham	Oyster Pond
Chatham	Oyster Pond River
Chatham	Stage Harbor
Chatham	Taylors Pond
Chatham	Frost Fish Creek
Chatham	Ryder Cove
Falmouth	Bournes Pond
Falmouth	Great Pond
Falmouth	Green Pond
Falmouth	Perch Pond
Falmouth	Little Pond
Falmouth	Oyster Pond
Falmouth	Quashnet River
Falmouth	Inner West Falmouth Harbor

Municipality	Waterbody Name
Falmouth	West Falmouth Harbor
Falmouth	Snug Harbor
Falmouth	Harbor Head
Harwich	Muddy Creek - Lower
Harwich	Muddy Creek - Upper
Harwich	Round Cove
Mashpee	Mashpee River
Mashpee	Great River
Mashpee	Hamblin Pond
Mashpee	Jehu Pond
Mashpee	Little River
Orleans	Areys Pond
Orleans	Little Pleasant Bay
Orleans	Namequoit River
Orleans	Paw Wah Pond
Orleans	Pleasant Bay
Orleans	Pochet Neck
Orleans	Quanset Pond
Yarmouth	Mill Creek
Yarmouth	Hyannis Inner Harbor
Yarmouth	Lewis Bay

Table F-9: Waterbodies subject to a Cape Cod nitrogen TMDL and the primary municipalities

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part A.IV.1. 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 applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of nitrogen are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
    b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part A.IV.1 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 F part A.IV.1 to date to reduce nitrogen in their 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 F part A.IV.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing

implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

V. Assabet River Phosphorus TMDL Requirements

On September 23, 2004 EPA approved the *Assabet River Total Maximum Daily Load for Total Phosphorus*[16]. The following measures are needed to ensure that current phosphorus loads from MS4 stormwater discharged directly or indirectly via tributaries into the Assabet River do not increase.

1. The operators of traditional and non-traditional MS4s located in municipalities listed in Table F-10 within the Assabet River Watershed shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below:

    a. Enhanced BMPs

        i. Enhancement of BMPs required by part 2.3 of the permit that shall be implemented during this permit term:

            1. part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute an annual message in the spring (March/April) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release and phosphorous-free fertilizers. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute an annual message in the fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The permittee shall deliver an annual message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of phosphorous to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP. All public education messages can be combined with requirements of Appendix H part I, II and III as well as Appendix F part A.III, A.IV, B.I, B.II and B.III where appropriate.

            2. part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for phosphorus removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs that infiltrate stormwater where feasible.

            3. part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: Establish program to properly

[16] Massachusetts Department of Environmental Protection, 2004. *Assabet River Total Maximum Daily Load for Total Phosphorus.* CN 201.0

manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; increased street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

Municipality
Acton
Berlin
Bolton
Boxborough
Boylston
Carlisle
Clinton
Concord
Grafton
Harvard
Hudson
Littleton
Marlborough
Maynard
Northborough
Shrewsbury
Stow
Westborough
Westford

Table F-10: Municipalities located in the Assabet River Watershed

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part A.V.1. as follows.
    a. The permittee is relieved of its additional requirements as of the date when following conditions are met:
        i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of phosphorus are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
    b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part A.V.1 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 F part A.V.1 to

date to reduce phosphorus in their 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 F part A.V.1 required to be implemented prior to the date of the newly approved TMDL including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

B. Requirements for Discharges to Impaired Waters with an Approved Out of State TMDL

I. Nitrogen TMDL Requirements

Discharges from MS4s in Massachusetts to waters that are tributaries to the Long Island Sound, which has an approved TMDL for nitrogen[17], are subject to the requirements of this part.

1. The operators of traditional and non-traditional MS4s located in municipalities listed in Table F-11 shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below:

    a. Enhanced BMPs

        i. Enhancement of BMPs required by part 2.3 of the permit that shall be implemented during this permit term:

            1. part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute an annual message in the spring (April/May) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute an annual message in the Fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The permittee shall deliver an annual message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of nitrogen to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP. All public education messages can be combined with requirements of Appendix H part I, II and III as well as Appendix F part A.III, A.IV, A.V, B.II and B.III where appropriate.

            2. part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for nitrogen removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs to reduce nitrogen discharges.

            3. part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: establish requirements for use of

[17] Connecticut Department of Environmental Protection. 2000. *A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound*

slow release fertilizers on permittee owned property currently using fertilizer, in addition to reducing and managing fertilizer use as provided in in part 2.3.7.1; establish procedures to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; increased street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two (2) times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

b. Nitrogen Source Identification Report

i. Within four years of the permit effective date the permittee shall complete a Nitrogen Source Identification Report. The report shall include the following elements:

1. Calculation of total urbanized area within the permittee's jurisdiction that is within the Connecticut River Watershed, the Housatonic River Watershed, or the Thames River Watershed, incorporating updated mapping of the MS4 and catchment delineations produced pursuant to part 2.3.4.6,
2. All screening and monitoring results pursuant to part 2.3.4.7.d., targeting the receiving water segment(s)
3. Impervious area and DCIA for the target catchment
4. Identification, delineation and prioritization of potential catchments with high nitrogen loading
5. Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during re-development

ii. The final Nitrogen Source Identification Report shall be submitted to EPA as part of the year 4 annual report.

c. Structural BMPs

i. Within five years of the permit effective date, the permittee shall evaluate all properties identified as presenting retrofit opportunities or areas for structural BMP installation under permit part 2.3.6.d.ii. or identified in the Nitrogen Source Identification Report. The evaluation shall include:

1. The next planned infrastructure, resurfacing or redevelopment activity planned for the property (if applicable) OR planned retrofit date;
2. The estimated cost of redevelopment or retrofit BMPs; and
3. The engineering and regulatory feasibility of redevelopment or retrofit BMPs.

ii. The permittee shall provide a listing of planned structural BMPs and a plan and schedule for implementation in the year 5 annual

report. The permittee shall plan and install a minimum of one structural BMP as a demonstration project within six years of the permit effective date. The demonstration project shall be installed targeting a catchment with high nitrogen load potential. The permittee shall install the remainder of the structural BMPs in accordance with the plan and schedule provided in the year 5 annual report.

iii. Any structural BMPs listed in Table 4-3 of Attachment 1 to Appendix H installed in the urbanized area by the permittee or its agents shall be tracked and the permittee shall estimate the nitrogen removal by the BMP consistent with Attachment 1 to Appendix H. The permittee shall document the BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated nitrogen removed in mass per year by the BMP in each annual report.

Adams	North Adams
Agawam	Northampton
Amherst	Oxford
Ashburnham	Palmer
Ashby	Paxton
Auburn	Pelham
Belchertown	Pittsfield
Charlton	Richmond
Cheshire	Russell
Chicopee	Rutland
Dalton	South Hadley
Douglas	Southampton
Dudley	Southbridge
East Longmeadow	Southwick
Easthampton	Spencer
Gardner	Springfield
Granby	Sturbridge
Hadley	Sutton
Hampden	Templeton
Hatfield	Ware
Hinsdale	Webster
Holyoke	West Springfield
Lanesborough	Westfield
Leicester	Westhampton
Lenox	Westminster
Longmeadow	Wilbraham
Ludlow	Williamsburg
Millbury	Winchendon

Monson	

Table F-11: Massachusetts municipalities in which MS4 discharges are within the Connecticut River Watershed, the Housatonic River Watershed, or the Thames River Watershed.

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part B.I.1. as follows:
    a. The permittee is relieved of its additional requirements as of the date when the following conditions are met:
        i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of nitrogen are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
    b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part B.I.1 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 F part B.I.1 to date to reduce nitrogen in their 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 F part B.I.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

II. Phosphorus TMDL Requirements

There are currently eight approved phosphorus TMDLs for certain waterbody segments in Rhode Island that identify urban stormwater discharges in Massachusetts as sources that are contributing phosphorus to the impaired segments. The TMDLs include the Kickemuit Reservoir, Upper Kikemuit River, Kickemuit River, Ten Mile River, Central Pond, Turner Reservoir, Lower Ten Mile River, and Omega Pond TMDLs[18]. Table F-12 lists municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing phosphorus to the impaired waterbody segments in Rhode Island, the impaired receiving water, and the approved TMDL name. Any permittee (traditional or non-traditional) that operates an MS4 in a municipality listed in Table F-12 and that discharges to a waterbody or tributary of a waterbody listed on Table F-12 is subject to the requirements of this part.

1. The operators of traditional and non-traditional MS4s located in municipalities listed in Table F-12 and that discharge to a waterbody or a tributary of a waterbody identified on Table F-12 shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below:

    a. Enhanced BMPs

        i. Enhancement of BMPs required by part 2.3 of the permit that shall be implemented during this permit term:

            1. part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute an annual message in the spring (March/April) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release and phosphorous-free fertilizers. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute an annual message in the fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The permittee shall deliver an annual message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of phosphorous to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP. All public education messages can be combined with requirements of Appendix H part I, II and III as well as Appendix F part A.III, A.IV, A.V, B.I, and B.III where appropriate.

            2. part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for

[18] See http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm for all RI TMDL documents. (retrieved 6/30/2014)

adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for phosphorus removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs that infiltrate stormwater where feasible.

3. part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: Establish program to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; increased street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

b. Phosphorus Source Identification Report

i. Within four years of the permit effective date the permittee shall complete a Phosphorus Source Identification Report. The report shall include the following elements:

1. Calculation of total urbanized area draining to the water quality limited receiving water segments or their tributaries, incorporating updated mapping of the MS4 and catchment delineations produced pursuant to part 2.3.4.6,
2. All screening and monitoring results pursuant to part 2.3.4.7.d., targeting the receiving water segment(s)
3. Impervious area and DCIA for the target catchment
4. Identification, delineation and prioritization of potential catchments with high phosphorus loading
5. Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during re development, including the removal of impervious area of permittee owned properties

ii. The phosphorus source identification report shall be submitted to EPA as part of the year 4 annual report.

c. Structural BMPs

i. Within five years of the permit effective date, the permittee shall evaluate all permittee owned properties identified as presenting retrofit opportunities or areas for structural BMP installation under permit part 2.3.6.d.ii or identified in the Phosphorus Source Identification Report that are within the drainage area of the water quality limited water or its tributaries. The evaluation shall include:

1. The next planned infrastructure, resurfacing or redevelopment activity planned for the property (if applicable) OR planned retrofit date;
2. The estimated cost of redevelopment or retrofit BMPs; and
3. The engineering and regulatory feasibility of redevelopment or retrofit BMPs.

ii. The permittee shall provide a listing of planned structural BMPs and a plan and schedule for implementation in the year 5 annual report. The permittee shall plan and install a minimum of one structural BMP as a demonstration project within the drainage area of the water quality limited water or its tributaries within six years of the permit effective date. The demonstration project shall be installed targeting a catchment with high phosphorus load potential. The permittee shall install the remainder of the structural BMPs in accordance with the plan and schedule provided in the year 5 annual report.

iii. Any structural BMPs installed in the urbanized area by the permittee or its agents shall be tracked and the permittee shall estimate the phosphorus removal by the BMP consistent with Attachment 3 to Appendix F. The permittee shall document the BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated phosphorus removed in mass per year by the BMP in each annual report.

Municipality	Receiving Water	TMDL Name
Attleboro	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Omega Pond and Turner Reservoir	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
North Attleborough	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Omega Pond and Turner Reservoir	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Plainville	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Omega Pond and Turner Reservoir	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Rehoboth	Upper Kikemuit River, Kickemuit River, Kickemuit Reservoir	Fecal Coliform and Total Phosphorus TMDLs:

Municipality	Receiving Water	TMDL Name
		Kickemuit Reservoir, Rhode Island (RI0007034L-01) Upper Kickemuit River (RI 0007034R-01) Kickemuit River (MA 61-08_2004)
Seekonk	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Omega Pond and Turner Reservoir	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Swansea	Upper Kikemuit River, Kickemuit River, Kickemuit Reservoir	Fecal Coliform and Total Phosphorus TMDLs: Kickemuit Reservoir, Rhode Island (RI0007034L-01) Upper Kickemuit River (RI 0007034R-01) Kickemuit River (MA 61-08_2004)

Table F-12: Municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing phosphorus to the impaired waterbody segments in Rhode Island, the impaired receiving water, and the approved TMDL name.

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part B.II.1. as follows:
    a. The permittee is relieved of its additional requirements as of the date when one of the following criteria are met:
        i. The applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of phosphorus are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
    b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part B.II.1 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 F part B.II.1 to date to reduce phosphorus in their 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 F part B.II.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

III. Bacteria and Pathogen TMDL Requirements

There are currently six approved bacteria (fecal coliform bacteria) or pathogen (fecal coliform and/or enterococcus bacteria) TMDLs for certain waterbody segments in Rhode Island that identify urban stormwater discharges in Massachusetts as sources that are contributing bacteria or pathogens to the impaired segments. The TMDLs include the Kickemuit Reservoir, Upper Kikemuit River, Ten Mile River, Lower Ten Mile River and Omega Pond TMDLs[19] Table F-13 lists municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing bacteria or pathogens to the impaired waterbody segments in Rhode Island,, the impaired receiving water, and the approved TMDL name. Any permittee (traditional or non-traditional) that operates an MS4 in a municipality listed in Table F-13 and that discharges to a waterbody or a tributary of a waterbody listed on Table F-13 is subject to the requirements of this part.

1) Traditional and non-traditional MS4s operating in the municipalities identified in Table F-13 and that discharge to a waterbody or a tributary of a waterbody identified on Table F-13 shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below::

    a. Enhanced BMPs

        i. Enhancement of BMPs required by part 2.3 of the permit that shall be implemented during this permit term:

            1. part 2.3.3. Public Education: 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, II and III as well as Appendix F part A.III, A.IV, A.V, B.I, and B.II where appropriate.

            2. part 2.3.4 Illicit Discharge: 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.

[19] See http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm for all RI TMDL documents. (retrieved 6/30/2014)

Municipality	Receiving Water	TMDL Name
Attleboro	Upper Ten Mile River, Lower Ten Mile River, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
North Attleborough	Upper Ten Mile River, Lower Ten Mile River, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Plainville	Upper Ten Mile River, Lower Ten Mile River, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Rehoboth	Upper Kikemuit River, Kickemuit Reservoir	Fecal Coliform and Total Phosphorus TMDLs: Kickemuit Reservoir, Rhode Island (RI0007034L-01) Upper Kickemuit River (RI 0007034R-01) Kickemuit River (MA 61-08_2004)
Seekonk	Upper Ten Mile River, Lower Ten Mile River, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed

Table F-13: Municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing bacteria or pathogens to the impaired waterbody segments in Rhode Island,, the impaired receiving water, and the approved TMDL name

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part B.III.1. 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 applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of bacteria/pathogens are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL
    b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part B.III.1 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 F part B.III.1 to date to reduce bacteria/pathogens in their 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 F part B.III.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation

of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

IV. Metals TMDL Requirements

There are currently five approved metals TMDL for a waterbody segment in Rhode Island that that identifies urban stormwater discharges in Massachusetts as sources that are contributing metals (Cadmium, Lead, Aluminum, Iron) to the impaired segment. The TMDLs include the Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir and Omega Pond TMDLs.[20] Table F-14 lists municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing metals to the impaired waterbody segments in Rhode Island, the impaired receiving water, the approved TMDL name, and the pollutant of concern. Any permittee (traditional or non-traditional) that operates an MS4 in a municipality listed in Table F-14 and the discharge is to a waterbody or tributary of a waterbody listed on Table F-14 is subject to the requirements of this part.

1) Traditional and non-traditional MS4s operating in the municipalities identified in Table F-14 and that discharge to a waterbody or a tributary of a waterbody identified on Table F-14 shall identify and implement BMPs designed to reduce metals discharges from its MS4. To address metals discharges, each permittee shall comply with the following BMPs in addition to the requirements of part 2.3 of the Permit, as described below:

    a. Enhanced BMPs

        i. 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:

            1. part 2.3.6, Stormwater Management in New Development and Redevelopment: stormwater management systems designed on commercial and industrial land use area draining to the water quality limited waterbody 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. EPA also encourages the permittee to require any stormwater management system designed to infiltrate stormwater on commercial or industrial sites to provide the level of pollutant removal equal to or greater than the level of pollutant removal provided through the use of biofiltration of the same volume of runoff to be infiltrated, prior to infiltration.

            2. part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: increased street sweeping frequency of all municipal owned streets and parking lots to a schedule determined by the permittee to target areas with potential for high pollutant loads. This may include, but is not limited to, increased street sweeping frequency in commercial areas and high density residential areas, or

[20] See http://www.dem.ri.gov/programs/benviron/water/quality/rest/reports.htm for all RI TMDL documents. (retrieved 6/30/2014)

drainage areas with a large amount of impervious area. Prioritize inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full. Clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings. Each annual report shall include the street sweeping schedule determined by the permittee to target high pollutant loads.

Municipality	Receiving Water	TMDL Name
Attleboro	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
North Attleborough	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Plainville	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed
Seekonk	Upper Ten Mile River, Lower Ten Mile River, Central Pond, Turner Reservoir, Omega Pond	Total Maximum Daily Load Analysis For The Ten Mile River Watershed

Table F-14: Municipalities in Massachusetts identified in the TMDLs as containing MS4s contributing metals to the impaired waterbody segments in Rhode Island, the impaired receiving water, the approved TMDL name, and the pollutant of concern.

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix F part B.IV.1. 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 applicable TMDL has been modified, revised or withdrawn and EPA has approved a new TMDL applicable for the receiving water that indicates that no additional stormwater controls for the control of metals (Cadmium, Lead, Aluminum, Iron) are necessary for the permittee's discharge based on wasteload allocations in the newly approved TMDL

b. In such a case, the permittee shall document the date of the approved TMDL in its SWMP and is relieved of any remaining requirements of Appendix F part B.IV.1 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 F part B.IV.1 to date to reduce metals (Cadmium, Lead, Aluminum, Iron) in their 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 F part B.IV.1 required to be implemented prior to the date of the newly approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

C. Requirements for Discharges to Impaired Waters with a Regional TMDL

I. The "Northeast Regional Mercury TMDL (2007)"

The Northeast Regional Mercury TMDL does not specify a wasteload allocation or other requirements either individually or categorically for the MS4 discharges and specifies that load reductions are to be achieved through reduction in atmospheric deposition sources. No requirements related to this TMDL are imposed on MS4 discharges under this part. However, if the permittee becomes aware, or EPA or MassDEP determines, that an MS4 discharge is causing or contributing to such impairment to an extent that cannot be explained by atmospheric deposition (e.g. chemical spill, acid landfill leachate or other sources), the permittee shall comply with the requirements of part 2.1.1.d and 2.3.4 of the permit.

ATTACHMENT 1 TO APPENDIX F

Method to Calculate Baseline Phosphorus Load (Baseline), Phosphorus Reduction Requirements and Phosphorus load increases due to development (P_{DEVinc})

The methods and annual phosphorus load export rates presented in Attachments 1, 2 and 3 are for the purpose of measuring load reductions for various stormwater BMPs treating runoff from different site conditions (i.e. impervious or pervious) and land uses (e.g. commercial, industrial, residential). The estimates of annual phosphorus load and load reductions due to BMPs are intended for use by the permittee to measure compliance with its Phosphorus Reduction Requirement under the permit.

This attachment provides the method to calculate a baseline phosphorus load discharging in stormwater for the impaired municipalities subject to Lakes and Ponds TMDL. A complete list of municipalities subject to these TMDLs is presented in Appendix F, Table F-6. This method shall be used to calculate the following annual phosphorus loads:

1) Baseline Phosphorus Load for Permittees
2) Phosphorus Reduction Requirement

This attachment also provides the method to calculate stormwater phosphorus load increases due to development for the municipalities subject to the Charles River TMDL requirements and the Lakes & Ponds TMDL requirements:

3) Phosphorus Load Increases due to Development

The **Baseline Phosphorus Load** is a measure of the annual phosphorus load discharging in stormwater from the impervious and pervious areas of the impaired Lake Phosphorus Control Plan (LPCP) Area.

The **Baseline Phosphorus Pounds Reduction** referred to as the permittee's **Phosphorus Reduction Requirement** represents the required reduction in annual phosphorus load in stormwater to meet the WLA for the impaired watershed. The percent phosphorus reduction for each watershed (identified in Appendix F, Table F-6) is applied to the Baseline Phosphorus Load to calculate the Phosphorus Pounds Reduction.

The **Phosphorus load increases due to development (P_{DEVinc})** is the stormwater phosphorus load increases due to development over the previous reporting period and incurred to date. Increases in stormwater phosphorus load from development will increase the permittee's baseline phosphorus load and therefore, the phosphorus reduction requirement.

Examples are provided to illustrate use of the methods. Table 1-1 below provides annual composite phosphorus load export rates (PLERs) by land use category for the Baseline Load and Phosphorus Reduction Requirement calculations. The permittee shall select the land use category that most closely represents the actual use of the watershed. For watersheds with institutional type uses, such as government properties, hospitals, and schools, the permittee shall use the commercial land use category for the purpose of calculating phosphorus loads. Table 1-2 provides annual PLERs by land use category for impervious and pervious areas. The permittee shall select the land use category that most closely represents the actual use of the watershed. For pervious areas, if the hydrologic soil group (HSG) is known, use the appropriate value. If the HSG is not known, assume HSG C conditions for the phosphorus load export rate. For watersheds with

institutional type uses, such as government properties, hospitals, and schools, the permittee shall use the commercial/industrial land use category for the purpose of calculating phosphorus loads. Table 1-3 provides a crosswalk table of land use codes between Tables 1-1 and 1-2 and the codes used by MassGIS.

The composite PLERs in Table 1-1 to be used for calculating Baseline Phosphorus Load are based on the specified directly connected impervious area (DCIA). If the permittee determines through mapping and site investigations that the overall DCIA for the collective area for each land use category is different than the corresponding values in Table 1-1, then the permittee is encouraged to submit this information in its annual report and request EPA to recalculate the composite PLERs for the permittees to use in refining the Baseline Phosphorus Load calculation for the LPCP.

(1) Baseline Phosphorus Load: The permittee shall calculate the **Baseline Phosphorus Load** by the following procedure:

1) Determine the total area (acre) associated with the impaired watershed;

2) Sort the total area associated with the watershed into land use categories;

3) Calculate the annual phosphorus load associated with each land use category by multiplying the total area of land use by the appropriate land use-based composite phosphorus load export rate provided in Table 1-1; and

4) Determine the Baseline Phosphorus Load by summing the land use loads.

Example 1-1 to determine Baseline Phosphorus Load:
Watershed A is 18.0 acres, with 11.0 acres of industrial area (e.g. access drives, buildings, and parking lots), 3.0 acres of medium-density residential and 4.0 acres of unmanaged wooded area.

The **Baseline Phosphorus Load** = (Baseline P Load $_{IND}$) + (Baseline P Load $_{MDR}$) + (Baseline P Load $_{FOR}$)

Where:
Baseline P Load $_{IND}$ = (TA_{IND}) x (PLER for industrial use (Table 1-1))
= 11.0 acre x 1.27 lbs/acre/year
= 14.0 lbs P/year

Baseline P Load $_{MDR}$ = (TA_{MDR}) x (PLER for medium density residential (Table 1-1))
= 3.0 acre x 0.49 lbs/acre/year
= 1.5 lbs P/year

Baseline P Load $_{FOR}$ = (TA_{FOR}) x (PLER for forest (Table 1-1))
= 4.0 acre x 0.12 lbs/acre/year
= 0.5 lbs P/year

Baseline Phosphorus Load = 14.0 lbs P/year + 1.5 lbs P/year + 0.5 lbs P/year
= **16.0 lbs P/year**

(2) Baseline Phosphorus Pounds Reduction (Phosphorus Reduction Requirement): The Baselines Phosphorus Reduction requirement is the amount of reduction in annual phosphorus load (in pounds) that the permittee is required to achieve in the Watershed. The permittee shall calculate the **Phosphorus Reduction Requirement** by multiplying the **Baseline Phosphorus Load** by the applicable percent phosphorus reduction for that watershed specified in Table F-6 (Appendix F).

Example 1-2 to determine Watershed Phosphorus Reduction Requirement:
Table F-6 identifies Watershed A's percent phosphorus reduction as 45%; therefore the Watershed Phosphorus Reduction Requirement is:

Phosphorus Reduction Requirement = (Baseline Phosphorus Load) x (0.45)
= (16.0 lbs P/year) x (0.45)
= **7.2 lbs P/year**

(3) Phosphorus load increases due to development (P_{DEVinc}): To estimate the increases in stormwater phosphorus load due to development in the Watershed (either PCP or LPCP Area), the permittee will use the following procedure:

1) Determine the total area of development by land use category and calculate the baseline load from that area using the composite PLERs in Table 1-1;

2) Distribute the total development area into impervious and pervious subareas by land use category;

3) Calculate the phosphorus load due to development (P_{DEV}) for each land use-based impervious and pervious subarea by multiplying the subarea by the appropriate phosphorus load export rate provided in Table 1-2; and

4) Determine the phosphorus load increase (P_{DEVinc}) by subtracting the baseline phosphorus load from the increased phosphorus load due to development.

Note: If structural BMPs are installed as part of new development, the P_{DEVinc} will be reduced by the amount of BMP load treated by that BMP as calculated in Attachment 3.

Example 1-3 to determine Phosphorus Load Increases: For the same 15.11 acre Watershed A as specified in Example 1-1, a permittee has tracked development in the LPCP Area in the last year that resulted in 1.5 acres of medium density residential area and 0.5 acres of forest land being converted to high density residential impervious area as detailed below. The undeveloped MDR area is pervious area, HSG C soil and the undeveloped forest area is pervious, HSG B soil.

Land Use Category	Baseline Area (acres)	P export rate (lbs P/acre/yr)*	Baseline area unchanged (acres)	P export rate (lbs P/acre/yr)**	Developed Area converted to HDR IA (acres)	P export rate (lbs P/acre/yr)**
Industrial	11.0	1.27	No change	--	No change	--
MDR	3.0	0.49	1.5	0.21	1.5	2.32

Forest	4.0	0.12	3.5	0.12	0.5	2.32

*From Table 1-1; ** From Table 1-2

The phosphorus load increase is calculated as:

Baseline Load = (Baseline P Load $_{IND}$) +
(Baseline P Load $_{MDR}$) +
(Baseline P Load $_{FOR}$)
= **16.0 lb/year** (determined in Example 1-1)

P_{DEV} = $(TA_{IND} \times PLER_{IND})+(IA_{HDR} \times PLER_{HDR})+(PA_{MDR} \times PLER_{MDR})+(PA_{FOR} \times PLER_{For})$
= (11.0 acres * 1.27) + (2.0 acres * 2.32) + (1.5 acres * 0.21) + (3.5 * 0.12)
= **19.0 lbs P/year**

$\mathbf{P_{DEVinc}}$ = P_{DEV} – Baseline Load
= 19.0 – 16.0
= **3.0 lbs/year**

Table 1-1. Annual composite phosphorus load export rates

Land Cover	Representative DCIA, %	Composite PLERs, lb/ac/yr	Composite PLERs, kg/ha/yr
Commercial	**57**	**1.13**	**1.27**
Industrial	**67**	**1.27**	**1.42**
High Density Residential	**36**	**1.04**	**1.16**
Medium Density Residential	**16**	**0.49**	**0.55**
Low Density Residential	**11**	**0.30**	**0.34**
Freeway	**44**	**0.73**	**0.82**
Open Space	**8**	**0.26**	**0.29**
Agriculture	**0.4**	**0.45**	**0.50**
Forest	**0.1**	**0.12**	**0.13**

Table 1-2: Proposed average annual distinct P Load export rates for use in estimating P Load reduction credits the MA MS4 Permit

Phosphorus Source Category by Land Use	Land Surface Cover	P Load Export Rate, lbs/acre/year	P Load Export Rate, kg/ha/yr
Commercial (Com) and Industrial (Ind)	Directly connected impervious	1.78	2.0
	Pervious	See* DevPERV	See* DevPERV
Multi-Family (MFR) and High-Density Residential (HDR)	Directly connected impervious	2.32	2.6
	Pervious	See* DevPERV	See* DevPERV
Medium -Density Residential (MDR)	Directly connected impervious	1.96	2.2
	Pervious	See* DevPERV	See* DevPERV
Low Density Residential (LDR) - "Rural"	Directly connected impervious	1.52	1.7
	Pervious	See* DevPERV	See* DevPERV
Highway (HWY)	Directly connected impervious	1.34	1.5
	Pervious	See* DevPERV	See* DevPERV
Forest (For)	Directly connected impervious	1.52	1.7
	Pervious	0.13	0.13
Open Land (Open)	Directly connected impervious	1.52	1.7
	Pervious	See* DevPERV	See* DevPERV
Agriculture (Ag)	Directly connected impervious	1.52	1.7
	Pervious	0.45	0.5
*Developed Land Pervious (DevPERV)- Hydrologic Soil Group A	Pervious	0.03	0.03
*Developed Land Pervious (DevPERV)- Hydrologic Soil Group B	Pervious	0.12	0.13
*Developed Land Pervious (DevPERV) - Hydrologic Soil Group C	Pervious	0.21	0.24
*Developed Land Pervious (DevPERV) - Hydrologic Soil Group C/D	Pervious	0.29	0.33
*Developed Land Pervious (DevPERV) - Hydrologic Soil Group D	Pervious	0.37	0.41

Table 1-3: Crosswalk of MassGIS land-use categories to land-use groups for P Load Calculations

Mass GIS Land Use LU_CODE	Description	Land Use group for calculating P Load - 2013/14 MA MS4
1	Crop Land	Agriculture
2	Pasture (active)	Agriculture
3	Forest	Forest
4	Wetland	Forest
5	Mining	Industrial
6	Open Land includes inactive pasture	open land
7	Participation Recreation	open land
8	spectator recreation	open land
9	Water Based Recreation	open land
10	Multi-Family Residential	High Density Residential
11	High Density Residential	High Density Residential
12	Medium Density Residential	Medium Density Residential
13	Low Density Residential	Low Density Residential
14	Saltwater Wetland	Water
15	Commercial	Commercial
16	Industrial	Industrial
17	Urban Open	open land
18	Transportation	Highway
19	Waste Disposal	Industrial
20	Water	Water
23	cranberry bog	Agriculture
24	Powerline	open land
25	Saltwater Sandy Beach	open land
26	Golf Course	Agriculture
29	Marina	Commercial
31	Urban Public	Commercial
34	Cemetery	open land
35	Orchard	Forest
36	Nursery	Agriculture
37	Forested Wetland	Forest
38	Very Low Density residential	Low Density Residential
39	Junkyards	Industrial
40	Brush land/Successional	Forest

ATTACHMENT 2 TO APPENDIX F

Phosphorus Reduction Credits for Selected Enhanced Non-Structural BMPs

The permittee shall use the following methods to calculate phosphorus load reduction credits for the following enhanced non-structural control practices implemented in the Watershed:

1) Enhanced Sweeping Program;
2) Catch Basin Cleaning;
   and
3) Organic Waste and Leaf Litter Collection program

The methods include the use of default phosphorus reduction factors that EPA has determined are acceptable for calculating phosphorus load reduction credits for these practices.

The methods and annual phosphorus load export rates presented in this attachment are for the purpose of counting load reductions for various BMPs treating storm water runoff from varying site conditions (i.e., impervious or pervious surfaces) and different land uses (e.g. industrial and commercial) within the impaired watershed. Table 2-1 below provides annual phosphorus load export rates by land use category for impervious and pervious areas. The estimates of annual phosphorus load and load reductions resulting from BMP implementation are intended for use by the permittee to measure compliance with its Phosphorus Reduction Requirement under the permit.

Examples are provided to illustrate use of the methods. In calculating phosphorus export rates, the permittee shall select the land use category that most closely represents the actual use for the area in question. For watersheds with institutional type uses, such as government properties, hospitals, and schools, the permittee shall use the commercial land use category for the purpose of calculating phosphorus loads. Table 2-2 provides a crosswalk table of land use codes between land use groups in Table 2-1 and the codes used by Mass GIS. For pervious areas, permittees should use the appropriate value for the hydrologic soil group (HSG) if known, otherwise, assume HSG C conditions.

Alternative Methods and/or Phosphorus Reduction Factors: A permittee may propose alternative methods and/or phosphorus reduction factors for calculating phosphorus load reduction credits for these non-structural practices. EPA will consider alternative methods and/or phosphorus reduction factors, provided that the permittee submits adequate supporting documentation to EPA. At a minimum, supporting documentation shall consist of a description of the proposed method, the technical basis of the method, identification of alternative phosphorus reduction factors, supporting calculations, and identification of references and sources of information that support the use of the alternative method and/or factors in the Watershed. If EPA determines that the alternative methods and/or factors are not adequately supported, EPA will notify the permittee and the permittee may receive no phosphorus reduction credit other than a reduction credit calculated by the permittee following the methods in this attachment for the identified practices.

Table 2-1: Proposed average annual distinct P Load export rates for use in estimating P Load reduction credits in the MA MS4 Permit

Phosphorus Source Category by Land Use	Land Surface Cover	P Load Export Rate, lbs/acre/year	P Load Export Rate, kg/ha/yr
Commercial (Com) and Industrial (Ind)	Directly connected impervious	1.78	2.0
	Pervious	See* DevPERV	See* DevPERV
Multi-Family (MFR) and High-Density Residential (HDR)	Directly connected impervious	2.32	2.6
	Pervious	See* DevPERV	See* DevPERV
Medium -Density Residential (MDR)	Directly connected impervious	1.96	2.2
	Pervious	See* DevPERV	See* DevPERV
Low Density Residential (LDR) - "Rural"	Directly connected impervious	1.52	1.7
	Pervious	See* DevPERV	See* DevPERV
Highway (HWY)	Directly connected impervious	1.34	1.5
	Pervious	See* DevPERV	See* DevPERV
Forest (For)	Directly connected impervious	1.52	1.7
	Pervious	0.13	0.13
Open Land (Open)	Directly connected impervious	1.52	1.7
	Pervious	See* DevPERV	See* DevPERV
Agriculture (Ag)	Directly connected impervious	1.52	1.7
	Pervious	0.45	0.5
*Developed Land Pervious (DevPERV) – HSG A	Pervious	0.03	0.03
*Developed Land Pervious (DevPERV) – HSG B	Pervious	0.12	0.13
*Developed Land Pervious (DevPERV) – HSG C	Pervious	0.21	0.24
*Developed Land Pervious (DevPERV) – HSG C/D	Pervious	0.29	0.33
*Developed Land Pervious (DevPERV) – HSG D	Pervious	0.37	0.41

Notes:

- For pervious areas, if the hydrologic soil group (HSG) is known, use the appropriate value from this table. If the HSG is not known, assume HSG C conditions for the phosphorus load export rate.
- Agriculture includes row crops. Actively managed hay fields and pasture lands. Institutional land uses such as government properties, hospitals and schools are to be included in the commercial and industrial land use grouping for the purpose of calculating phosphorus loading.
- Impervious surfaces within the forest land use category are typically roadways adjacent to forested pervious areas.

Table 2-2: Crosswalk of Mass GIS land use categories to land use groups for P load calculations

Mass GIS Land Use LU_CODE	Description	Land Use group for calculating P Load - 2013/14 MA MS4
1	Crop Land	Agriculture
2	Pasture (active)	Agriculture
3	Forest	Forest
4	Wetland	Forest
5	Mining	Industrial
6	Open Land includes inactive pasture	open land
7	Participation Recreation	open land
8	spectator recreation	open land
9	Water Based Recreation	open land
10	Multi-Family Residential	High Density Residential
11	High Density Residential	High Density Residential
12	Medium Density Residential	Medium Density Residential
13	Low Density Residential	Low Density Residential
14	Saltwater Wetland	Water
15	Commercial	Commercial
16	Industrial	Industrial
17	Urban Open	open land
18	Transportation	Highway
19	Waste Disposal	Industrial
20	Water	Water
23	cranberry bog	Agriculture
24	Powerline	open land
25	Saltwater Sandy Beach	open land
26	Golf Course	Agriculture
29	Marina	Commercial
31	Urban Public	Commercial
34	Cemetery	open land
35	Orchard	Forest
36	Nursery	Agriculture
37	Forested Wetland	Forest
38	Very Low Density residential	Low Density Residential
39	Junkyards	Industrial
40	Brush land/Successional	Forest

(1) Enhanced Sweeping Program: The permittee may earn a phosphorus reduction credit for conducting an enhanced sweeping program of impervious surfaces. Table 2-2 below outlines the default phosphorus removal factors for enhanced sweeping programs. The credit shall be calculated by using the following equation:

$$Credit_{sweeping} = IA_{swept} \times PLE_{IC\text{-}land\ use} \times PRF_{sweeping} \times AF \qquad \textbf{(Equation 2-1)}$$

Where:

$Credit_{sweeping}$ = Amount of phosphorus load removed by enhanced sweeping program (lb/year)

IA_{swept} = Area of impervious surface that is swept under the enhanced sweeping program (acres)

$PLE_{IC\text{-}land\ use}$ = Phosphorus Load Export Rate for impervious cover and specified land use (lb/acre/yr) (see Table 2-1)

$PRF_{sweeping}$ = Phosphorus Reduction Factor for sweeping based on sweeper type and frequency (see Table 2-3).

AF = Annual Frequency of sweeping. For example, if sweeping does not occur in Dec/Jan/Feb, the AF would be 9 mo./12 mo. = 0.75. For year-round sweeping, AF=1.0[1]

As an alternative, the permittee may apply a credible sweeping model of the Watershed and perform continuous simulations reflecting build-up and wash-off of phosphorus using long-term local rainfall data.

Table 2-3: Phosphorus reduction efficiency factors ($PRF_{sweeping}$) for sweeping impervious areas

Frequency[1]	Sweeper Technology	$PRF_{sweeping}$
2/year (spring and fall)[2]	Mechanical Broom	0.01
2/year (spring and fall)[2]	Vacuum Assisted	0.02
2/year (spring and fall)[2]	High-Efficiency Regenerative Air-Vacuum	0.02
Monthly	Mechanical Broom	0.03
Monthly	Vacuum Assisted	0.04
Monthly	High Efficiency Regenerative Air-Vacuum	0.08
Weekly	Mechanical Broom	0.05
Weekly	Vacuum Assisted	0.08
Weekly	High Efficiency Regenerative Air-Vacuum	0.10

[1]For full credit for monthly and weekly frequency, sweeping must be conducted year round. Otherwise, the credit should be adjusted proportionally based on the duration of the sweeping season (using AF factor).

[2] In order to earn credit for semi-annual sweeping the sweeping must occur in the spring following snow-melt and road sand applications to impervious surfaces and in the fall after leaf-fall and prior to the onset to the snow season.

Example 2-1: Calculation of enhanced sweeping program credit (Credit $_{sweeping}$): A permittee proposes to implement an enhanced sweeping program and perform weekly sweeping from March 1 – December 1 (9 months) in their Watershed, using a vacuum assisted sweeper on 20.3 acres of parking lots and roadways in a high-density residential area of the Watershed. For this site the needed information is:

IA_{swept}	= 20.3 acres
$PLE_{IC\text{-}HDR}$	= 2.32 lb/acre/yr (from Table 2-1)
$PRF_{sweeping}$	= 0.08 (from Table 2-3)
AF	= (9 months / 12 months) = 0.75

Substitution into equation 2-1 yields a $Credit_{sweeping}$ of 3.2 pounds of phosphorus removed per year.

$Credit_{sweeping}$ = IA_{swept} x $PLE_{land\ use}$ x $PRF_{sweeping}$ x AF
= 20.3 acres x 2.32 lbs/acre/yr x 0.08 x 0.75
= 2.8 lbs/yr

(2) Catch Basin Cleaning: The permittee may earn a phosphorus reduction credit, $Credit_{CB}$, by removing accumulated materials from catch basins (i.e., catch basin cleaning) in the Watershed such that a minimum sump storage capacity of 50% is maintained throughout the year. The credit shall be calculated by using the following equation:

$$Credit_{CB} = IA_{CB} \times PLE_{IC\text{-}land\ use} \times PRF_{CB} \quad \textbf{(Equation 2-2)}$$

Where:

$Credit_{CB}$	=	Amount of phosphorus load removed by catch basin cleaning (lb/year)
IA_{CB}	=	Impervious drainage area to catch basins (acres)
$PLE_{IC\text{-}and\ use}$	=	Phosphorus Load Export Rate for impervious cover and specified land use (lb/acre/yr) (see Table 2-1)
PRF_{CB}	=	Phosphorus Reduction Factor for catch basin cleaning (see Table 2-4)

Table 2-4: Phosphorus reduction efficiency factor (PRF_{CB}) for semi-annual catch basin cleaning

Frequency	Practice	PRF_{CB}
Semi-annual	Catch Basin Cleaning	0.02

Example 2-2: Calculation for catch basin cleaning credit (Credit $_{CB}$):
A permittee proposes to clean catch basins in their Watershed (i.e., remove accumulated sediments and contaminants captured in the catch basins) that drain runoff from 15.3 acres of medium-density residential impervious area. For this site the needed information is:

IA_{CB}	= 15.3 acre
$PLE_{IC\text{-}MDR}$	= 1.96 lbs/acre/yr (from Table 2-1)
PRF_{CB}	= 0.02 (from Table 2-4)

Substitution into equation 2-2 yields a Credit $_{CB}$ of 0.6 pounds of phosphorus removed per year:

Credit $_{CB}$	= IA_{CB} x $PLE_{IC\text{-}MDR}$ x PRF_{CB}
	= 15.3 acre x 1.96 lbs/acre/yr x 0.02
	= 0.6 lbs/yr

(3) Enhanced Organic Waste and Leaf Litter Collection program: The permittee may earn a phosphorus reduction credit by performing regular gathering, removal and disposal of landscaping wastes, organic debris, and leaf litter from impervious surfaces from which runoff discharges to the TMDL waterbody or its tributaries. In order to earn this credit (Credit $_{leaf\ litter}$), the permittee must gather and remove all landscaping wastes, organic debris, and leaf litter from impervious roadways and parking lots at least once per week during the period of September 1 to December 1 of each year. Credit can only be earned for those impervious surfaces that are cleared of organic materials in accordance with the description above. The gathering and removal shall occur immediately following any landscaping activities in the Watershed and at additional times when necessary to achieve a weekly cleaning frequency. The permittee must ensure that the disposal of these materials will not contribute pollutants to any surface water discharges. The permittee may use an enhanced sweeping program (e.g., weekly frequency) as part of earning this credit provided that the sweeping is effective at removing leaf litter and organic materials. The Credit $_{leaf\ litter}$ shall be determined by the following equation:

$$Credit_{leaf\ litter} = (Watershed\ Area) \times (PLE_{IC\text{-}land\ use}) \times (0.05) \qquad \textbf{(Equation 2-3)}$$

Where:

Credit $_{leaf\ litter}$	= Amount of phosphorus load reduction credit for organic waste and leaf litter collection program (lb/year)
Watershed Area	= All impervious area (acre) from which runoff discharges to the TMDL waterbody or its tributaries in the Watershed
$PLE_{IC\text{-}land\ use}$	= Phosphorus Load Export Rate for impervious cover and specified land use (lbs/acre/yr) (see Table 2-1)
0.05	= 5% phosphorus reduction factor for organic waste and leaf litter collection program in the Watershed

Example 2-3: Calculation for organic waste and leaf litter collection program credit (Credit $_{\text{leaf litter}}$): A permittee proposes to implement an organic waste and leaf litter collection program by sweeping the parking lots and access drives at a minimum of once per week using a mechanical broom sweeper for the period of September 1 to December 1 over 12.5 acres of impervious roadways and parking lots in an industrial/commercial area of the Watershed. Also, the permittee will ensure that organic materials are removed from impervious areas immediately following all landscaping activities at the site. For this site the needed information to calculate the Credit $_{\text{leaf litter}}$ is:

Watershed Area = 12.5 acres; and
PLE $_{\text{IC-commercial}}$ = 1.78 lbs/acre/yr (from Table 2-1)

Substitution into equation 2-4 yields a Credit $_{\text{leaf litter}}$ of 1.1 pounds of phosphorus removed per year:

Credit $_{\text{leaf litter}}$ = (12.5 acre) x (1.78 lbs/acre/yr) x (0.05)
= 1.1 lbs/yr

The permittee also may earn a phosphorus reduction credit for enhanced sweeping of roads and parking lot areas (i.e., Credit $_{\text{sweeping}}$) for the three months of use. Using equation 2-1, Credit $_{\text{sweeping}}$ is:

Credit $_{\text{sweeping}}$ = IA $_{\text{swept}}$ x PLE $_{\text{IC-land use}}$ x PRF $_{\text{sweeping}}$ x AF **(Equation 2-1)**
IA $_{\text{swept}}$ = 12.5 acre
PLE $_{\text{IC-commercial}}$ = 1.78 lbs/acre/yr (from Table 2-1)
PRF $_{\text{sweeping}}$ = 0.05 (from Table 2-3)
AF = 3 mo./12 mo. = 0.25

Substitution into equation 2-1 yields a Credit $_{\text{sweeping}}$ of 0.28 pounds of phosphorus removed per year.

Credit $_{\text{sweeping}}$ = IA $_{\text{swept}}$ x PLE $_{\text{IC-commercial}}$ x PRF $_{\text{sweeping}}$ x AF
= 12.5 acre x 1.78 lbs/acre/yr x 0.05 x 0.25
= 0.3 lbs/yr

ATTACHMENT 3 TO APPENDIX F

Methods to Calculate Phosphorus Load Reductions for Structural Stormwater Best Management Practices

List of Tables:

List of Figures:

Methods to Calculate Phosphorus Load Reductions for Structural Stormwater Best Management Practices in the Watershed

This attachment provides methods to determine design storage volume capacities and to calculate phosphorus load reductions for the following structural Best Management Practices (structural BMPs) for a Watershed:

1) Infiltration Trench;
2) Infiltration Basin or other surface infiltration practice;
3) Bio-filtration Practice;
4) Gravel Wetland System;
5) Porous Pavement;
6) Wet Pond or wet detention basin;
7) Dry Pond or detention basin; and
8) Dry Water Quality Swale/ Grass Swale.

Additionally, this attachment provides methods to design and quantify associated phosphorus load reduction credits for the following four types of semi-structural/non-structural BMPs

9) Impervious Area Disconnection through Storage (e.g., rain barrels, cisterns, etc);
10) Impervious Area Disconnection;
11) Conversions of Impervious Area to Permeable Pervious Area; and
12) Soil Amendments to Enhance Permeability of Pervious Areas.

Methods and examples are provided in this Attachment to calculate phosphorus load reductions for structural BMPs for the four following purposes:

1) To determine the design volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area is 100% impervious;
2) To determine the phosphorus load reduction for a structural BMP with a known design volume when the contributing drainage area is 100% impervious;
3) To determine the design volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area has impervious and pervious surfaces; and
4) To determine the phosphorus load reduction for a structural BMP with a known design volume when the contributing drainage area has impervious and pervious surfaces.

Examples are also provided for estimating phosphorus load reductions associated with the four semi-structural/non-structural BMPs.

Also, this attachment provides the methodology for calculating the annual stormwater phosphorus load that will be delivered to BMPs for treatment (BMP Load) and to be used for quantifying phosphorus load reduction credits. The methods and annual phosphorus export load rates presented in this attachment are for the purpose of counting load reductions for various BMPs treating storm water runoff from varying site conditions (i.e., impervious or pervious surfaces) and different land uses (e.g. commercial and industrial). The estimates of annual phosphorus load and load reductions by BMPs are to demonstrate compliance with the permittee's Phosphorus Reduction Requirement under the permit.

Structural BMP performance credits: For each structural BMP type identified above (BMPs 1-8), long-term cumulative performance information is provided to calculate phosphorus load reductions or to determine needed design storage volumes to achieve a specified reduction target (e.g., 65% phosphorus load reduction). The performance information is expressed as cumulative phosphorus load removed (% removed) depending on the physical storage capacity of the structural BMP (expressed as inches of runoff from impervious area) and is provided at the end of this Attachment (see Tables 3-1 through 3-18 and performance curves Figures 3-1 through 3-17). Multiple tables and performance curves are provided for the infiltration practices to represent cumulative phosphorus load reduction performance for six infiltration rates (IR), 0.17, 0.27, 0.53, 1.02, 2.41, and 8.27 inches/hour. These infiltration rates represent the saturated hydraulic conductivity of the soils. The permittee may use the performance curves provided in this attachment to interpolate phosphorus load removal reductions for field measured infiltration rates that are different than the infiltration rates used to develop the performance curves. Otherwise, the permittee shall use the performance curve for the IR that is nearest, but less than, the field measured rate. Physical storage capacity equals the total physical storage volume of the control structure to contain water at any instant in time. Typically, this storage capacity is comprised of the surface ponding storage volume prior to overflow and subsurface storage volumes in storage units and pore spaces of coarse filter media. Table 3-30 provides the formulae to calculate physical storage capacities for the structural control types for using the performance curves.

Semi-Structural/Non-structural BMP performance credits: For each semi-structural/non-structural BMP type identified above (BMPs 9-12), long-term cumulative performance information is provided to calculate phosphorus load reductions or to determine needed design specifications to achieve a desired reduction target (e.g., 50% phosphorus load reduction). The performance information is expressed as cumulative runoff volume reduction (% removed) depending on the design specifics and actual field conditions. Cumulative percent runoff volume reduction is being used to estimate the cumulative phosphorus load reduction credit for these BMPs. To represent a wide range of potential conditions for implementing these types of BMPs, numerous performance tables and curves have been developed to reflect a wide range of potential conditions and designs such as varying storage volumes (expressed in terms of varying ratios of storage volume to impervious area (0.1 to 2.0 inches)); varying ratios of impervious source area to receiving pervious area based on hydrologic soil groups (HSGs) A, B, C and D (8:1, 6:1, 4:1, 2: 1 and 1:1); and varying discharge time periods for temporary storage (1, 2 or 3 days) . The default credits are provided at the end of this Attachment (see Tables 3-19 through 3-26 and performance curves Figures 3-18 through 3-38).

EPA will consider phosphorus load reductions calculated using the methods provided below to be valid for the purpose of complying with the terms of this permit for BMPs that have not been explicitly modeled if the desired BMP has functionality that is similar to one of the simulated BMP types. Please note that only the surface infiltration and the infiltration trench BMP types were simulated to direct storm water runoff into the ground (i.e., infiltration). All of the other simulated BMPs represent practices that have either under-drains or impermeable liners and therefore, are not hydraulically connected to the sub-surface soils (i.e., no infiltration). Following are some simple guidelines for selecting the BMP type and/or determining whether the results of any of the BMP types provided are appropriate for another BMP of interest.

Infiltration Trench is a practice that provides temporary storage of runoff using the void spaces within the soil/sand/gravel mixture that is used to backfill the trench for subsequent infiltration into the surrounding sub-soils. Performance results for the infiltration trench can be used for all subsurface infiltration practices including systems that include pipes and/or chambers that provide temporary storage. Also, the results for this BMP type can be used for bio-retention systems that rely on infiltration when the majority of the temporary storage capacity is provided in the void spaces of the soil filter media and porous pavements that allow infiltration to occur.

Surface Infiltration represents a practice that provides temporary surface storage of runoff (e.g., ponding) for subsequent infiltration into the ground. Appropriate practices for use of the surface infiltration performance estimates include infiltration basins, infiltration swales, rain gardens and bio-retention systems that rely on infiltration and provide the majority of storage capacity through surface-ponding. If an infiltration system includes both surface storage through ponding and a lessor storage volume within the void spaces of a coarse filter media, then the physical storage volume capacity used to determine the long-term cumulative phosphorus removal efficiency from the infiltration basin performance curves would be equal to the sum of the surface storage volume and the void space storage volume. General design specifications for various surface infiltration systems are provided in the most recent version of *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf).

Bio-filtration is a practice that provides temporary storage of runoff for filtering through an engineered soil media. The storage capacity is typically made of void spaces in the filter media and temporary ponding at the surface of the practice. Once the runoff has passed through the filter media it is collected by an under-drain pipe for discharge. The performance curve for this control practice assumes zero infiltration. If a filtration system has subsurface soils that are suitable for infiltration, then user should use the either performance curves for the infiltration trench or the infiltration basin depending on the predominance of storage volume made up by free standing storage or void space storage. Depending on the design of the filter media manufactured or packaged bio-filter systems such as tree box filters may be suitable for using the bio-filtration performance results. Design specifications for bio-filtration systems are provided in the most recent version of *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf).

Gravel Wetland performance results should be used for practices that have been designed in accordance or share similar features with the design specifications for gravel wetland systems provided in the most recent version of *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf).

Porous Pavement performance results represent systems with an impermeable under-liner and an under-drain. *If porous pavement systems do not have an impermeable under-liner so that filtered runoff can infiltrate into sub-soils then the performance results for an infiltration trench may be used for these systems.* Design specifications for porous pavement systems are provided in the most recent version of *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf).

Extended Dry Detention Pond performance results should only be used for practices that have been designed in accordance with the design specifications for extended dry detention ponds provided in the most recent version of *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf)

Dry Water Quality Swale/ Grass Swale performance results should only be used for practices that have been designed in accordance with the design specifications for a water quality dry swale provided in the most recent version of *the Massachusetts Stormwater Handbook, Volume 2/Chapter2* (http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/v2c2.pdf)

Impervious Area Disconnection using Storage (e.g., rain barrels, cistern, etc) performance results are for collecting runoff volumes from impervious areas such as roof tops, providing temporary storage of runoff volume using rain barrels, cisterns or other storage containers, and discharging stored volume to adjacent permeable pervious surfaces over an extended period of time.

Impervious Area Disconnection performance results are for diverting runoff volumes from impervious areas such as roadways, parking lots and roof tops, and discharging it to adjacent vegetated permeable surfaces that are of sufficient size with adequate soils to receive the runoff without causing negative impacts to adjacent down-gradient properties. Careful consideration must be given to the ratio of impervious area to the pervious area that will receive the discharge. Also, devices such as level spreaders to disperse the discharge and provide sheet flow should be employed whenever needed to increase recharge and avoid flow concentration and short circuiting through the pervious area. Soil testing is needed to classify the permeability of the receiving pervious area in terms of HSG.

Conversion of Impervious Area to Permeable Pervious Area phosphorus load reduction credits are for replacing existing impervious surfaces (such as traditional pavements and buildings with roof tops) with permeable surfaces. To be eligible for credit, it is essential that the area previously covered with impervious surface be restored to provide natural or enhanced hydrologic functioning so that the surface is permeable. Sub-soils beneath pavements are typically highly compacted and will require reworking to loosen the soil and the possible addition of soil amendments to restore permeability. Soil testing is needed to classify the permeability (in terms of HSG) of the restored pervious area.

Soil Amendments to Increase Permeability of Pervious Areas performance results are for the practice of improving the permeability of pervious areas through incorporation of soil amendments, tilling and establishing dense vegetation. This practice may be used to compliment other practices such as impervious area disconnection to improve overall performance and increase reduction credits earned. Soil testing is needed to classify the permeability (in terms of HSG) of the restored pervious area.

Alternative Methods:

A permittee may propose alternative long-term cumulative performance information or alternative methods to calculate phosphorus load reductions for the structural BMPs identified above or for other structural BMPs not identified in this Attachment.

EPA will consider alternative long-term cumulative performance information and alternative methods to calculate phosphorus load reductions for structural BMPs provided that the permittee provides EPA with adequate supporting documentation. At a minimum, the supporting documentation shall include:

1) Results of continuous BMP model simulations representing the structural BMP, using a verified BMP model and representative long-term (i.e., 10 years) climatic data including hourly rainfall data;
2) Supporting calculations and model documentation that justify use of the model, model input parameters, and the resulting cumulative phosphorus load reduction estimate;
3) If pollutant removal performance data are available for the specific BMP, model calibration results should be provided; and
4) Identification of references and sources of information that support the use of the alternative information and method.

If EPA determines that the long-term cumulative phosphorus load reductions developed based on alternative information are not adequately supported, EPA will notify the permittee in writing, and the permittee may receive no phosphorus reduction credit other than a reduction credit calculated by the permittee using the default phosphorus reduction factors provided in this attachment for the identified practices. The permittee is required to submit to EPA valid phosphorus load reductions for structural BMPs in the watershed in accordance with the submission schedule requirements specified in the permit and Appendix F.

Method to Calculate Annual Phosphorus Load Delivered to BMPs (BMP Load)

The **BMP Load** is the annual phosphorus load from the drainage area to each proposed or existing BMP used by permittee to claim credit against its stormwater phosphorus load reduction requirement (i.e., Phosphorus Reduction Requirement). The BMP Load is the starting point from which the permittee calculates the reduction in phosphorus load achieved by each existing and proposed BMP.

Examples are provided to illustrate use of the methods. Table 3-1 below provides annual phosphorus load export rates (PLERs) by land use category for impervious and pervious areas. The permittee shall select the land use category that most closely represents the actual use of the watershed. For pervious areas, if the hydrologic soil group (HSG) is known, use the appropriate value. If the HSG is not known, assume HSG C conditions for the phosphorus load export rate. For watersheds with institutional type uses, such as government properties, hospitals, and schools, the permittee shall use the commercial/industrial land use category for the purpose of calculating phosphorus loads. Table 3-2 provides a crosswalk table of land use codes between land use groups in Table 3-1 and the codes used by MassGIS.

BMP Load: To estimate the annual phosphorus load reduction that a storm water BMP can achieve, it is first necessary to estimate the amount of annual phosphorus load that the BMP will receive or treat (BMP Load).
For a given BMP:

1) Determine the total drainage area to the BMP;

2) Distribute the total drainage area into impervious and pervious subareas by land use category as defined by Tables 3-1 and 3-2;

3) Calculate the phosphorus load for each land use-based impervious and pervious subarea by multiplying the subarea by the appropriate phosphorus load export rate provided in Table 3-1; and

4) Determine the total annual phosphorus load to the BMP by summing the calculated impervious and pervious subarea phosphorus loads.

Example 3-1 to determine phosphorus load to a proposed BMP: A permittee is proposing a surface stormwater infiltration system that will treat runoff from an industrial site with an area of 12.87 acres (5.21 hectares) and is made up of 10.13 acres of impervious cover (e.g., roadways, parking areas and rooftops), 1.85 acres of landscaped pervious area and 0.89 acres of wooded area both with HSG C soils. The drainage area information for the proposed BMP is:

BMP Subarea ID	Land Use Category	Cover Type	Area (acres)	P export rate (lb/acre/yr)*
1	Industrial	impervious	10.13	1.78
2	Landscaped (HSG C)	pervious	1.85	0.21
3	Forest (HSG C)	pervious	0.89	0.12

*From Table 3-1

The phosphorus load to the proposed BMP (BMP Load) is calculated as:

BMP Load $= (IA_{Ind} \times PLER_{Ind}) + (PA_{Ind} \times PLER_{Ind}) + (PA_{FOREST} \times PLER_{For})$
$= (10.13 \times 1.78) + (1.85 \times 0.21) + (0.89 \times 0.12)$
= 18.53 lbs P/year

Table 3-1: Average annual distinct phosphorus load (P Load) export rates for use in estimating phosphorus load reduction credits the MA MS4 Permit

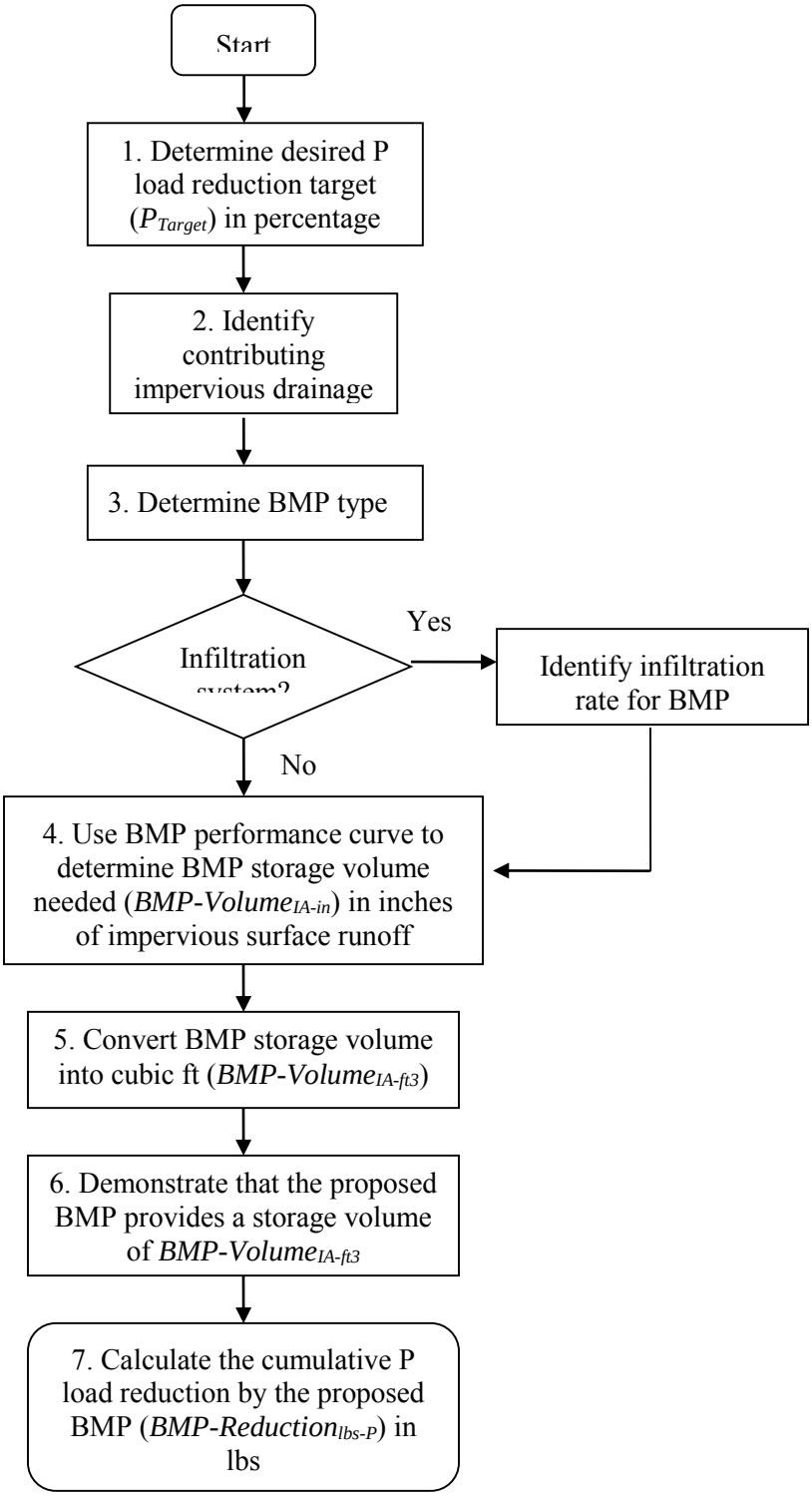
Phosphorus Source Category by Land Use	Land Surface Cover	P Load Export Rate, lbs/acre/year	P Load Export Rate, kg/ha/yr
Commercial (Com) and Industrial (Ind)	Directly connected impervious	1.78	2.0
	Pervious	See* DevPERV	See* DevPERV
Multi-Family (MFR) and High-Density Residential (HDR)	Directly connected impervious	2.32	2.6
	Pervious	See* DevPERV	See* DevPERV
Medium -Density Residential (MDR)	Directly connected impervious	1.96	2.2
	Pervious	See* DevPERV	See* DevPERV
Low Density Residential (LDR) - "Rural"	Directly connected impervious	1.52	1.7
	Pervious	See* DevPERV	See* DevPERV
Highway (HWY)	Directly connected impervious	1.34	1.5
	Pervious	See* DevPERV	See* DevPERV
Forest (For)	Directly connected impervious	1.52	1.7
	Pervious	0.13	0.13
Open Land (Open)	Directly connected impervious	1.52	1.7
	Pervious	See* DevPERV	See* DevPERV
Agriculture (Ag)	Directly connected impervious	1.52	1.7
	Pervious	0.45	0.5
*Developed Land Pervious (DevPERV)- Hydrologic Soil Group A	Pervious	0.03	0.03
*Developed Land Pervious (DevPERV)- Hydrologic Soil Group B	Pervious	0.12	0.13
*Developed Land Pervious (DevPERV) - Hydrologic Soil Group C	Pervious	0.21	0.24
*Developed Land Pervious (DevPERV) - Hydrologic Soil Group C/D	Pervious	0.29	0.33
*Developed Land Pervious (DevPERV) - Hydrologic Soil Group D	Pervious	0.37	0.41

Table 3- 2: MassGIS land-use categories with associated land-use groups for phosphorus load calculations

Mass GIS Land Use LU_CODE	Description	Land Use group for calculating P Load - 2013/14 MA MS4
1	Crop Land	Agriculture
2	Pasture (active)	Agriculture
3	Forest	Forest
4	Wetland	Forest
5	Mining	Industrial
6	Open Land includes inactive pasture	open land
7	Participation Recreation	open land
8	spectator recreation	open land
9	Water Based Recreation	open land
10	Multi-Family Residential	High Density Residential
11	High Density Residential	High Density Residential
12	Medium Density Residential	Medium Density Residential
13	Low Density Residential	Low Density Residential
14	Saltwater Wetland	Water
15	Commercial	Commercial
16	Industrial	Industrial
17	Urban Open	open land
18	Transportation	Highway
19	Waste Disposal	Industrial
20	Water	Water
23	cranberry bog	Agriculture
24	Powerline	open land
25	Saltwater Sandy Beach	open land
26	Golf Course	Agriculture
29	Marina	Commercial
31	Urban Public	Commercial
34	Cemetery	open land
35	Orchard	Forest
36	Nursery	Agriculture
37	Forested Wetland	Forest
38	Very Low Density residential	Low Density Residential
39	Junkyards	Industrial
40	Brush land/Successional	Forest

(1) Method to determine the design volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area is 100% impervious:

Flow Chart 1 illustrates the steps to determine the design volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area is 100% impervious.



Flow Chart 1: Method to determine BMP design volume to achieve a known phosphorous load reduction when contributing drainage area is 100% impervious.

1) Determine the desired cumulative phosphorus load reduction target (P_{target}) in percentage for the structural BMP;

2) Determine the contributing impervious drainage area (IA) in acres to the structural BMP;

3) Determine the structural BMP type (e.g., infiltration trench, gravel wetland). For infiltration systems, determine the appropriate infiltration rate for the location of the BMP in the Watershed;

4) Using the cumulative phosphorus removal performance curve for the selected structural BMP (Figures 3-1 through 3-18), determine the storage volume for the BMP (BMP-Volume $_{IA\text{-}in}$), in inches of runoff, needed to treat runoff from the contributing IA to achieve the reduction target;

5) Calculate the corresponding BMP storage volume in cubic feet (BMP-Volume $_{IA\text{-}ft^3}$) using BMP-Volume $_{IA\text{-}in}$ determined from step 4 and equation 3-1:

BMP-Volume $_{IA\text{-}ft^3}$ = IA (acre) x BMP-Volume $_{IA\text{-}in}$ x 3630 ft^3/ac-in **(Equation 3-1)**

6) Provide supporting calculations using the dimensions and specifications of the proposed structural BMP showing that the necessary storage volume, BMP-Volume $_{IA\text{-}ft^3}$, determined from step 5 will be provided to achieve the P_{Target}; and

7) Calculate the cumulative phosphorus load reduction in pounds of phosphorus (BMP-Reduction $_{lbs\text{-}P}$) for the structural BMP using the BMP Load (as calculated from the procedure in Attachment 1 to Appendix F) and P_{target} by using equation 3-2:

BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P_{target} /100) **(Equation 3-2)**

Example 3-2 to determine design volume of a structural BMP with a 100% impervious drainage area to achieve a known phosphorus load reduction target:

A permittee is considering a surface infiltration practice to capture and treat runoff from 2.57 acres (1.04 ha) of commercial impervious area that will achieve a 70% reduction in annual phosphorus load. The infiltration practice would be located adjacent to the impervious area. The permittee has measured an infiltration rate (IR) of 0.39 inches per hour (in/hr) in the vicinity of the proposed infiltration practice. Determine the:

A) Design storage volume needed for an surface infiltration practice to achieve a 70% reduction in annual phosphorus load from the contributing drainage area (BMP-Volume $_{IA\text{-}ft^3}$); and

B) Cumulative phosphorus reduction in pounds that would be accomplished by the BMP (BMP-Reduction $_{lbs\text{-}P}$)

Solution:

1) Contributing impervious drainages area (IA) = 2.57 acres

BMP type is a surface infiltration practice (i.e., basin) with an infiltration rate (IR) of 0.39 in/hr

Solution continued:

3) Phosphorus load reduction target (P_{target}) = 70%

4) The performance curve for the infiltration basin (i.e., surface infiltration practice), Figure 3-8, IR = 0.27 in/hr is used to determine the design storage volume of the BMP (BMP-Volume $_{IA\text{-}in}$) needed to treat runoff from the contributing IA and achieve a P_{target} = 70%. The curve for an infiltration rate of 0.27 in/hr is chosen because 0.27 in/hr is the nearest simulated IR that is less than the field measured IR of 0.39 in/hr. From Figure 3-8, the BMP-Volume $_{IA\text{-}in}$ for a P_{target} = 70% is 0.36 in.

5) The BMP-Volume $_{IA\text{-}in}$ is converted to cubic feet (BMP-Volume $_{IA\text{-}ft^3}$) using Equation 3-1:

BMP-Volume $_{IA\text{-}ft^3}$ = IA (acre) x BMP-Volume $_{IA\text{-}in}$ x 3,630 ft^3/acre-in
BMP-Volume $_{IA\text{-}ft^3}$ = 2.57 acre x 0.36 in x 3,630 ft^3/acre-in
= **3,359 ft^3**

6) A narrow trapezoidal infiltration basin with the following characteristics is proposed to achieve the P_{Target} of 70%:

Length (ft)	Design Depth (ft)	Side Slopes	Bottom area (ft^2)	Pond surface area (ft^2)	Design Storage Volume (ft^3)
355	1.25	3:1	1,387	4,059	3,404

The volume of the proposed infiltration practice, 3,404 ft^3, exceeds the BMP-Volume $_{IA\text{-}ft^3}$ needed, 3,359 ft^3 and is sufficient to achieve the P Target of 70%.

7) The cumulative phosphorus load reduction in pounds of phosphorus for the infiltration practice (BMP-Reduction $_{lbs\text{-}P}$) is calculated using Equation 3-2. The BMP Load is first determined using the method described above.

BMP Load = IA x impervious cover phosphorus export loading rate for commercial use (see Table 3-1)
= 2.57 acres x 1.78 lbs/acre/yr
= 4.58 lbs/yr

BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P_{target} /100)
BMP-Reduction $_{lbs\text{-}P}$ = 4.58 lbs/yr x (70/100)
= **3.21 lbs/yr**

Alternate Solution: Alternatively, the permittee could determine the design storage volume needed for an IR = 0.39 in/hr by performing interpolation of the results from the surface

infiltration performance curves for IR = 0.27 in/hr and IR = 0.52 in/hr as follows (replacing steps 3 and 4 on the previous page):

Alternate solution continued:

Using the performance curves for the infiltration basin (i.e., surface infiltration practice), Figures 3-8, IR = 0.27 in/hr and 3-9, IR = 0.52 in/hr, interpolate between the curves to determine the design storage volume of the BMP (BMP-Volume $_{IA\text{-}in}$) needed to treat runoff from the contributing IA and achieve a P_{target} = 70%.

First calculate the interpolation adjustment factor (IAF) to interpolate between the infiltration basin performance curves for infiltration rates of 0.27 and 0.52 in/hr:

$$IAF = (0.39 - 0.27)/ (0.52 – 0.27) = 0.48$$

From the two performance curves, develop the following table to estimate the general magnitude of the needed storage volume for an infiltration swale with an IR = 0.39 in/hr and a P_{target} of 70%.

Table Example 3-1-1: Interpolation Table for determining design storage volume of infiltration basin with IR = 0.39 in/hr and a phosphorus load reduction target of 70%

BMP Storage Volume	% Phosphorus Load Reduction IR = 0.27 in/hr ($PR_{IR=0.27}$)	% Phosphorus Load Reduction IR = 0.52 in/hr ($PR_{IR=0.52}$)	Interpolated % Phosphorus Load Reduction IR = 0.39 in/hr ($PR_{IR=0.39}$) **$PR_{IR=0.39}$= IAF($PR_{IR=0.52}$ – $PR_{IR=0.27}$) + $PR_{IR=0.27}$**
0.3	64%	67%	65%
0.4	74%	77%	75%
0.5	79%	82%	80%

As indicated from Table Example 3-1, the BMP-Volume $_{IA\text{-}in}$ for $PR_{IR=0.39}$ of 70% is between 0.3 and 0.4 inches and can be determined by interpolation:

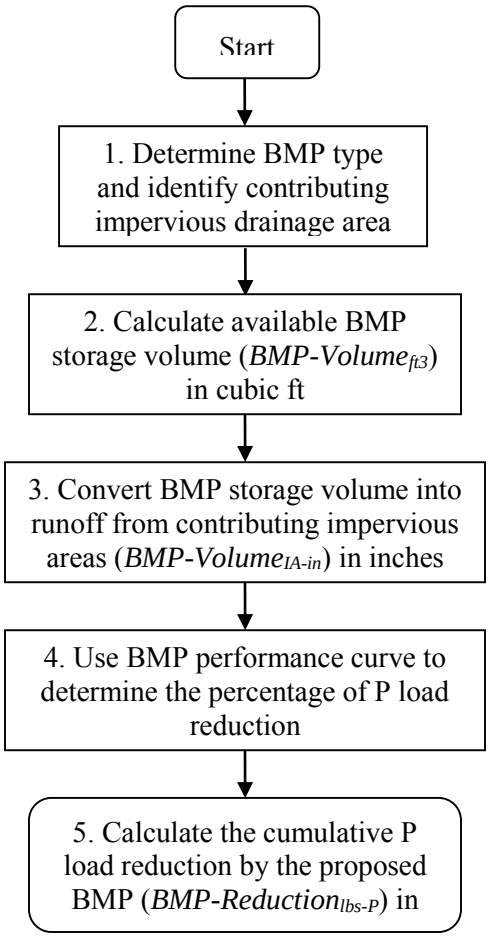
$$\text{BMP-Volume}_{IA\text{-}in} = (70\% - 65\%)/ (75\% - 65\%) \times (0.4 \text{ in} – 0.3 \text{ in}) + 0.3 \text{ in}$$
$$= 0.35 \text{ inches}$$

5 alternative) Convert the resulting BMP-Volume $_{IA\text{-}in}$ to cubic feet (BMP-Volume $_{IA\text{-}ft^3}$) using equation 3-1:

$$\text{BMP-Volume}_{IA\text{-}ft^3} = 2.57 \text{ acre} \times 0.35 \text{ in} \times 3{,}630 \text{ ft}^3/\text{acre-in}$$
$$= \mathbf{3{,}265 \text{ ft}^3}$$

(2) Method to determine the phosphorus load reduction for a structural BMP with a known design volume when the contributing drainage area is 100% impervious:

Flow Chart 2 illustrates the steps to determine the phosphorus load reduction for a structural BMP with a known design volume when the contributing drainage area is 100% impervious.



Flow Chart 2: Method to determine the phosphorus load reduction for a BMP with a known design volume when contributing drainage area is 100% impervious.

1) Identify the structural BMP type and contributing impervious drainage area (IA);

2) Document the available storage volume (ft^3) of the structural BMP (BMP-Volume $_{ft^3}$) using the BMP dimensions and design specifications (e.g., maximum storage depth, filter media porosity);

3) Convert BMP-Volume $_{ft^3}$ into inches of runoff from the contributing impervious area (BMP-Volume $_{IA\text{-}in}$) using equation 3-3:

BMP-Volume $_{IA\text{-}in}$ = BMP-Volume $_{ft^3}$/ IA (acre) x 12 in/ft x 1 acre/43560 ft^2 **(Equation 3-3)**

4) Determine the % phosphorus load reduction for the structural BMP (BMP Reduction $_{\%\text{-}P}$) using the appropriate BMP performance curve (Figures 3-1 through 3-18) and the BMP-Volume $_{IA\text{-}in}$ calculated in step 3; and

5) Calculate the cumulative phosphorus load reduction in pounds of phosphorus for the structural BMP (BMP Reduction $_{lbs-P}$) using the BMP Load as calculated from the procedure described above and the percent phosphorus load reduction determined in step 4 by using equation 3-4:

BMP Reduction $_{lbs-P}$ = BMP Load x (BMP Reduction $_{\%-P}$/100) **(Equation 3-4)**

Example 3-2: Determine the phosphorus load reduction for a structural BMP with a known storage volume capacity when the contributing drainage area is 100% impervious:

A permittee is considering a bio-filtration system to treat runoff from 1.49 acres of high density residential (HDR) impervious area. Site constraints would limit the bio-filtration system to have a surface area of 1200 ft^2 and the system would have to be located next to the impervious drainage area to be treated. The design parameters for the bio-filtration system are presented in Table Example 3-2-1.

Table Example 3-2-1: Design parameters for bio-filtration system for Example 3-2

Components of representation	Parameters	Value
Ponding	Maximum depth	0.5 ft
	Surface area	1200 ft^2
	Vegetative parameter[a]	85-95%
Soil mix	Depth	2.5 ft
	Porosity	0.40
	Hydraulic conductivity	4 inches/hour
Gravel layer	Depth	0.67 ft
	Porosity	0.40
	Hydraulic conductivity	14 inches/hour
Orifice #1	Diameter	0.5 ft

[a] Refers to the percentage of surface covered with vegetation

Determine the:

A) Percent phosphorus load reduction (BMP Reduction $_{\%-P}$) for the specified bio-filtration system and contributing impervious drainage area; and

B) Cumulative phosphorus reduction in pounds that would be accomplished by the bio-filtration system (BMP-Reduction $_{lbs-P}$)

Solution:

1) The BMP is a bio-filtration system that will treat runoff from 1.49 acres of impervious area (IA = 1.49 acre);

2) The available storage volume capacity (ft^3) of the bio-filtraton system (BMP-Volume $_{BMP-ft^3}$) is determined using the surface area of the system, depth of ponding, and the porosity of the filter media:

BMP-Volume $_{BMP-ft^3}$ = (surface area x pond maximum depth) + ((soil mix depth + gravel layer depth)/12 in/ft) x surface area x gravel layer porosity)
= (1,200 ft^2 x 0.5 ft) + ((38/12) x 1,200 ft^2 x 0.4)
= 2,120 ft^3

Solution continued:

3) The available storage volume capacity of the bio-filtration system in inches of runoff from the contributing impervious area (BMP-Volume $_{IA\text{-}in}$) is calculated using equation 3-3:

BMP-Volume $_{IA\text{-}in}$ = (BMP-Volume $_{ft}^3$/ IA (acre) x 12 in/ft x 1 acre/43560 ft^2
BMP-Volume $_{IA\text{-}in}$ = (2120 ft^3/1.49 acre) x 12 in/ft x 1 acre/43560 ft^2
= 0.39 in

4) Using the bio-filtration performance curve shown in Figure 3-13, a **51%** phosphorus load reduction (BMP Reduction %-P) is determined for a bio-filtration system sized for 0.39 in of runoff from 1.49 acres of impervious area; and

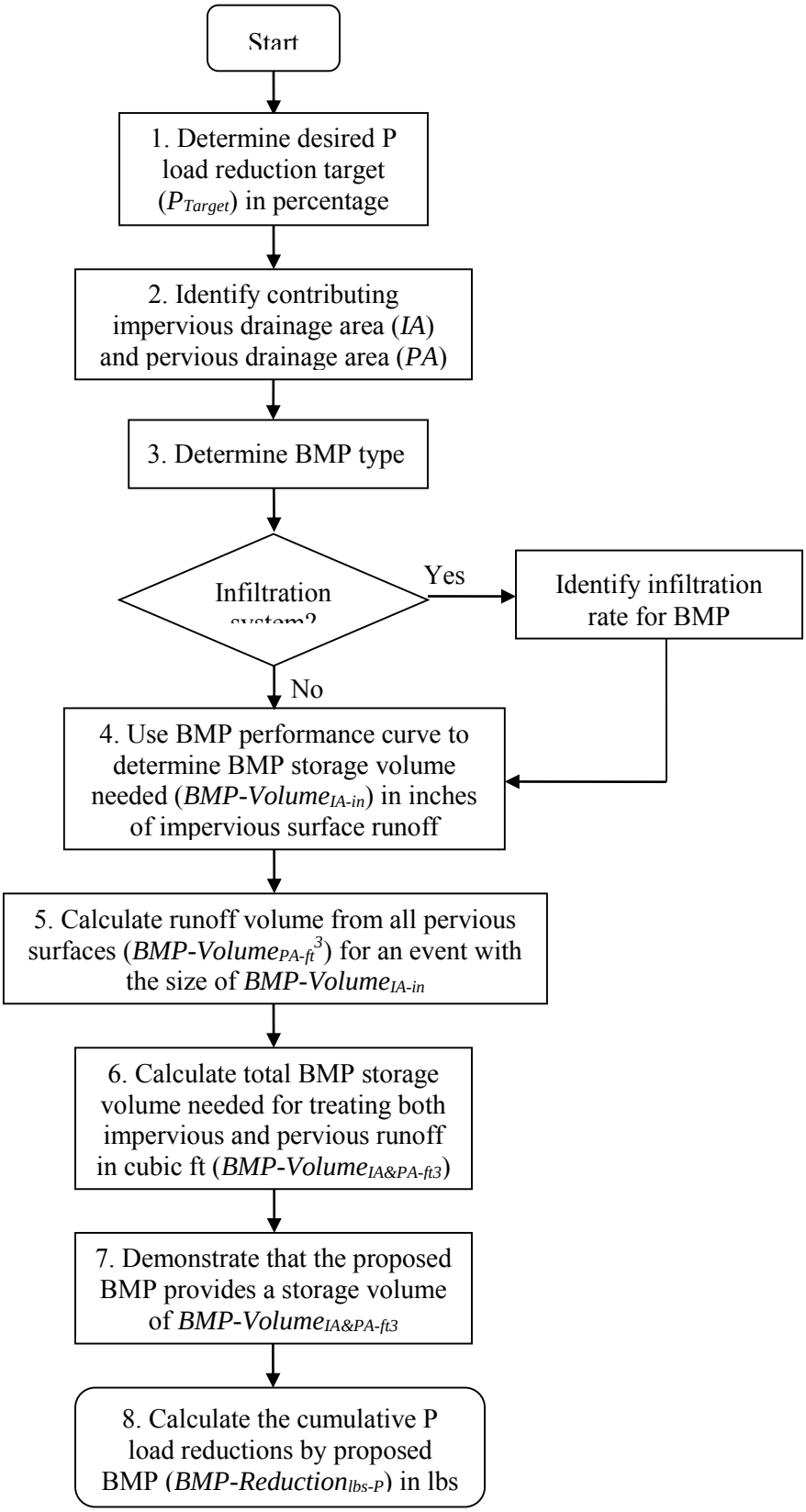
5) Calculate the cumulative phosphorus load reduction in pounds of phosphorus for the bio-filtration system (BMP Reduction $_{lbs\text{-}P}$) using the BMP Load as calculated from the procedure described above and the BMP Reduction $_{\%\text{-}P}$ determined in step 4 by using equation 3-4. First, the BMP Load is determined as specified above:

BMP Load = IA x impervious cover phosphorus export loading rate for HDR (see Table 3-1) = 1.49 acres x 2.32 lbs/acre/yr
= 3.46 lbs/yr

BMP Reduction $_{lbs\text{-}P}$ = BMP Load x (BMP Reduction $_{\%\text{-}P}$/100)
BMP Reduction $_{lbs\text{-}P}$ = 3.46 lbs/yr x (51/100)
= **1.76 lbs/yr**

(3) Method to determine the design storage volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area has impervious and pervious surfaces:

Flow Chart 3 illustrates the steps to determine the design storage volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area has impervious and pervious surfaces.


Start
1. Determine desired P load reduction target (P_{Target}) in percentage
2. Identify contributing impervious drainage area (*IA*) and pervious drainage area (*PA*)
3. Determine BMP type
Infiltration system?
Yes
Identify infiltration rate for BMP
No
4. Use BMP performance curve to determine BMP storage volume needed (*BMP-Volume*$_{IA\text{-}in}$) in inches of impervious surface runoff
5. Calculate runoff volume from all pervious surfaces (*BMP-Volume*$_{PA\text{-}ft}{}^{3}$) for an event with the size of *BMP-Volume*$_{IA\text{-}in}$
6. Calculate total BMP storage volume needed for treating both impervious and pervious runoff in cubic ft (*BMP-Volume*$_{IA\&PA\text{-}ft3}$)
7. Demonstrate that the proposed BMP provides a storage volume of *BMP-Volume*$_{IA\&PA\text{-}ft3}$
8. Calculate the cumulative P load reductions by proposed BMP (*BMP-Reduction*$_{lbs\text{-}P}$) in lbs

Flow Chart 3: Method to determine the design storage volume of a BMP to reach a known P load reduction when both impervious and pervious drainage areas are present.

1) Determine the desired cumulative phosphorus load reduction target (P_{target}) in percentage for the structural BMP;
2) Characterize the contributing drainage area to the structural BMP by identifying the following information for the impervious and pervious surfaces:
   Impervious area (IA) - Area (acre) and land use (e.g., commercial)

   Pervious area (PA) – Area (acre) and runoff depths based on hydrologic soil group (HSG) and rainfall depth. Table 3-3 provides values of runoff depth from pervious areas for various rainfall depths and HSGs. Soils are assigned to an HSG on the basis of their permeability. HSG A is the most permeable, and HSG D is the least permeable. HSG categories for pervious areas in the drainage area shall be estimated by consulting local soil surveys prepared by the National Resource Conservation Service (NRCS) or by a storm water professional evaluating soil testing results from the drainage area. If the HSG condition is not known, a HSG D soil condition should be assumed.

Table 3- 3: Developed Land Pervious Area Runoff Depths based on Precipitation depth and Hydrological Soil Groups (HSGs)

Developed Land Pervious Area Runoff Depths based on Precipitation depth and Hydrological Soil Groups					
Rainfall Depth, Inches	Runoff Depth, inches				
	Pervious HSG A	Pervious HSG B	Pervious HSG C	Pervious HSG C/D	Pervious HSG D
0.10	0.00	0.00	0.00	0.00	0.00
0.20	0.00	0.00	0.01	0.02	0.02
0.40	0.00	0.00	0.03	0.05	0.06
0.50	0.00	0.01	0.05	0.07	0.09
0.60	0.01	0.02	0.06	0.09	0.11
0.80	0.02	0.03	0.09	0.13	0.16
1.00	0.03	0.04	0.12	0.17	0.21
1.20	0.04	0.05	0.14	0.27	0.39
1.50	0.08	0.11	0.39	0.55	0.72
2.00	0.14	0.22	0.69	0.89	1.08

Notes: Runoff depths derived from combination of volumetric runoff coefficients from Table 5 of *Small Storm Hydrology and Why it is Important for the Design of Stormwater Control Practices*, (Pitt, 1999), and using the Stormwater Management Model (SWMM) in continuous model mode for hourly precipitation data for Boston, MA, 1998-2002.

3) Determine the structural BMP type (e.g., infiltration trench, gravel wetland). For infiltration systems, determine the appropriate infiltration rate for the location of the BMP in the Watershed;
4) Using the cumulative phosphorus removal performance curve for the selected structural BMP, determine the storage volume capacity of the BMP in inches needed to treat runoff from the contributing impervious area (BMP-Volume $_{IA\text{-}in}$);

5) Using Equation 3-5 below and the pervious area runoff depth information from Table 3-3-1, determine the total volume of runoff from the contributing pervious drainage area in cubic feet (BMP Volume $_{PA\text{-}ft^3}$) for a rainfall size equal to the sum of BMP Volume $_{IA\text{-}in}$, determined in step 4. The runoff volume for each distinct pervious area must be determined;

   BMP-Volume $_{PA\ ft^3} = \sum$ (PA x (runoff depth) x 3,630 ft^3/acre-in) $_{(PA1,\ldots\ PAn)}$ **(Equation 3-5)**

6) Using equation 3-6 below, calculate the BMP storage volume in cubic feet (BMP-Volume $_{IA\&PA\text{-}ft^3}$) needed to treat the runoff depth from the contributing impervious (IA) and pervious areas (PA);

   BMP-Volume $_{IA\&PA\text{-}ft^3}$ = BMP Volume $_{PA\text{-}ft^3}$ + (BMP Volume $_{IA\text{-}in}$ x IA (acre) x 3,630 ft^3/acre-in) **(Equation 3-6)**

7) Provide supporting calculations using the dimensions and specifications of the proposed structural BMP showing that the necessary storage volume determined in step 6, BMP-Volume $_{IA\&PA\text{-}ft^3}$, will be provided to achieve the P $_{Target}$; and

8) Calculate the cumulative phosphorus load reduction in pounds of phosphorus (BMP-Reduction $_{lbs\text{-}P}$) for the structural BMP using the BMP Load (as calculated from the procedure in Attachment 1 to Appendix F) and the P $_{target}$ by using equation 3-2:

BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P $_{target}$ /100) **(Equation 3-2)**

Example 3-3: Determine the design storage volume of a structural BMP to achieve a known phosphorus load reduction target when the contributing drainage area has impervious and pervious surfaces

A permittee is considering a gravel wetland system to treat runoff from a high-density residential (HDR) site. The site is 7.50 acres of which 4.00 acres are impervious surfaces and 3.50 acres are pervious surfaces. The pervious area is made up of 2.5 acres of lawns in good condition surrounding cluster housing units and 1.00 acre of stable unmanaged woodland. Soils information indicates that all of the woodland and 0.50 acres of the lawn is hydrologic soil group (HSG) B and the other 2.00 acres of lawn are HSG C. The permittee wants to size the gravel wetland system to achieve a cumulative phosphorus load reduction (P $_{Target}$) of 55% from the entire 7.50 acres.

Determine the:

A) Design storage volume needed for a gravel wetland system to achieve a 55% reduction in annual phosphorus load from the contributing drainage area (BMP-Volume $_{IA\&PA\text{-}ft^3}$); and
B) Cumulative phosphorus reduction in pounds that would be accomplished by the BMP (BMP-Reduction $_{lbs\text{-}P}$)

Example 3-3 continued:
Solution:

1) The BMP type is gravel wetland system.

2) The phosphorus load reduction target (P_{Target}) = 55%.

3) Using the cumulative phosphorus removal performance curve for the gravel wetland system shown in Figure 3-14, the storage volume capacity in inches needed to treat runoff from the contributing impervious area (BMP Volume $_{IA\text{-}in}$) is 0.71 in;

Using equation 3-5 and the pervious runoff depth information from Table 3-3, the volume of runoff from the contributing pervious drainage area in cubic feet (BMP Volume $_{PA-ft^3}$) for a rainfall size equal to 0.71 in is summarized in Table Example 3-3-A. As indicated from Table 3-3, the runoff depth for a rainfall size equal to 0.71 inches is between 0.6 and 0.8 inches and can be determined by interpolation (example shown for runoff depth of HSG C):

Runoff depth (HSG C) = (0.71 – 0.6)/(0.8 – 0.6) x (0.09 in – 0.06 in) + 0.06 in
= 0.07 inches

Table Example 3-3-A: Runoff contributions from pervious areas for HDR site

ID	Type	Pervious Area (acre)	HSG	Runoff (in)	Runoff = (runoff) x PA (acre-in)	Runoff = Runoff (acre-in) x 3630 ft^3/acre-in (ft^3)
PA1	Grass	2.00	C	0.07	0.14	508
PA2	Grass	0.50	B	0.01	0.0	0.0
PA3	Woods	1.00	B	0.01	0.0	0.0
Total	-----	**3.50**	-----	-----	**0.14**	**508**

4) Using equation 3-6, determine the BMP storage volume in cubic feet (BMP-Volume $_{IA\&PA\text{-}ft^3}$) needed to treat 0.71 inches of runoff from the contributing impervious area (IA) and the runoff of 0.14 acre-in from the contributing pervious areas, determined in step 5 is:

BMP Volume$_{IA\&PA\text{-}ft^3}$ = BMP Volume $_{PA\ ac\text{-}in}$ + (BMP Volume $_{IA\text{-}in}$ x IA (acre)) x 3,630 ft^3/acre-in)

BMP Volume$_{IA\&PA\text{-}ft^3}$ = (508 ft^3+ (0.71 in x 4.00 acre)) x 3,630 ft^3/acre-in
= 10,817 ft^3

5) Table Example 3-3-B provides design details for of a potential gravel wetland system

Solution continued:

Table Example 3-3-B: Design details for gravel wetland system

Gravel Wetland System Components	Design Detail	Depth (ft)	Surface Area (ft^2)	Volume (ft^3)
Sediment Forebay	**10% of Treatment Volume**			
Pond area	**----**	1.33	896	1,192
Wetland Cell #1	**45% of Treatment Volume**	----------	----------	----------
Pond area	**----**	2.00	1,914	3,828
Gravel layer	porosity = 0.4	2.00	1,914	1,531
Wetland Cell #2	**45% of Treatment Volume**	----------	----------	----------
Pond area	**----**	2.00	1,914	3,828
Gravel layer	porosity = 0.4	2.00	1,914	1,531

The total design storage volume for the proposed gravel wetland system identified in Table Example 3-3-C is 11,910 ft^3. This volume is greater than 11,834 ft^3 ((BMP-Volume $_{IA\&PA\text{-}ft^3}$), calculated in step 6) and is therefore sufficient to achieve a P_{Target} of 55%.

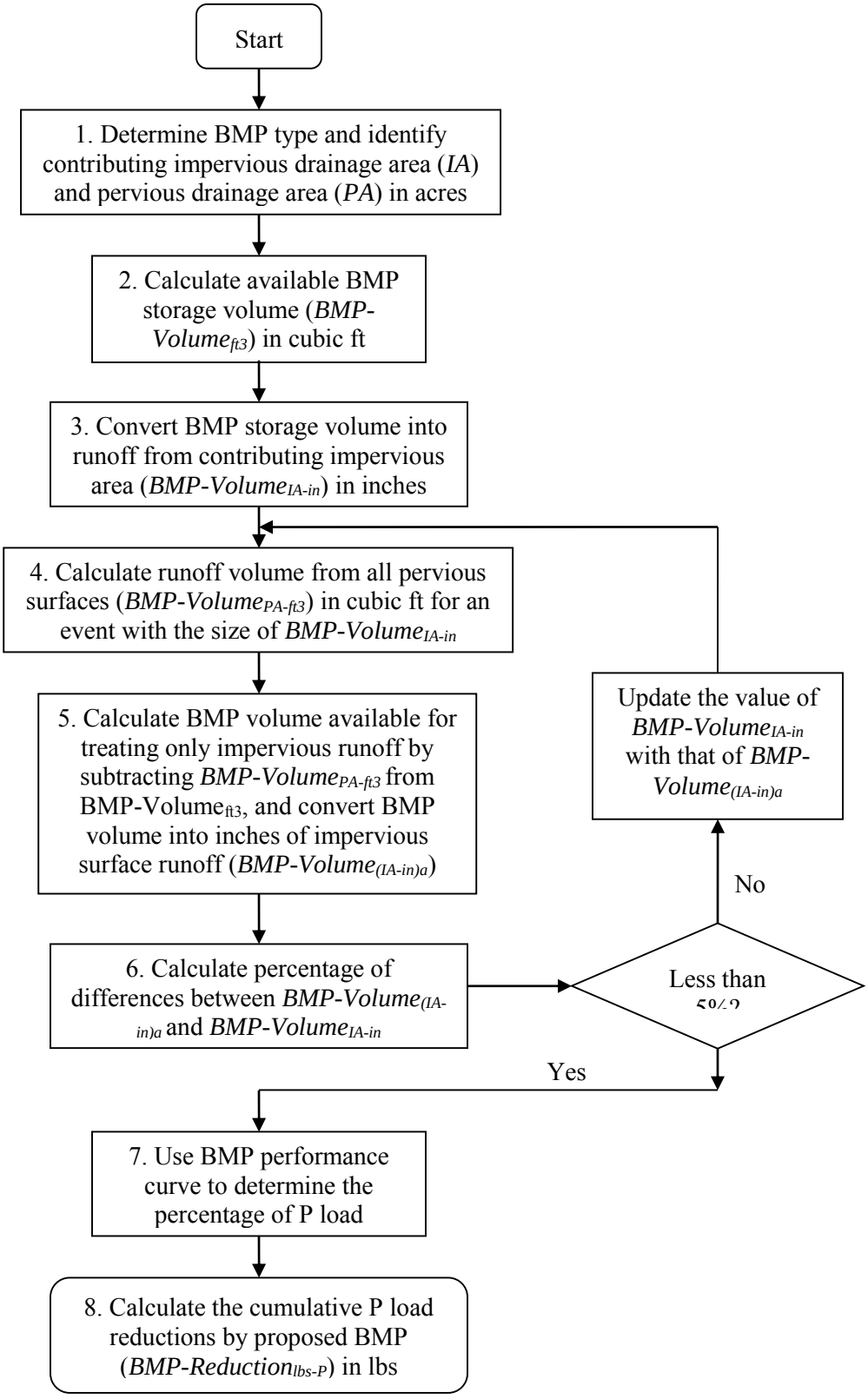
6) The cumulative phosphorus load reduction in pounds of phosphorus (BMP-Reduction $_{lbs\text{-}P}$) for the proposed gravel wetland system is calculated by using equation 3-2 with the BMP Load and the P_{target} = 55%.

BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P_{target} /100) (**Equation 3-2**)

Using Table 3-1, the BMP Load is calculated:
BMP Load = (IA x PLER $_{HDR}$) + (PA lawn $_{HSG\,B}$ x PLER $_{HSG\,B}$) + (PA lawn $_{HSG\,C}$ x PLER $_{HSG\,C}$) +(PA forest x PA PLER $_{For}$)
= (4.00 acre x 2.32 lbs/acre/yr) + (0.50 acres x 0.12 lbs/acre/yr) + (1.00 acre x 0.21 lbs/acre/yr) + (1.00 acres x 0.13)
= 9.68 lbs/yr
BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P_{target} /100)
BMP-Reduction $_{lbs\text{-}P}$ = 9.68 lbs/yr x 55/100
= **5.32 lbs/yr**

(4) Method to determine the phosphorus load reduction for a structural BMP with a known storage volume when the contributing drainage area has impervious and pervious surfaces:

Flow Chart 4 illustrates the steps to determine the phosphorus load reduction for a structural BMP with a known storage volume when the contributing drainage area has impervious and pervious surfaces.


Start
1. Determine BMP type and identify contributing impervious drainage area (*IA*) and pervious drainage area (*PA*) in acres
2. Calculate available BMP storage volume (*BMP-Volume*$_{ft3}$) in cubic ft
3. Convert BMP storage volume into runoff from contributing impervious area (*BMP-Volume*$_{IA\text{-}in}$) in inches
4. Calculate runoff volume from all pervious surfaces (*BMP-Volume*$_{PA\text{-}ft3}$) in cubic ft for an event with the size of *BMP-Volume*$_{IA\text{-}in}$
5. Calculate BMP volume available for treating only impervious runoff by subtracting *BMP-Volume*$_{PA\text{-}ft3}$ from BMP-Volume$_{ft3}$, and convert BMP volume into inches of impervious surface runoff (*BMP-Volume*$_{(IA\text{-}in)a}$)
6. Calculate percentage of differences between *BMP-Volume*$_{(IA\text{-}in)a}$ and *BMP-Volume*$_{IA\text{-}in}$
Less than
No
Update the value of *BMP-Volume*$_{IA\text{-}in}$ with that of *BMP-Volume*$_{(IA\text{-}in)a}$
Yes
7. Use BMP performance curve to determine the percentage of P load
8. Calculate the cumulative P load reductions by proposed BMP (*BMP-Reduction*$_{lbs\text{-}P}$) in lbs

Flow Chart 4: Method to determine the phosphorus load reduction for a BMP with known storage volume when both pervious and impervious drainage areas are present.

1) Identify the type of structural BMP and characterize the contributing drainage area to the structural BMP by identifying the following information for the impervious and pervious surfaces:

Impervious area (IA) – Area (acre) and land use (e.g., commercial)

Pervious area (PA) – Area (acre) and runoff depth based on hydrologic soil group (HSG) and size of rainfall event. Table 3-3 provides values of runoff depth for various rainfall depths and HSGs. Soils are assigned to an HSG based on their permeability. HSG categories for pervious areas in the Watershed shall be estimated by consulting local soil surveys prepared by the National Resource Conservation Service (NRCS) or by a storm water professional evaluating soil testing results from the Watershed. If the HSG condition is not known, a HSG C/D soil condition should be assumed.

2) Determine the available storage volume (ft^3) of the structural BMP (BMP-Volume $_{ft^3}$) using the BMP dimensions and design specifications (e.g., maximum storage depth, filter media porosity);

3) To estimate the phosphorus load reduction of a BMP with a known storage volume capacity, it is first necessary to determine the portion of available BMP storage capacity (BMP-Volume $_{ft^3}$) that would treat the runoff volume generated from the contributing impervious area (IA) for a rainfall event with a depth of *i* inches (in). This will require knowing the corresponding amount of runoff volume that would be generated from the contributing pervious area (PA) for the same rainfall event (depth of *i* inches). Using equation 3-6a below, solve for the BMP capacity that would be available to treat runoff from the contributing imperious area for the unknown rainfall depth of *i* inches (see equation 3-6b):

$$\text{BMP-Volume}_{ft^3} = \text{BMP-Volume}_{(IA\text{-}ft^3)i} + \text{BMP-Volume}_{(PA\text{-}ft^3)i} \quad \textbf{(Equation 3-6a)}$$

Where:

BMP-Volume $_{ft^3}$= the available storage volume of the BMP;

BMP-Volume $_{(IA\text{-}ft^3)i}$ = the available storage volume of the BMP that would fully treat runoff generated from the contributing impervious area for a rainfall event of size *i* inches; and

BMP-Volume $_{(PA\text{-}ft^3)i}$ = the available storage volume of the BMP that would fully treat runoff generated from the contributing pervious area for a rainfall event of size *i* inches

Solving for BMP-Volume $_{(IA\text{-}ft^3)i}$:

$$\text{BMP-Volume}_{(\text{IA-ft}^3)i} = \text{BMP-Volume}_{\text{ft}^3} - \text{BMP-Volume}_{(\text{PA-ft}^3)i} \quad \textbf{(Equation 3-6b)}$$

To determine $\text{BMP-Volume}_{(\text{IA-ft}^3)i}$, requires performing an iterative process of refining estimates of the rainfall depth used to calculate runoff volumes until the rainfall depth used results in the sum of runoff volumes from the contributing IA and PA equaling the available BMP storage capacity ($\text{BMP-Volume}_{\text{ft}^3}$). For the purpose of estimating BMP performance, it will be considered adequate when the IA runoff depth (in) is within 5% IA runoff depth used in the previous iteration.

For the first iteration (1), convert the $\text{BMP-Volume}_{\text{ft}^3}$ determined in step 2 into inches of runoff from the contributing impervious area ($\text{BMP Volume}_{(\text{IA-in})1}$) using equation 3-7a.

$\text{BMP-Volume}_{(\text{IA-in})1} = (\text{BMP-Volume}_{\text{ft}^3}/\text{IA (acre)}) \times (12 \text{ in/ft} / 43{,}560 \text{ ft}^2/\text{acre})$ **(Equation 3-7a)**;

For iterations 2 through n (2…n), convert the BMP Volume $_{(\text{IA-ft}^3)2\ldots n}$, determined in step 5a below, into inches of runoff from the contributing impervious area ($\text{BMP Volume}_{(\text{IA-in})2\ldots n}$) using equation 3-7b.

$\text{BMP-Volume}_{(\text{IA-in})2\ldots n} = (\text{BMP-Volume}_{(\text{IA-ft}^3)2\ldots n} / \text{IA (acre)}) \times (12 \text{ in/ft} / 43{,}560 \text{ ft}^2/\text{acre})$ **(Equation 3-7b)**;

4) For 1 to n iterations, use the pervious runoff depth information from Table 3-3 and equation 3-8 to determine the total volume of runoff (ft^3) from the contributing PA (BMP Volume $_{\text{PA-ft}^3}$) for a rainfall size equal to the sum of $\text{BMP-Volume}_{(\text{IA-in})1}$, determined in step 3. The runoff volume for each distinct pervious area must be determined.

$\text{BMP Volume}_{(\text{PA-ft}^3)1\ldots n} = \sum ((\text{PA} \times (\text{runoff depth})_{(\text{PA1, PA2..PAn})} \times (3{,}630 \text{ ft}^3/\text{acre-in})$ **(Equation 3-8)**

5) For iteration 1, estimate the portion of BMP Volume that is available to treat runoff from only the IA by subtracting $\text{BMP-Volume}_{\text{PA-ft}^3}$, determined in step 4, from $\text{BMP-Volume}_{\text{ft}^3}$, determined in step 2, and convert to inches of runoff from IA (see equations 3-9a and 3-9b):

$\text{BMP-Volume}_{(\text{IA-ft}^3)2} = ((\text{BMP-Volume}_{\text{ft}^3} - \text{BMP Volume}_{(\text{PA-ft}^3)1})$ **(Equation 3-9a)**

$\text{BMP-Volume}_{(\text{IA-in})2} = (\text{BMP-Volume}_{(\text{IA-ft}^3)2}/\text{IA (acre)}) \times (12 \text{ in/ft} \times 1 \text{ acre}/43{,}560 \text{ ft}^2)$ **(Equation 3-9b)**

If additional iterations (i.e., 2 through n) are needed, estimate the portion of BMP volume that is available to treat runoff from only the IA ($\text{BMP-Volume}_{(\text{IA-in})3..n+1}$) by subtracting $\text{BMP Volume}_{(\text{PA-ft}^3)2..n}$, determined in step 4, from $\text{BMP Volume}_{(\text{IA-ft}^3)3..n+1}$, determined in step 5, and by converting to inches of runoff from IA using equation 3-9b):

6) For iteration a (an iteration between 1 and n+1), compare BMP Volume $_{(IA\text{-}in)a}$ to BMP Volume $_{(IA\text{-}in)a\text{-}1}$ determined from the previous iteration (a-1). If the difference in these values is greater than 5% of BMP Volume $_{(IA\text{-}in)a}$ then repeat steps 4 and 5, using BMP Volume $_{(IA\text{-}in)a}$ as the new starting value for the next iteration (a+1). If the difference is less than or equal to 5 % of BMP Volume $_{(IA\text{-}in)a}$ then the permittee may proceed to step 7;

7) Determine the % phosphorus load reduction for the structural BMP (BMP Reduction $_{\%\text{-}P}$) using the appropriate BMP performance curve and the BMP-Volume $_{(IA\text{-}in)n}$ calculated in the final iteration of step 5; and

8) Calculate the cumulative phosphorus load reduction in pounds of phosphorus for the structural BMP (BMP Reduction $_{lbs\text{-}P}$) using the BMP Load as calculated from the procedure in Attachment 1 to Appendix F and the percent phosphorus load reduction (BMP Reduction $_{\%\text{-}P}$) determined in step 7 by using equation 3-4:

BMP Reduction $_{lbs\text{-}P}$ = BMP Load x (BMP Reduction $_{\%\text{-}P}$/100) **(Equation 3-4)**

Example 3-4: Determine the phosphorus load reduction for a structural BMP with a known design volume when the contributing drainage area has impervious and pervious surfaces

A permittee is considering an infiltration basin to capture and treat runoff from a portion of the medium density residential area (MDR). The contributing drainage area is 16.55 acres and has 11.75 acres of impervious area and 4.8 acres of pervious area (PA) made up mostly of lawns and landscaped areas that is 80% HSG D and 20% HSG C. An infiltration basin with the following specifications can be placed at the down-gradient end of the contributing drainage area where soil testing results indicates an infiltration rate (IR) of 0.28 in/hr:

Table Example 3-4-A: Infiltration basin characteristics

Structure	Bottom area (acre)	Top surface area (acre)	Maximum pond depth (ft)	Design storage volume (ft^3)	Infiltration Rate (in/hr)
Infiltration basin	0.65	0.69	1.65	48,155	0.28

Determine the:

A) Percent phosphorus load reduction (BMP Reduction $_{\%\text{-}P}$) for the specified infiltration basin and the contributing impervious and pervious drainage area; and

B) Cumulative phosphorus reduction in pounds that would be accomplished by the BMP (BMP-Reduction $_{lbs\text{-}P}$)

Example continued:

Solution:

1) A surface infiltration basin is being considered. Information for the contributing impervious (IA) and pervious (PA) areas are summarized in Tables Example 3-4-A and Example 3-4-B, respectively.

Table Example 3-4-B: Impervious area characteristics

ID	Land use	Area (acre)
IA1	MDR	11.75

Table Example 3-4-C: Pervious area characteristics

ID	Area (acre)	Hydrologic Soil Group (HSG)
PA1	3.84	D
PA2	0.96	C

2) The available storage volume (ft^3) of the infiltration basin (BMP-Volume $_{ft^3}$) is determined from the design details and basin dimensions; BMP-Volume $_{ft^3} = 48{,}155\ ft^3$.

3) To determine what the BMP design storage volume is in terms of runoff depth (in) from IA, an iterative process is undertaken:

Solution Iteration 1

For the first iteration (1), the BMP-Volume$_{ft^3}$ is converted into inches of runoff from the contributing impervious area (BMP Volume $_{(IA\text{-}in)1}$) using equation 3-5a.

BMP Volume $_{(IA\text{-}in)1}$ = (48,155 ft^2/ 11.75 acre) x (12 in/ft /43,560 ft^2/acre)
= 1.13 in

4-1) The total volume of runoff (ft^3) from the contributing PA (BMP Volume $_{PA\text{-}ft^3}$) for a rainfall size equal to the sum of BMP Volume $_{(IA\text{-}in)1}$ determined in step 3 is determined for each distinct pervious area identified in Table Example 3-4-B using the information from Table 3-3 and equation 3-5. Interpolation was used to determine runoff depths.

BMP Volume $_{(PA\text{-}ft^3)1}$ = ((3.84 acre x (0.33 in) + (0.96 acre x (0.13 in)) x 3,630 ft^3/acre-in
= 5052 ft^3

5-1) For iteration 1, the portion of BMP Volume that is available to treat runoff from only the IA is estimated by subtracting the BMP Volume $_{(PA\text{-}ft^3)1}$, determined in step 4-1, from BMP Volume$_{ft^3}$, determined in step 2, and converted to inches of runoff from IA:

BMP Volume $_{(IA\text{-}ft^3)2}$ = 48,155 ft^3 – 5052 ft^3
= 43,103 ft^3
BMP Volume $_{(IA\text{-}in)2}$ = (43,103 ft^3/11.75 acre) x (12 in/ft x 1 acre/43,560 ft^2)
= 1.01 in

Solution continued:

6-1) The % difference between BMP Volume $_{(IA\text{-}in)\,2}$, 1.01 in, and BMP Volume $_{(IA\text{-}in)1}$, 1.13 in is determined and found to be significantly greater than 5%:

% Difference = ((1.13 in – 1.01 in)/1.01 in) x 100
= 12%

Therefore, steps 4 through 6 are repeated starting with BMP Volume $_{(IA\text{-}in)\,2}$ = 1.01 in.

Solution Iteration 2

4-2) BMP-Volume $_{(PA\text{-}ft^3)2}$ = ((3.84 acre x 0.21 in) + (0.96 acre x 0.12 in)) x 3,630 ft^3/acre-in
= 3,358 ft^3

5-2) BMP-Volume $_{(IA\text{-}ft^3)\,3}$ = 48,155 ft^3 – 3,358 ft^3
= 44,797 ft^3
BMP-Volume $_{(IA\text{-}in)\,3}$ = (44,797 ft^3/11.75 acre) x (12 in/ft x 1 acre/43,560 ft^2)
= 1.05 in

6-2) % Difference = ((1.05 in – 1.01 in)/1.05 in) x 100
= 4%

The difference of 4% is acceptable.

7) The % phosphorus load reduction for the infiltration basin (BMP Reduction $_{\%\text{-}P}$) is determined by using the infiltration basin performance curve for an infiltration rate of 0.27 in/hr and the treatment volume (BMP-Volume $_{Net\ IA\text{-}in}$ = 1.05 in) calculated in step 5-2 and is **BMP Reduction $_{\%\text{-}P}$ = 93%**.

The performance curve for IR = 0.27 is used rather than interpolating between the performance curves for IR = 0.27 in/hr and 0.52 in/hr to estimate performance for IR = 0.28 in/hr. An evaluation of the performance curves for IR = 0.27 in/hr and IR = 0.52 in/hr for a design storage volume of 1.05 in indicate a small difference in estimated performance (BMP Reduction $_{\%\text{-}P}$ = 93% for IR = 0.27 in/hr and BMP Reduction $_{\%\text{-}P}$ = 95% for IR = 0.52 in/hr).

8) The cumulative phosphorus load reduction in pounds of phosphorus (BMP-Reduction $_{lbs\text{-}P}$) for the proposed infiltration basin is calculated by using equation 3-2 with the BMP Load and the P $_{target}$ of 93%.
BMP-Reduction $_{lbs\text{-}P}$ = BMP Load x (P $_{target}$ /100) **(Equation 3-2)**

Using Table 3-1, the BMP load is calculated:
BMP Load = (IA x impervious cover phosphorus export loading rate for industrial)
+ (PA $_{HSG\,D}$ x pervious cover phosphorus export loading rate for HSG D)
+ (PA $_{HSG\,C}$ x pervious cover phosphorus export loading rate for HSG C)

Solution continued:

= (11.75 acre x 1.96 lbs/acre/yr) + (3.84 acre x 0.37 lbs/acre/yr)
+ (0.96 acre x 0.21 lbs/acre/yr)
= 24.65 lbs/yr

BMP-Reduction $_{lbs-P}$ = 24.22 lbs/yr x 93/100 = **22.93 lbs/yr**

Example 3-5: Determine the phosphorus load reduction for disconnecting impervious area using storage with delayed release.

A commercial operation has an opportunity to divert runoff from 0.75 acres of impervious roof top to a 5000 gallon (668.4 ft^3) storage tank for temporary storage and subsequent release to 0.09 acres of pervious area (PA) with HSG C soils.
Determine the:

A) Percent phosphorus load reduction rates (BMP Reduction $_{\%-P}$) for the specified impervious area (IA) disconnection and storage system assuming release times of 1, 2 and 3 days for the stored volumes to discharge to the pervious area; and
B) Cumulative phosphorus reductions in pounds that would be accomplished by the system (BMP-Reduction $_{lbs-P}$) for the three storage release times, 1, 2 and 3 days.

Solution:

1. Determine the storage volume in units of inches of runoff depth from contributing impervious area:
   Storage Volume $_{IA-in}$ = (668.4 ft^3/(0.75 acre x 43.560 ft^2/acre)) x 12 inch/ft
   = 0.25 inches

2. Determine the ratio of the contributing impervious area to the receiving pervious area:
   IA:PA = 0.75 acres/0.09 acres
   = 8.3
3. Using Table 3-21 for a IA:PA ratio of 8:1, determine the phosphorus load reduction rates for a storage volume of 0.25 inches that discharges to HSG C with release rates of 1, 2 and 3 days: Using interpolation the reduction rates are shown in Table 3-5-A:

Table Example 3-5-A: Reduction Rates

Percent Phosphorus load reduction for IA disconnection with storage HSG C			
Storage Volume $_{IA-in}$	Storage release rate, days		
	1	2	3
0.25	39%	42%	43%

4. The cumulative phosphorus load reduction in pounds of phosphorus for the IA disconnection with storage (BMP-Reduction $_{lbs-P}$) is calculated using Equation 3-2. The BMP Load is first determined using the method described above.

Solution continued:

BMP Load = IA x phosphorus export loading rate for commercial IA (see Table 3-1)
= 0.75 acres x 1.78 lbs/acre/yr
= 1.34 lbs/yr

BMP Reduction $_{lbs-P}$ = BMP Load x (BMP Reduction $_{\%-P}$/100)

BMP Reduction $_{lbs-P}$ = 1.34 lbs/yr x (39/100)
= **0.53 lbs/yr**

Table Example 3-5-B presents the BMP Reduction $_{lbs-P}$ for each of the release rates:

Table Example 3-5-B: Reduction Load

Phosphorus load reduction for IA disconnection with storage HSG C, lbs			
Storage Volume $_{IA-in}$	Storage release rate, days		
	1	2	3
0.25	0.53	0.56	0.58

Example 3-6: Determine the phosphorus load reduction for disconnecting impervious area with and without soil augmentation in the receiving pervious area.

The same commercial property as in example 3-5 wants to evaluate disconnecting drainage from the 0.75 acre impervious roof top and discharging it directly to 0.09 acres of pervious area (PA) with HSG C. Also, the property has the opportunity to purchase a small adjoining area (0.06 acres), also HSG C,to increase the size of the receiving PA from 0.09 to 0.15 acres and to allow the property owner to avoid having to install a drainage structure to capture overflow runoff from the PA. The property owner has been informed that the existing PA soil can be tilled and augmented with soil amendments to support denser vegetative growth and improve hydrologic function to approximate HSG B.

Determine the:

A) Percent phosphorus load reduction rates (BMP Reduction $_{\%-P}$) for the specified impervious area (IA) disconnection to both the 0.09 and 0.15 acre receiving PAs with and without soil augmentation; and
B) Cumulative phosphorus reductions in pounds that would be accomplished by the IA disconnection for the various scenarios (BMP-Reduction $_{lbs-P}$).

Solution:

1. Determine the ratio of the contributing impervious area to the receiving pervious area:
   IA:PA = 0.75 acres/0.09 acres
   = 8.3
   IA:PA = 0.75 acres/0.15 acres
   = 5.0

Solution Continued:

2. Using Table 3-26 and Figure 3-40 for a IA:PA ratios of 8:1 and 5:1, respectively, determine the phosphorus load reduction rates for IA disconnections to HSG C and HSG B:

Table Example 3-6-A: Reduction Rates

Percent Phosphorus load reduction rates for IA disconnection		
Receiving PA	**IA:PA**	
	8:1	5:1
HSG C	7%	14%
HSG B (soil augmentation)	14%	22%

3. The cumulative phosphorus load reduction in pounds of phosphorus for the IA disconnection with storage (BMP-Reduction $_{lbs-P}$) is calculated using Equation 3-2. The BMP Load was calculated in example 3-5 and is 1.34 lbs/yr.

BMP Reduction $_{lbs-P}$ = BMP Load x (BMP Reduction $_{\%-P}$/100)
For PA of 0.09 acres HSG C the BMP Reduction $_{lbs-P}$ is calculated as follows:
BMP Reduction $_{lbs-P(0.09ac- HSG C)}$ = 1.34 lbs/yr x (7/100)
= **0.09 lbs/yr**
Table Example 3-6-B presents the BMP Reduction $_{lbs-P}$ for each of the scenarios:

Table Example 3-6-B: Reduction

Pounds Phosphorus load reduction for IA disconnection, lbs/yr		
Receiving PA	**Area of Receiving PA, acres**	
	0.09	**0.15**
HSG C	0.09	0.19
HSG B (soil augmentation)	0.19	0.29

Example 3-7: Determine the phosphorus load reduction for converting impervious area to permeable/pervious area.

A municipality is planning upcoming road reconstruction work in medium density residential (MDR) neighborhoods and has identified an opportunity to convert impervious surfaces to permeable/pervious surfaces by narrowing the road width of 3.7 miles (mi) of roadway from 32 feet (ft) to 28 ft and eliminating 3.2 miles of 4 ft wide paved sidewalk (currently there are sidewalks on both sides of the roadways targeted for restoration). The newly created permeable/pervious area will be tilled and treated with soil amendments to support vegetated growth in order to restore hydrologic function to at least HSG B.
Determine the:

A) Percent phosphorus load reduction rate (BMP Reduction $_{\%\text{-P}}$) for the conversion of impervious area (IA) to permeable/pervious area (PA); and
B) Cumulative phosphorus reduction in pounds that would be accomplished by the project (BMP-Reduction $_{\text{lbs-P}}$).

Solution:

1. Determine the area of IA to be converted to PA:
   New PA = (((3.7 mi x 4 ft) + (3.2 mi x 4 ft)) x 5280 ft/mi)/43,560 ft^2/acre
   = 3.35 acres

2. Using Table 3-27, the phosphorus load reduction rate for converting IA to HSG B is 94.1%
3. The BMP Load is first determined using the method described above.
   BMP Load = IA x phosphorus export loading rate for MDR IA (see Table 3-1)
   = 3.35 acres x 1.96 lbs/acre/yr
   = 6.57 lbs/yr
4. The cumulative phosphorus load reduction in pounds of phosphorus for the IA conversion (BMP-Reduction $_{\text{lbs-P}}$) is calculated using Equation 3-2.
   BMP Reduction $_{\text{lbs-P}}$ = BMP Load x (BMP Reduction $_{\%\text{-P}}$/100)
   BMP Reduction $_{\text{lbs-P}}$ = 6.57 lbs/yr x (94.1/100)
   = 6.18 lbs/yr

Table 3- 4: Infiltration Trench (IR = 0.17 in/hr) BMP Performance Table

Infiltration Trench (IR = 0.17 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	14.7%	27.6%	48.6%	64.1%	74.9%	82.0%	91.6%	95.4%
Cumulative Phosphorus Load Reduction	18%	33%	57%	73%	83%	90%	97%	99%

Figure 3- 1: BMP Performance Curve: Infiltration Trench (infiltration rate = 0.17 in/hr)

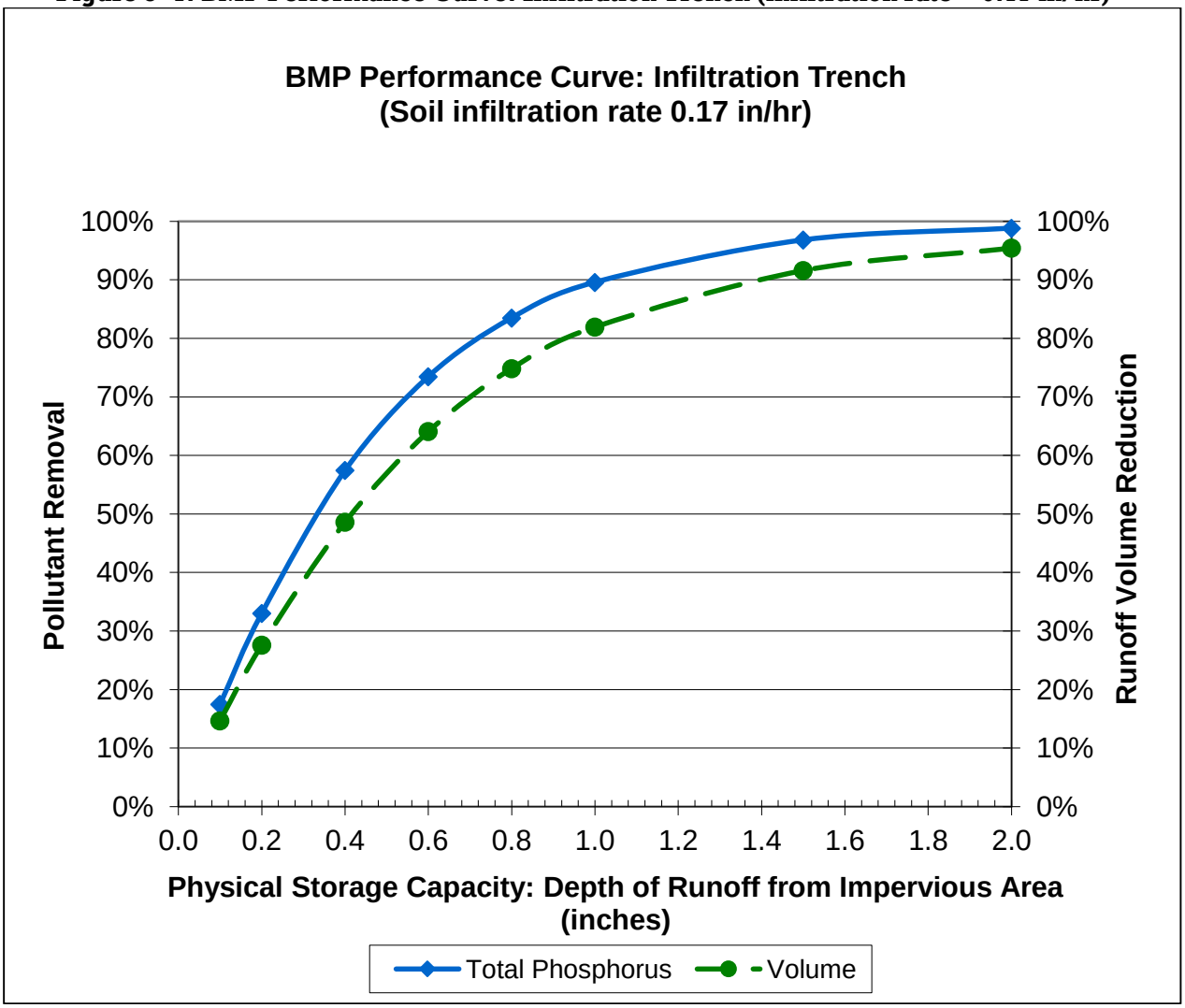


Table 3- 5: Infiltration Trench (IR = 0.27 in/hr) BMP Performance Table

Infiltration Trench (IR = 0.27 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	17.8%	32.5%	55.0%	70.0%	79.3%	85.2%	93.3%	96.3%
Cumulative Phosphorus Load Reduction	20%	37%	63%	78%	86%	92%	97%	99%

Figure 3- 2: BMP Performance Curve: Infiltration Trench (infiltration rate = 0.27 in/hr)

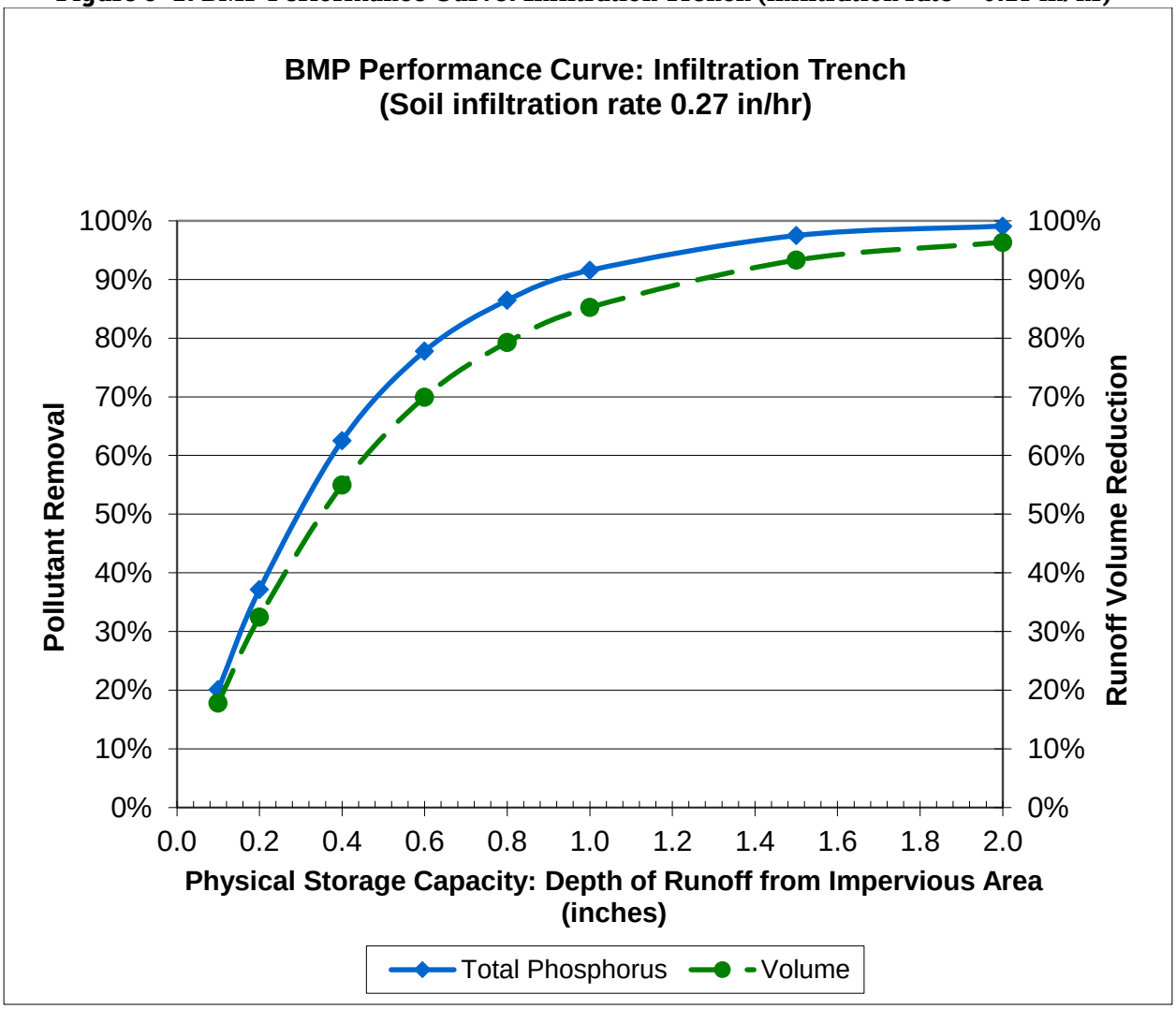


Table 3- 6: Infiltration Trench (IR = 0.52 in/hr) BMP Performance Table

Infiltration Trench (IR = 0.52 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	22.0%	38.5%	61.8%	75.7%	83.7%	88.8%	95.0%	97.2%
Cumulative Phosphorus Load Reduction	23%	42%	68%	82%	89%	94%	98%	99%

Figure 3- 3: BMP Performance Curve: Infiltration Trench (infiltration rate = 0.52 in/hr)

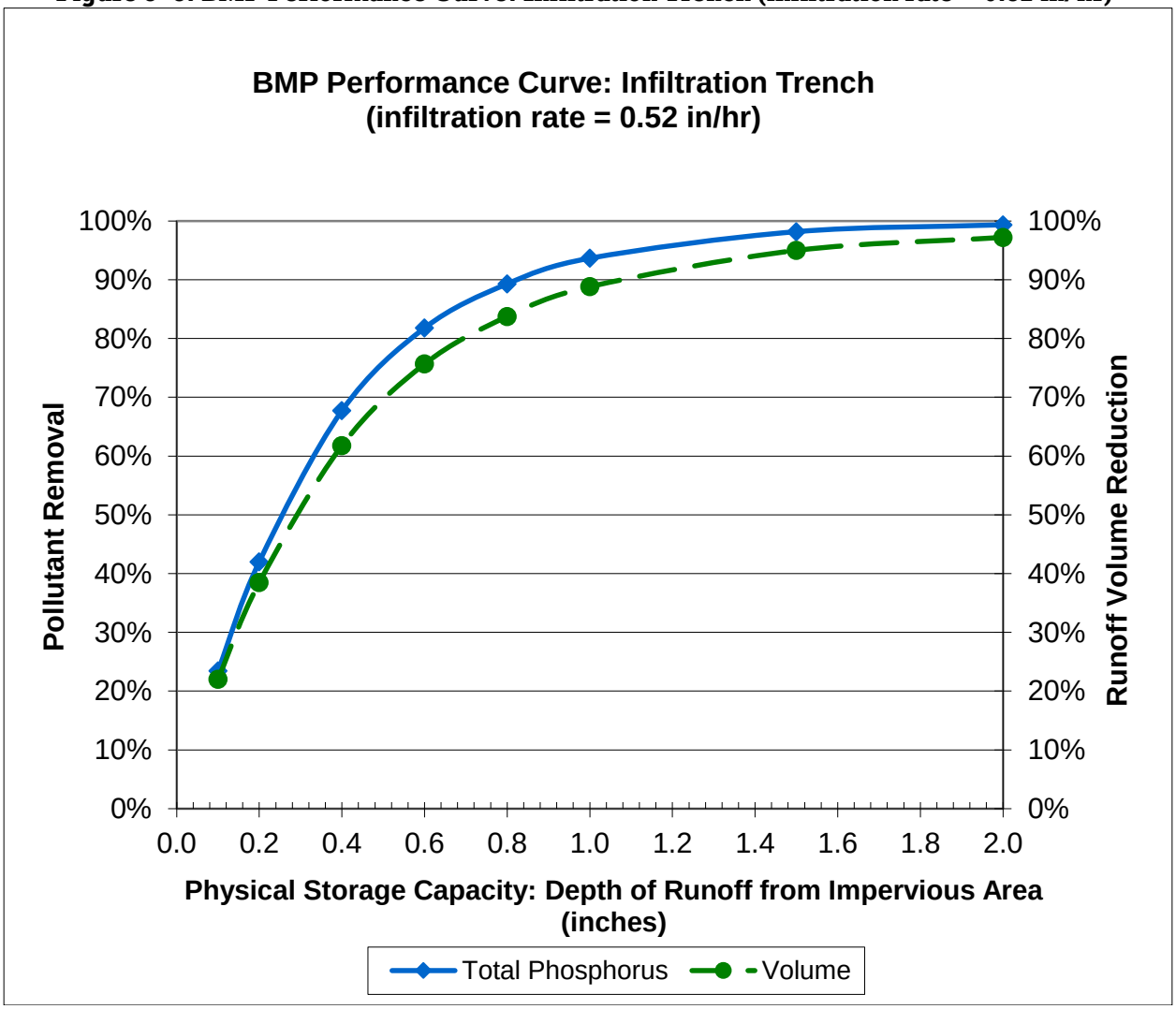


Table 3- 7: Infiltration Trench (IR = 1.02 in/hr) BMP Performance Table

Infiltration Trench (IR = 1.02 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	26.3%	44.6%	68.2%	81.0%	88.0%	92.1%	96.5%	98.3%
Cumulative Phosphorus Load Reduction	27%	47%	73%	86%	92%	96%	99%	100%

Figure 3- 4: BMP Performance Curve: Infiltration Trench (infiltration rate = 1.02 in/hr)

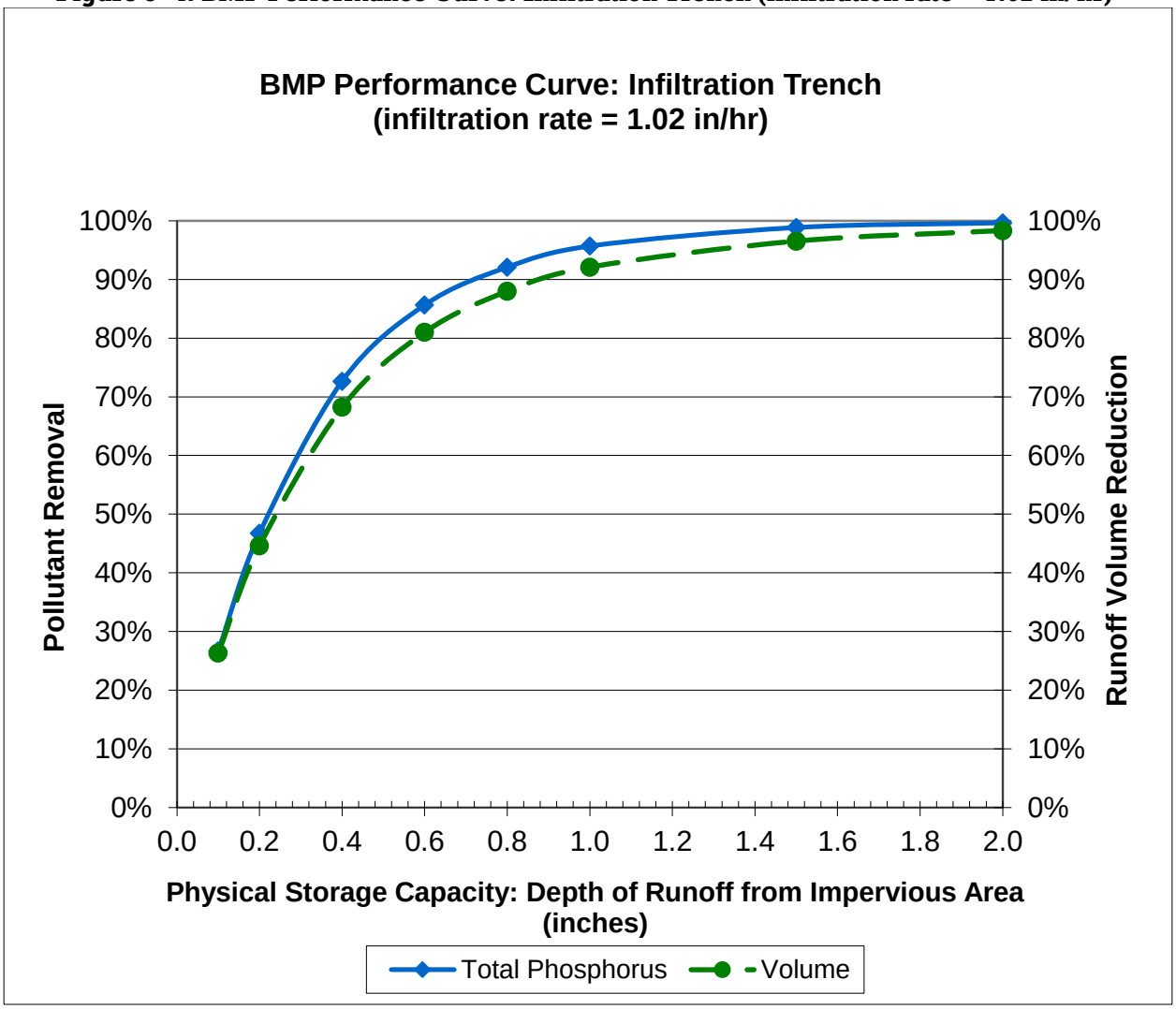


Table 3- 8: Infiltration Trench (IR = 2.41 in/hr) BMP Performance Table

Infiltration Trench (IR = 2.41 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	34.0%	54.7%	78.3%	88.4%	93.4%	96.0%	98.8%	99.8%
Cumulative Phosphorus Load Reduction	33%	55%	81%	91%	96%	98%	100%	100%

Figure 3- 5: BMP Performance Curve: Infiltration Trench (infiltration rate = 2.41 in/hr)

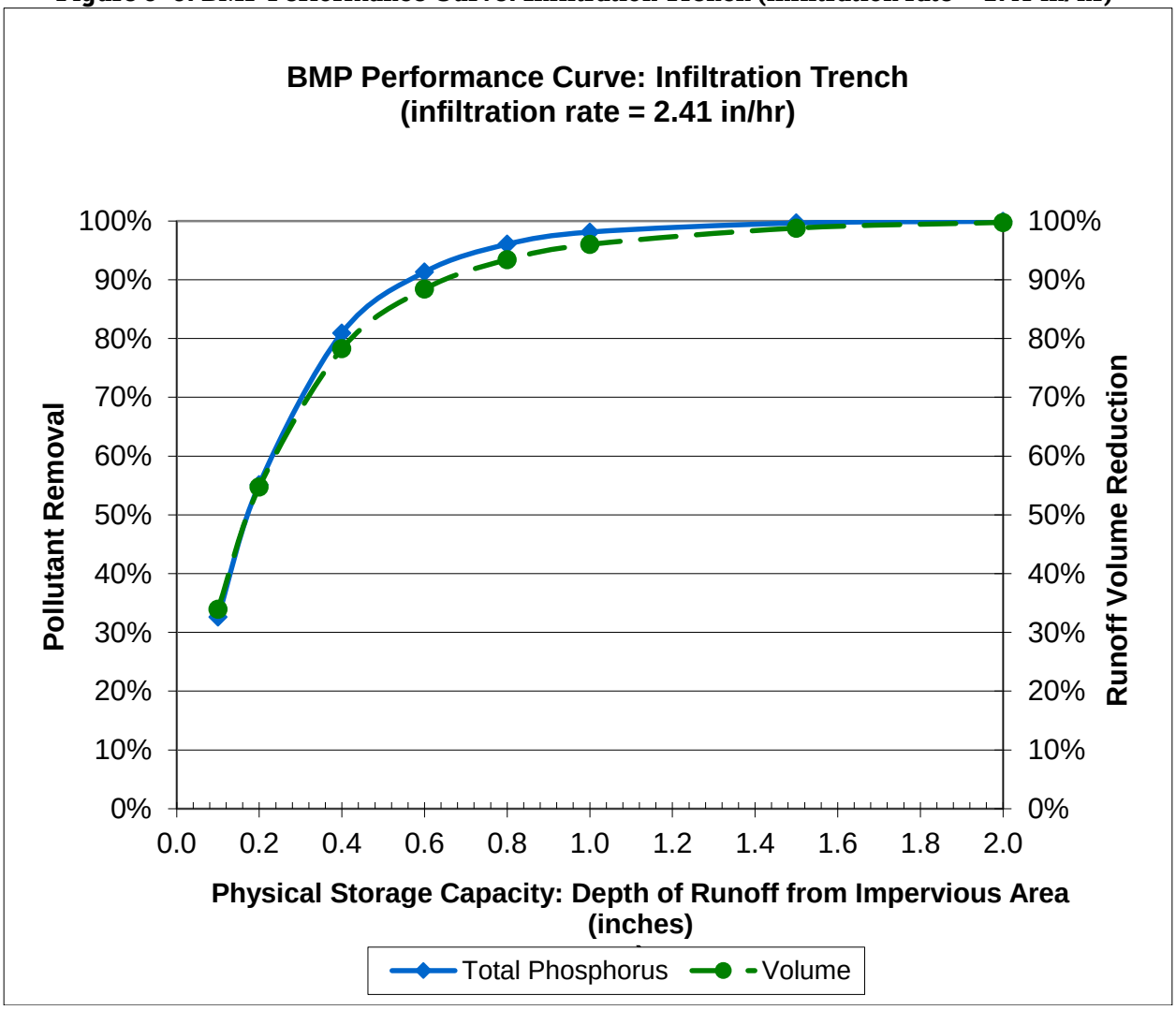


Table 3- 9: Infiltration Trench (8.27 in/hr) BMP Performance Table

Infiltration Trench (8.27 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	53.6%	76.1%	92.6%	97.2%	98.9%	99.5%	100.0%	100.0%
Cumulative Phosphorus Load Reduction	50%	75%	94%	98%	99%	100%	100%	100%

Figure 3- 6: BMP Performance Curve: Infiltration Trench (infiltration rate = 8.27 in/hr)

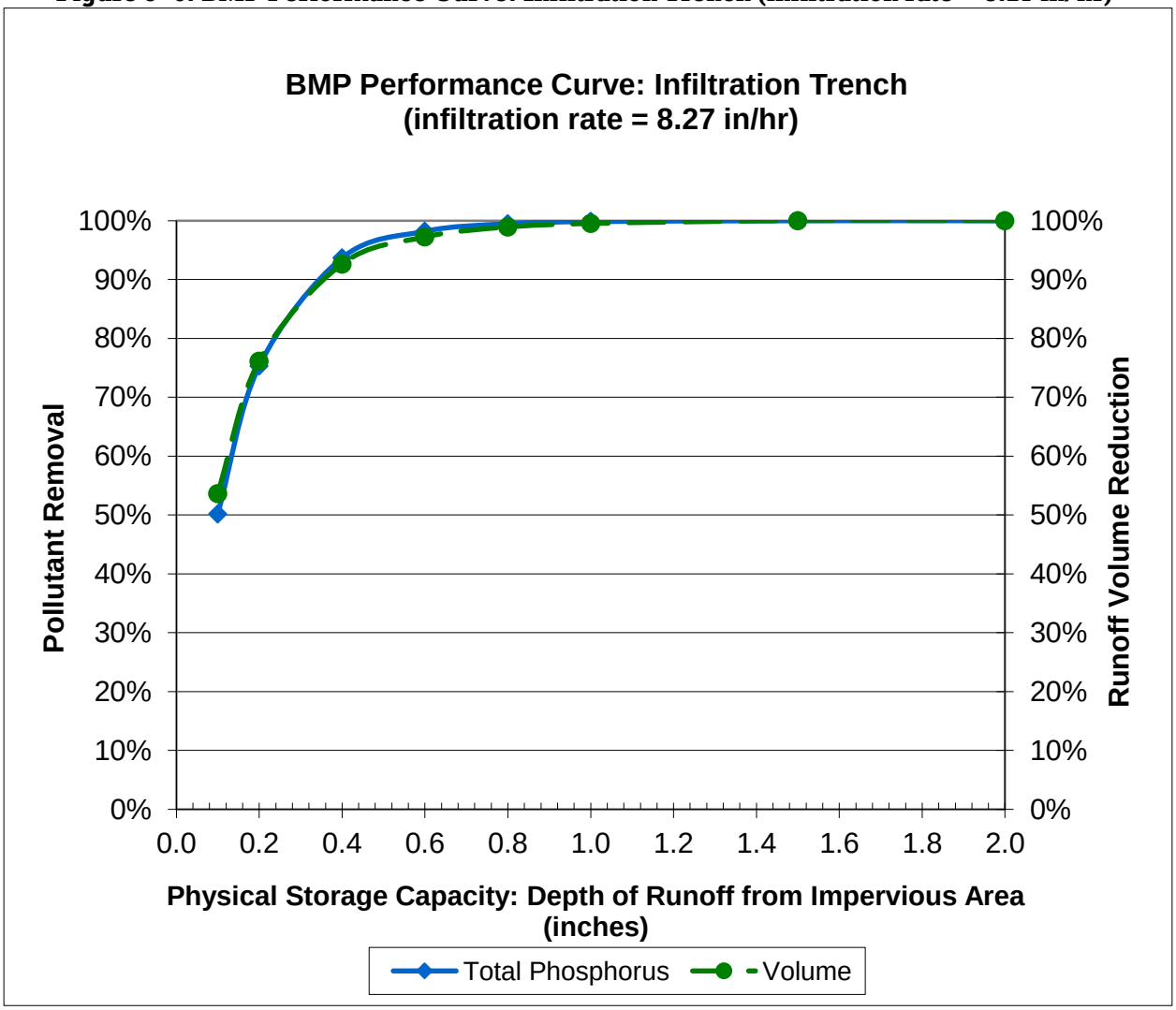


Table 3- 10: Infiltration Basin (0.17 in/hr) BMP Performance Table

Infiltration Basin (0.17 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	13.0%	24.6%	44.2%	59.5%	70.6%	78.1%	89.2%	93.9%
Cumulative Phosphorus Load Reduction	35%	52%	72%	82%	88%	92%	97%	99%

Figure 3- 7: BMP Performance Curve: Infiltration Basin (infiltration rate = 0.17 in/hr)

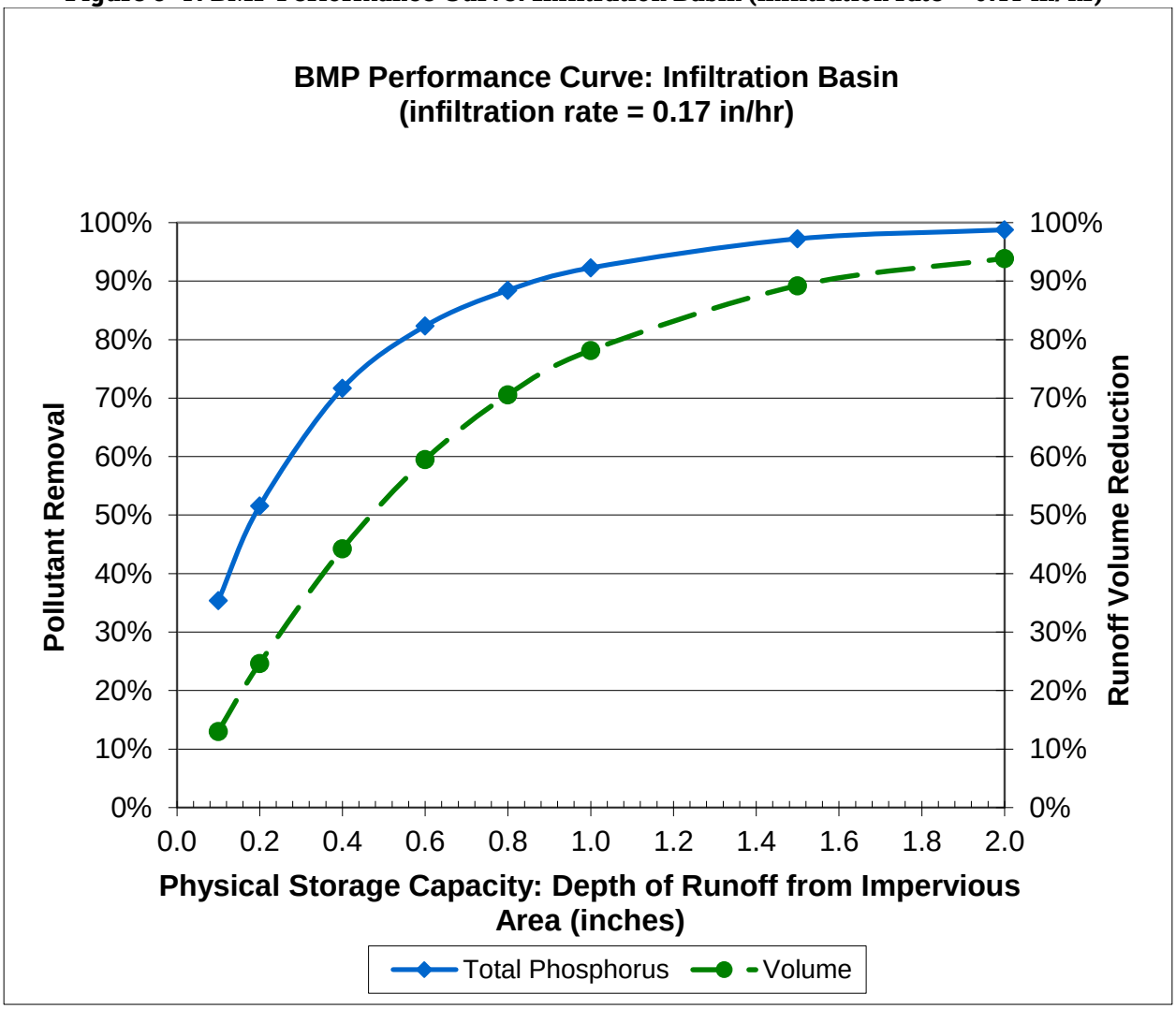


Table 3- 11: Infiltration Basin (0.27 in/hr) BMP Performance Table

Infiltration Basin (0.27 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	16.3%	29.8%	51.0%	66.0%	76.0%	82.4%	91.5%	95.2%
Cumulative Phosphorus Load Reduction	37%	54%	74 %	85%	90%	93%	98%	99%

Figure 3- 8: BMP Performance Curve: Infiltration Basin (infiltration rate = 0.27 in/hr)

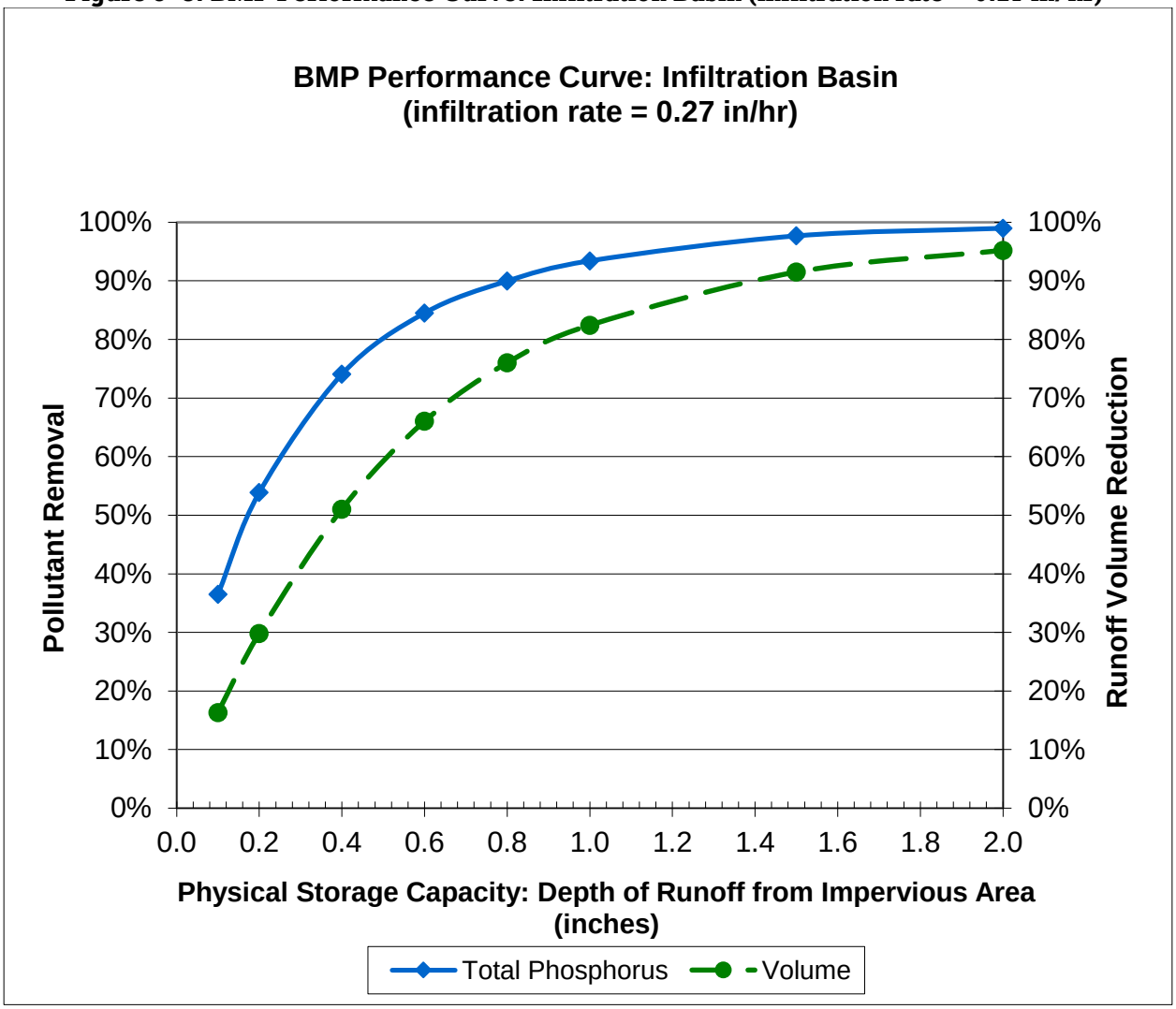


Table 3- 12: Infiltration Basin (0.52 in/hr) BMP Performance Table

Infiltration Basin (0.52 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	20.2%	35.6%	58.0%	72.6%	81.3%	86.9%	94.2%	96.7%
Cumulative Phosphorus Load Reduction	38%	56%	77%	87%	92%	95%	98%	99%

Figure 3- 9: BMP Performance Curve: Infiltration Basin (infiltration rate = 0.52 in/hr)

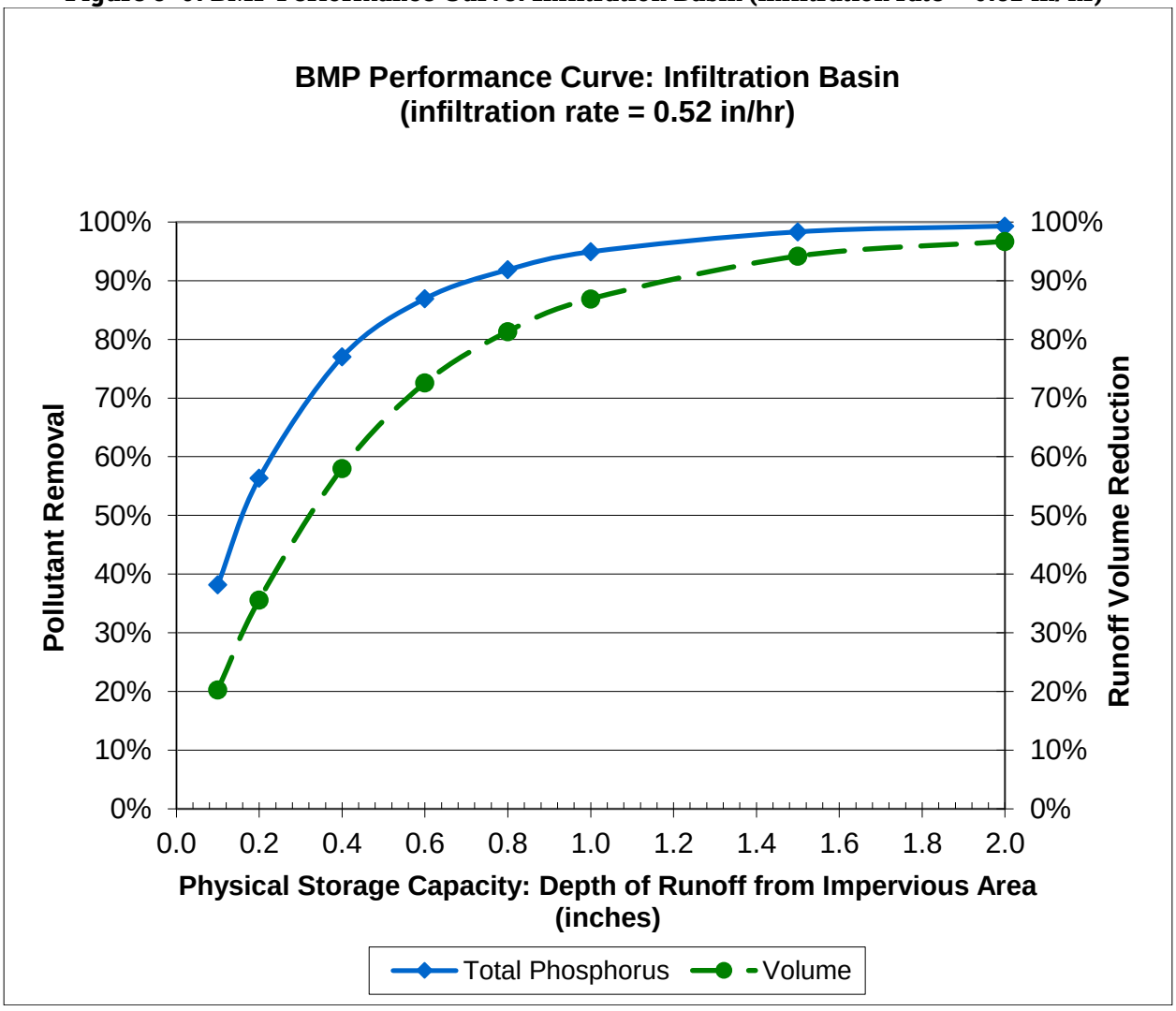


Table 3- 13: Infiltration Basin (1.02 in/hr) BMP Performance Table

Infiltration Basin (1.02 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	24.5%	42.0%	65.6%	79.4%	86.8%	91.3%	96.2%	98.1%
Cumulative Phosphorus Load Reduction	41%	60%	81%	90%	94%	97%	99%	100%

Figure 3- 10: BMP Performance Curve: Infiltration Basin (Soil infiltration rate = 1.02 in/hr)

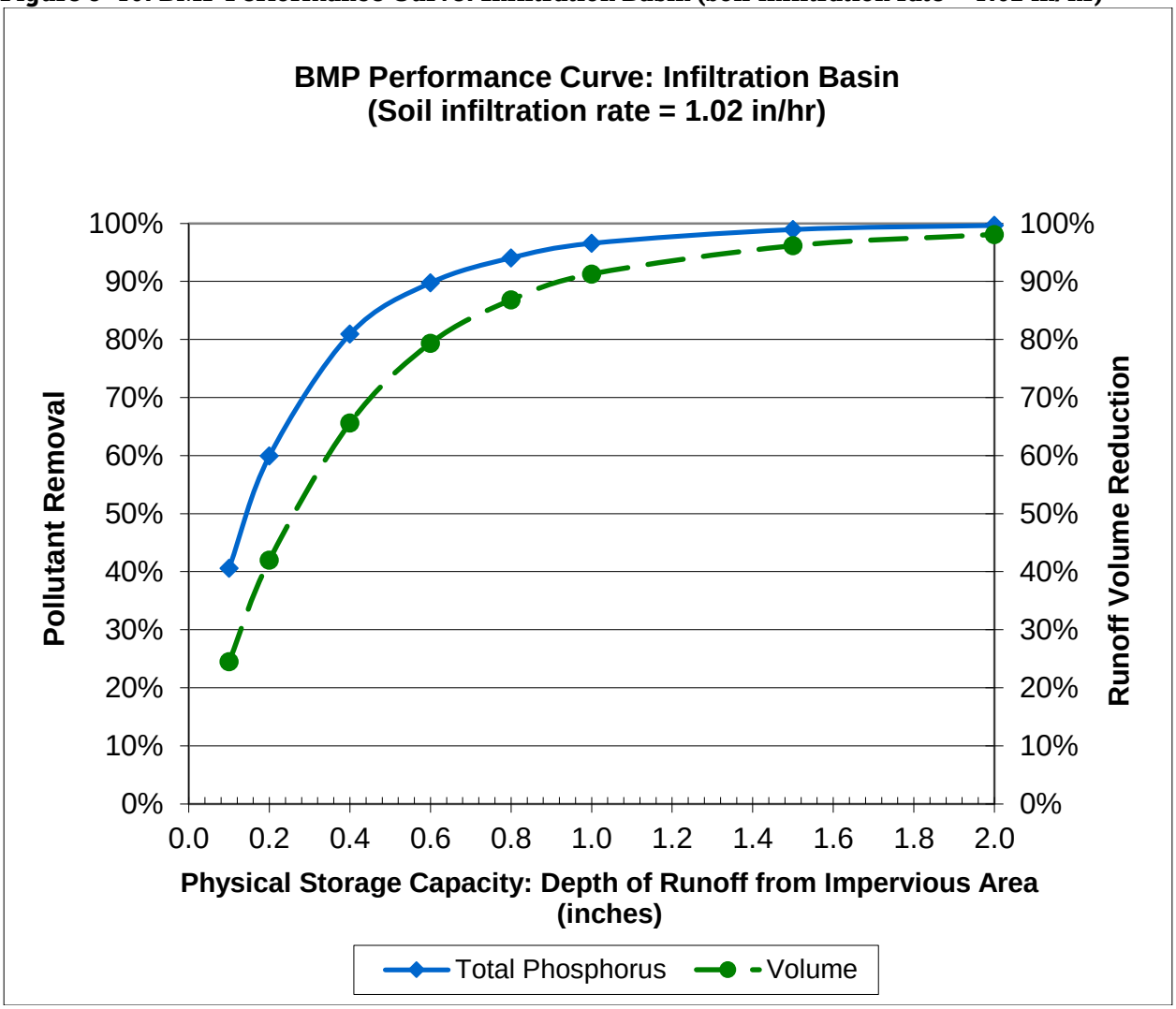


Table 3- 14: Infiltration Basin (2.41 in/hr) BMP Performance Table

Infiltration Basin (2.41 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	32.8%	53.8%	77.8%	88.4%	93.4%	96.0%	98.8%	99.8%
Cumulative Phosphorus Load Reduction	46%	67%	87%	94%	97%	98%	100%	100%

Figure 3- 11: BMP Performance Curve: Infiltration Basin (infiltration rate = 2.41 in/hr)

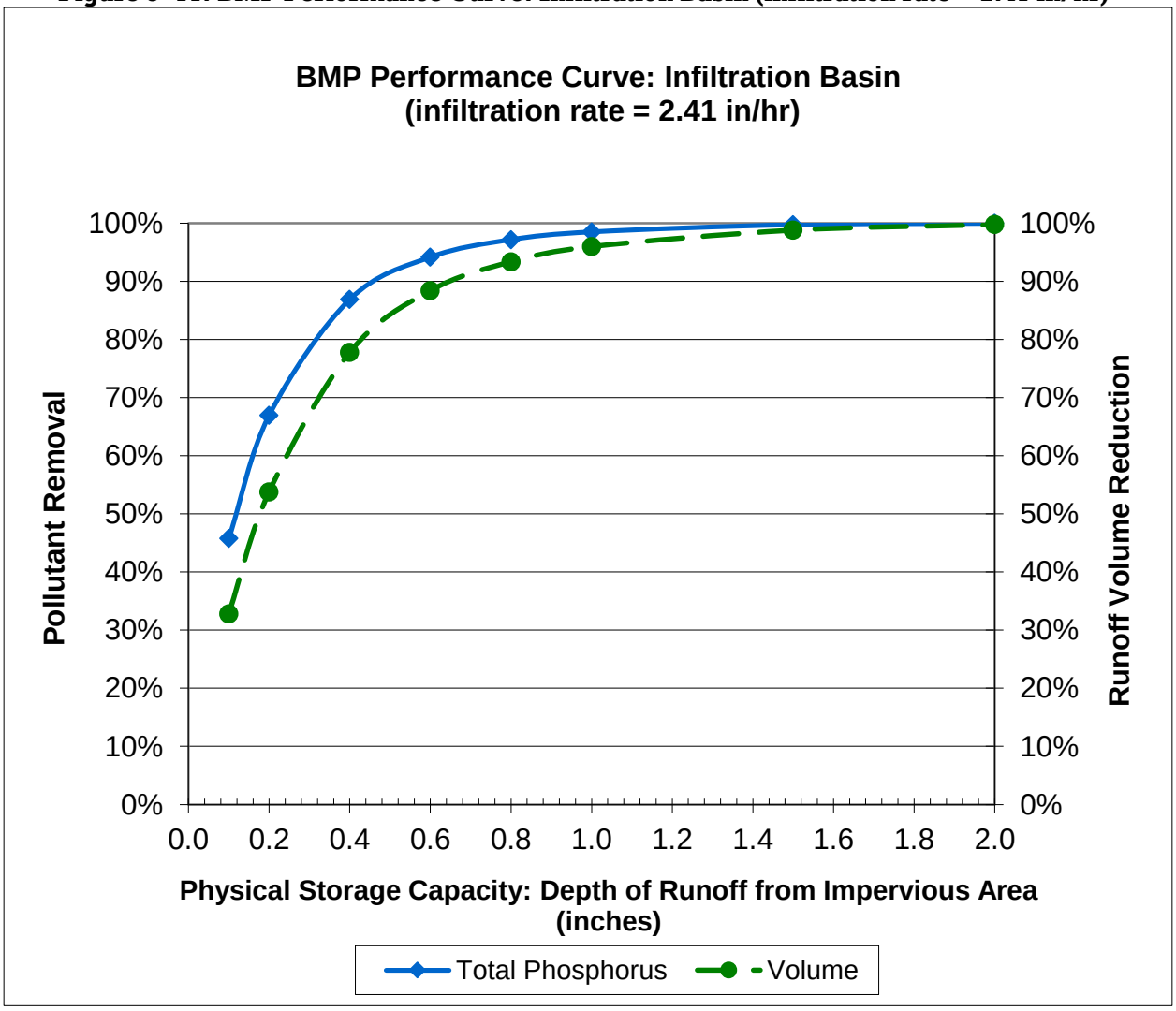


Table 3- 15: Infiltration Basin (8.27 in/hr) BMP Performance Table

Infiltration Basin (8.27 in/hr) BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Runoff Volume Reduction	54.6%	77.2%	93.4%	97.5%	99.0%	99.6%	100.0%	100.0%
Cumulative Phosphorus Load Reduction	59%	81%	96%	99%	100%	100%	100%	100%

Figure 3- 12: BMP Performance Curve: Infiltration Basin (infiltration rate = 8.27 in/hr)

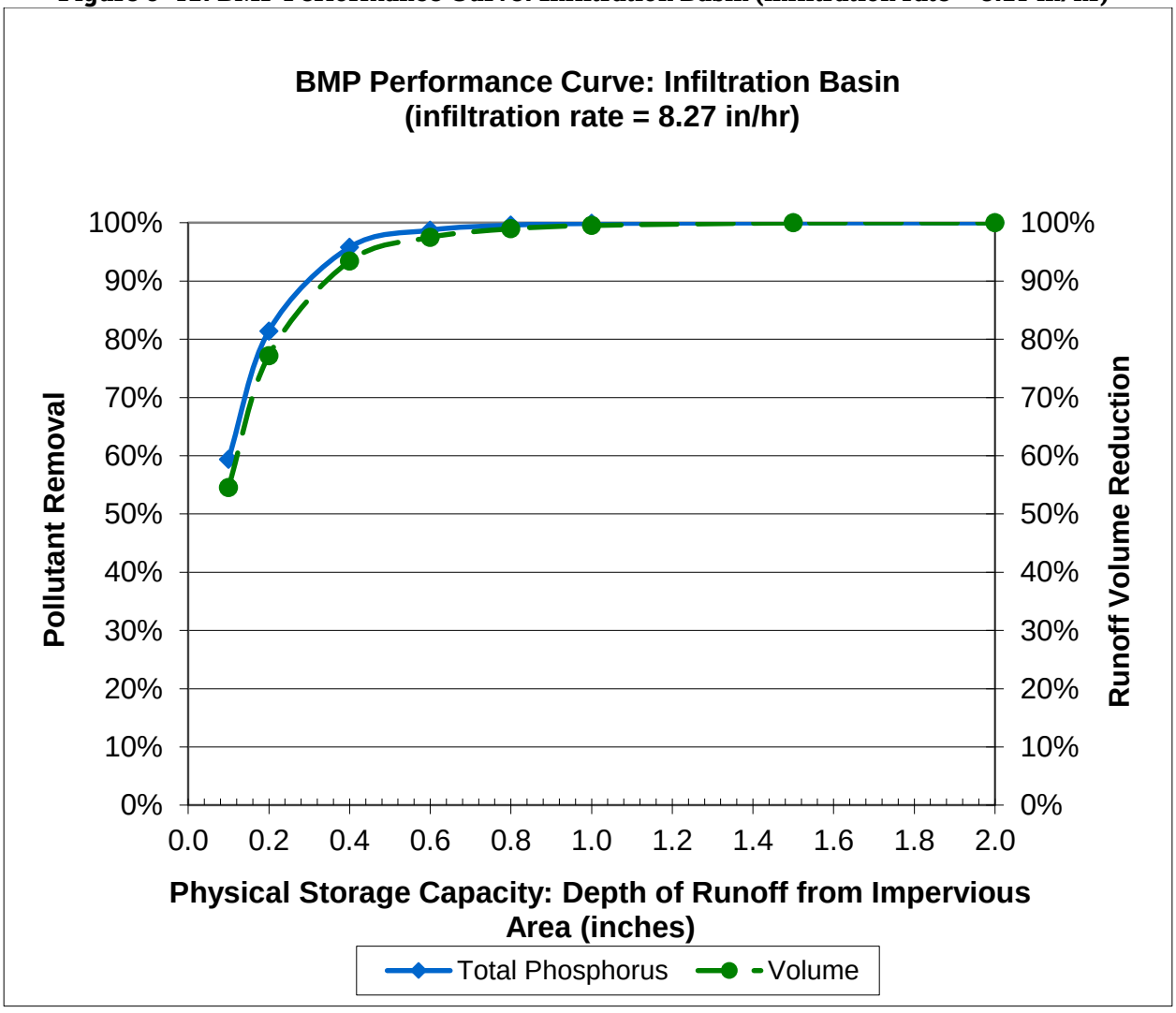


Table 3- 16: Biofiltration BMP Performance Table

Biofiltration BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	19%	34%	53%	64%	71%	76%	84%	89%

Figure 3- 13: BMP Performance Curve: Biofiltration

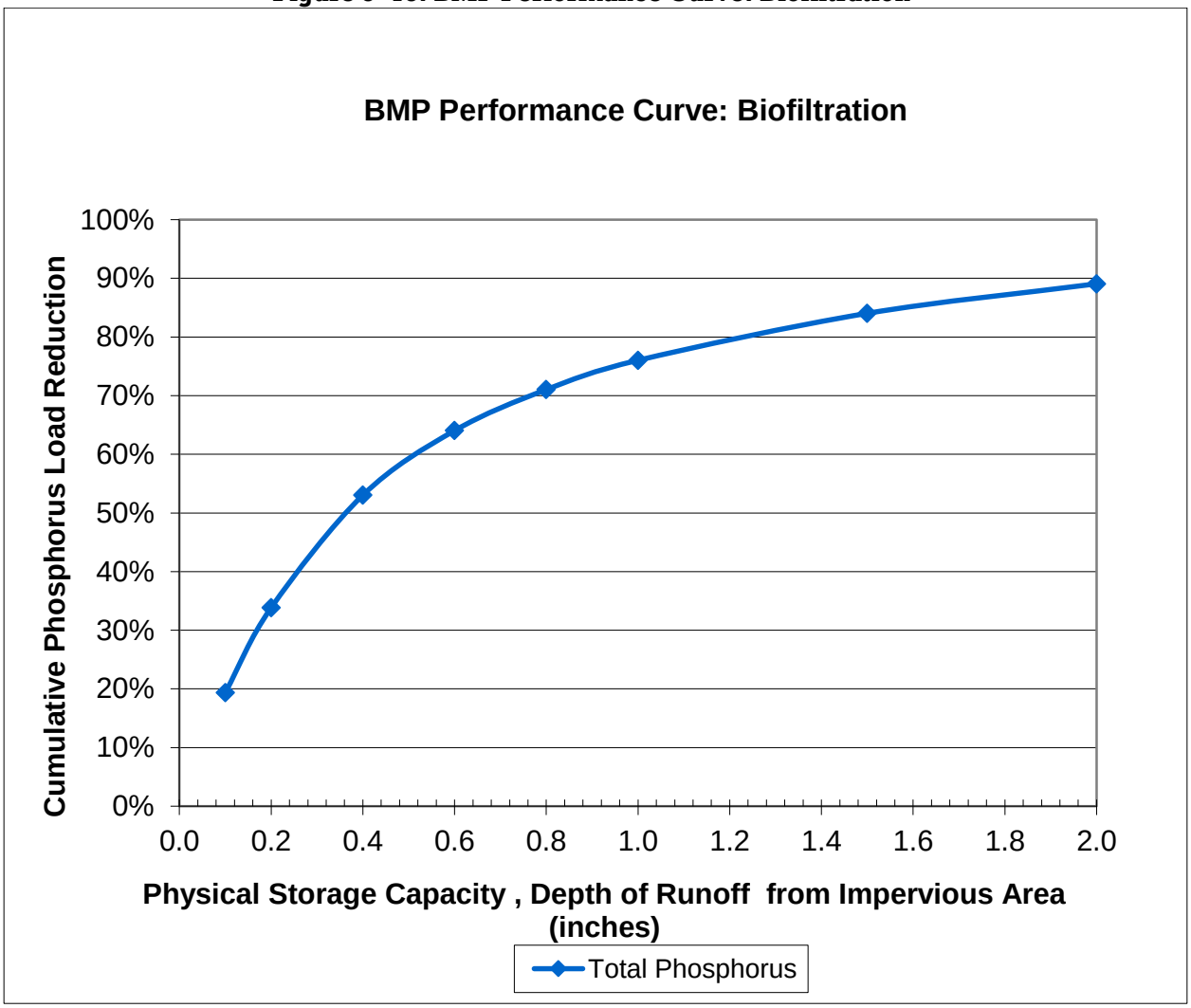


Table 3- 17: Gravel Wetland BMP Performance Table

Gravel Wetland BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	19%	26%	41%	51%	57%	61%	65%	66%

Figure 3- 14: BMP Performance Curve: Gravel Wetland

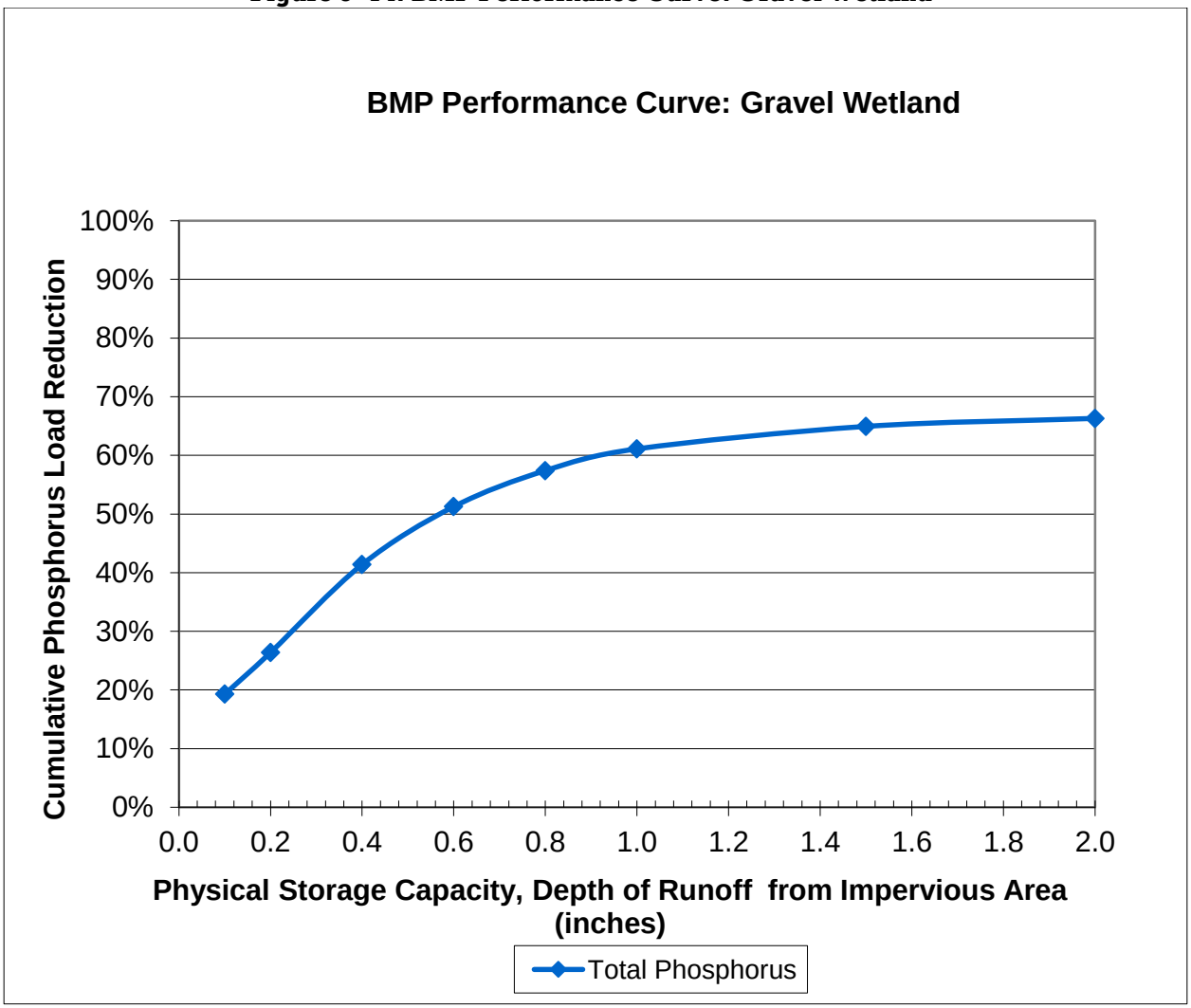


Table 3- 18: Porous Pavement BMP Performance Table

Porous Pavement BMP Performance Table: Long-Term Phosphorus Load Reduction				
BMP Capacity: Depth of Filter Course Area (inches)	12.0	18.0	24.0	32.0
Cumulative Phosphorus Load Reduction	62%	70%	75%	78%

Figure 3- 15: BMP Performance Curve: Porous Pavement

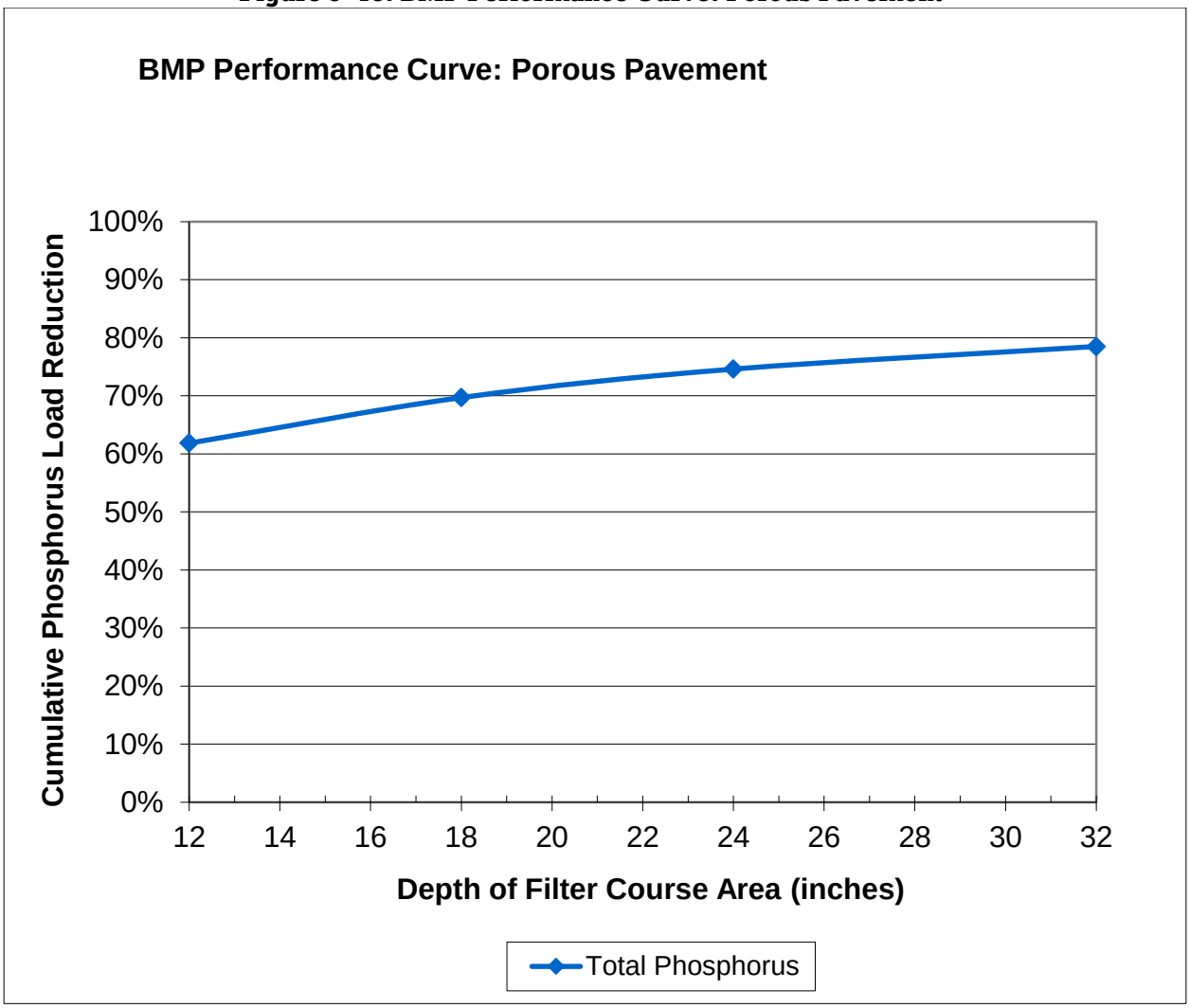


Table 3- 19: Wet Pond BMP Performance Table

Wet Pond BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	14%	25%	37%	44%	48%	53%	58%	63%

Table 3- 20: Dry Pond BMP Performance Table

Dry Pond BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	3%	6%	8%	9%	11%	12%	13%	14%

Figure 3- 16: BMP Performance Curve: Dry Pond

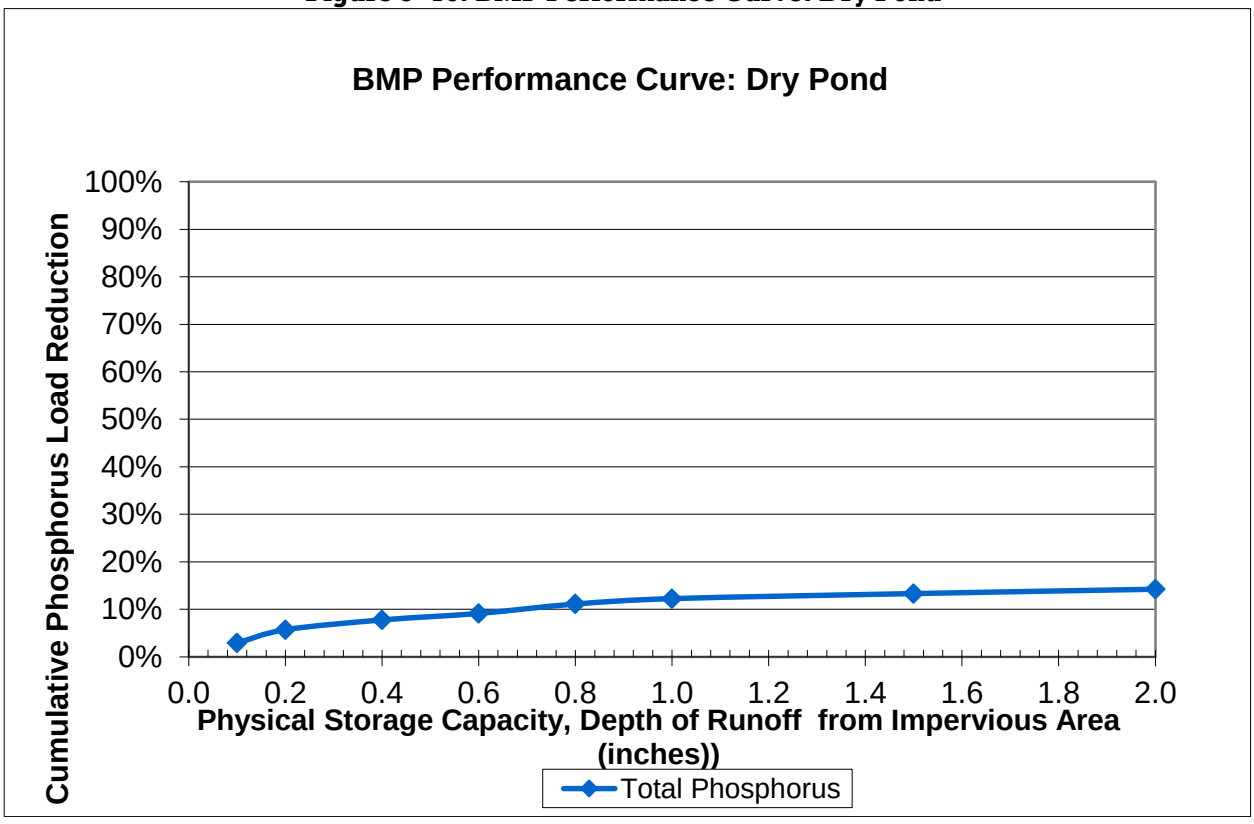


Table 3- 21: Grass Swale BMP Performance Table

Grass Swale BMP Performance Table: Long-Term Phosphorus Load Reduction								
BMP Capacity: Depth of Runoff Treated from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	2%	5%	9%	13%	17%	21%	29%	36%

Figure 3- 17: BMP Performance Curve: Grass Swale

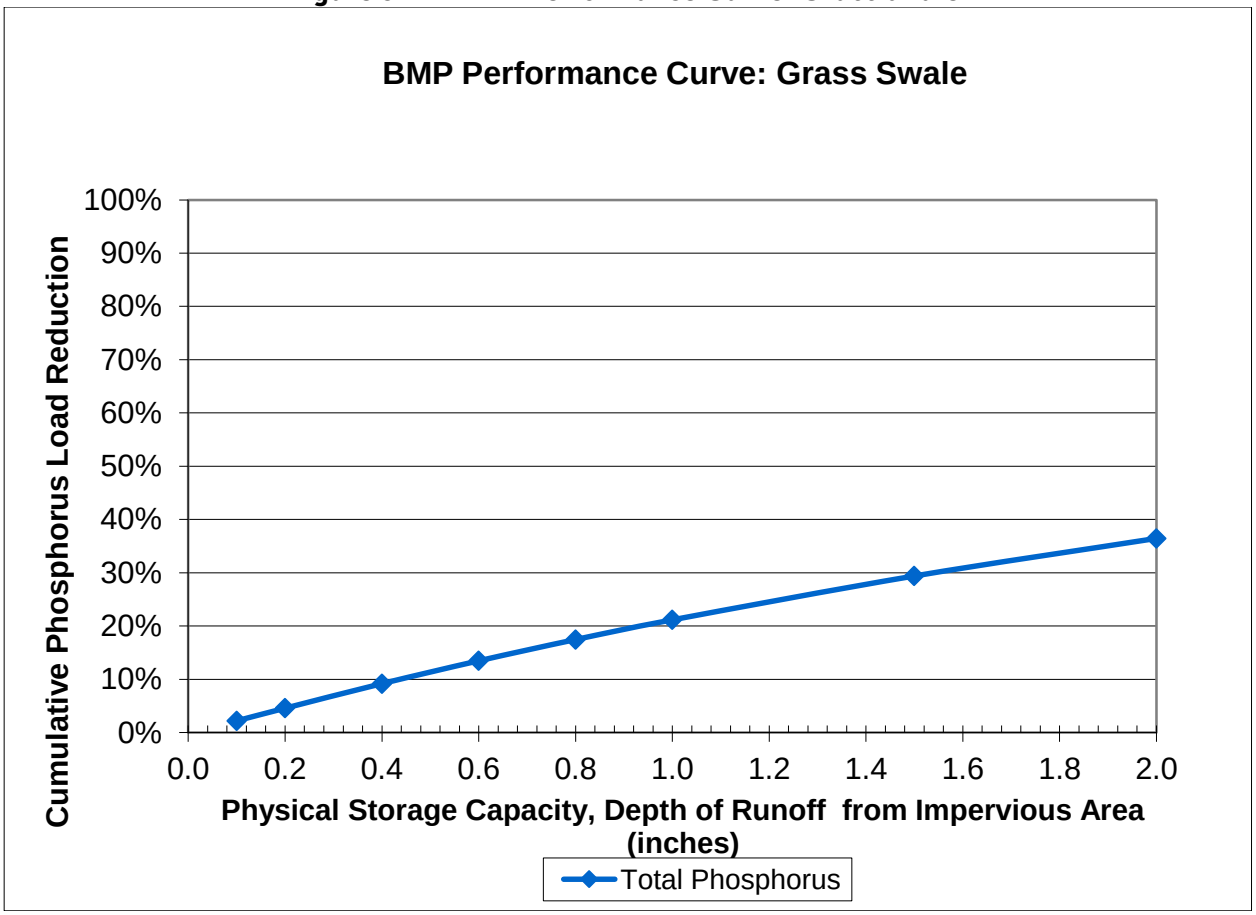


Table 3- 22: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1

Impervious Area Disconnection through Storage : Impervious Area to Pervious Area Ratio = 8:1												
Storage volume to impervious area ratio	Total Runoff Volume (TP) Reduction Percentages											
	HSG A			HSG B			HSG C			HSG D		
	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day
0.1 in	24%	23%	22%	24%	23%	22%	24%	23%	22%	22%	22%	21%
0.2 in	40%	38%	37%	40%	38%	37%	37%	38%	37%	24%	26%	27%
0.3 in	52%	50%	49%	52%	50%	49%	40%	46%	49%	24%	26%	27%
0.4 in	61%	59%	58%	59%	59%	58%	40%	48%	54%	24%	26%	27%
0.5 in	67%	66%	64%	62%	66%	64%	40%	48%	56%	24%	26%	27%
0.6 in	70%	71%	70%	62%	70%	70%	40%	48%	56%	24%	26%	27%
0.8 in	71%	78%	77%	62%	73%	77%	40%	48%	56%	24%	26%	27%
1.0 in	71%	80%	80%	62%	73%	79%	40%	48%	56%	24%	26%	27%
1.5 in	71%	81%	87%	62%	73%	81%	40%	48%	56%	24%	26%	27%
2.0 in	71%	81%	88%	62%	73%	81%	40%	48%	56%	24%	26%	27%

Figure 3- 18: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1 for HSG A Soils

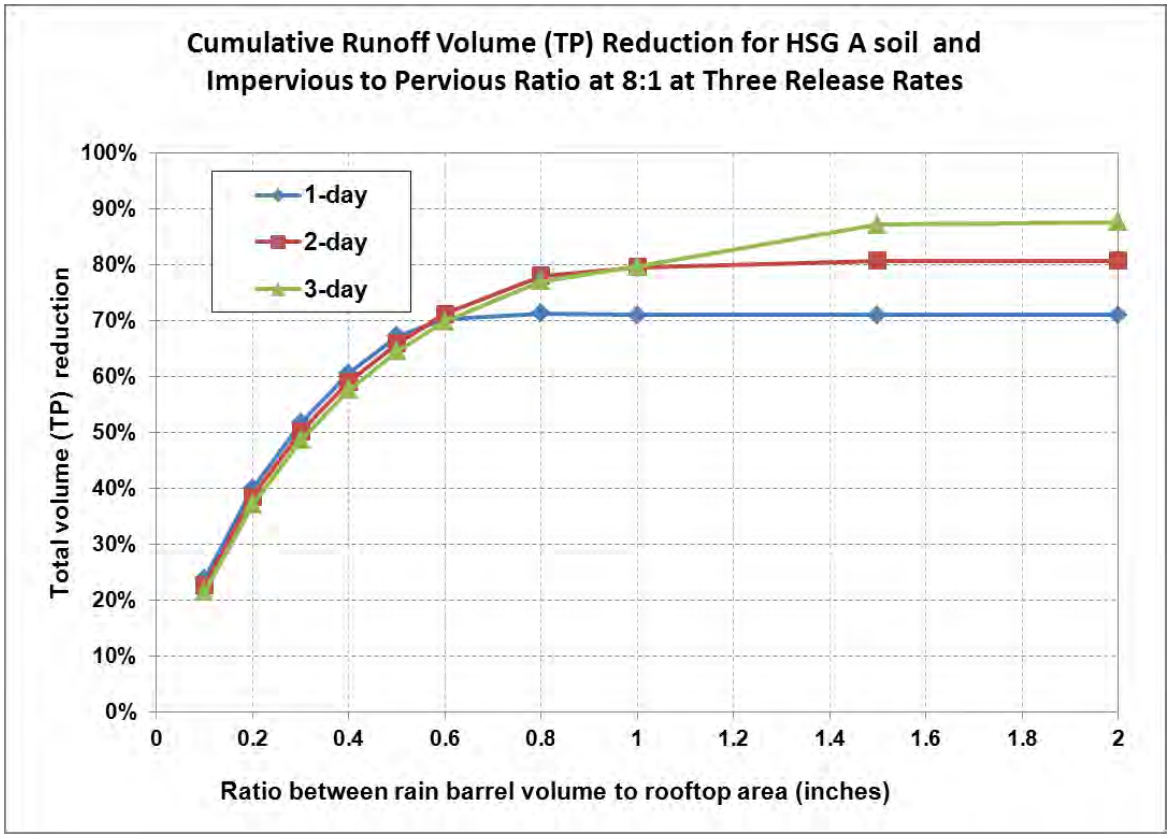


Figure 3- 19: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1 for HSG B Soils

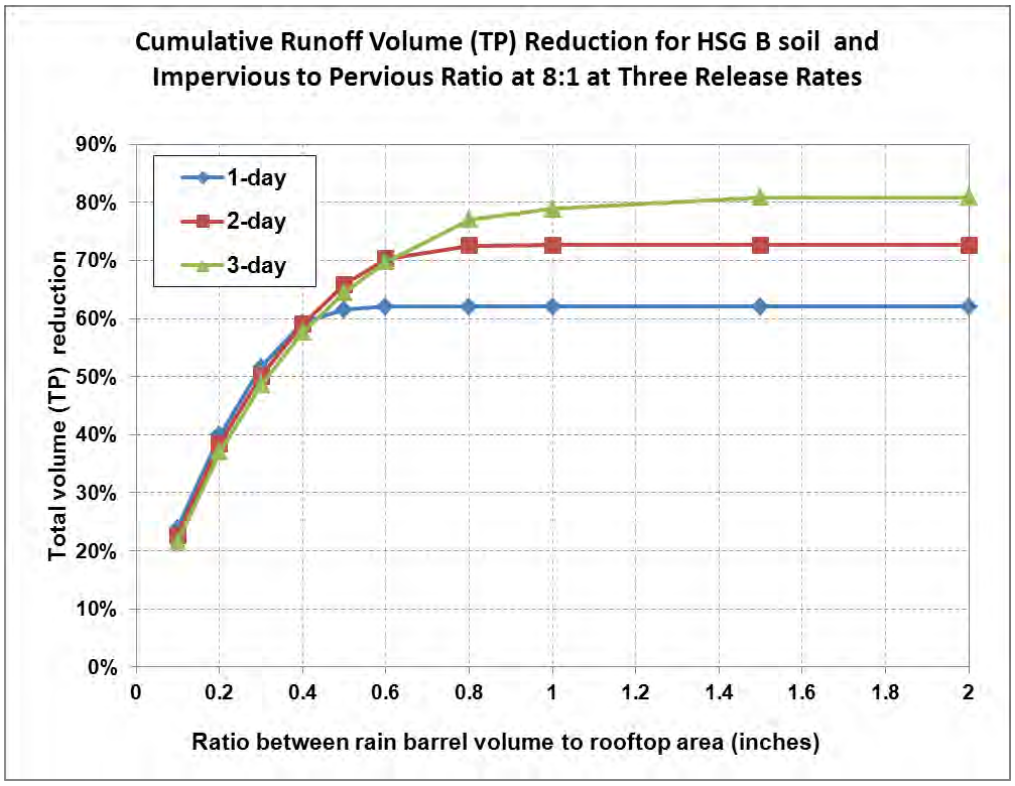


Figure 3- 20: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1 for HSG C Soils

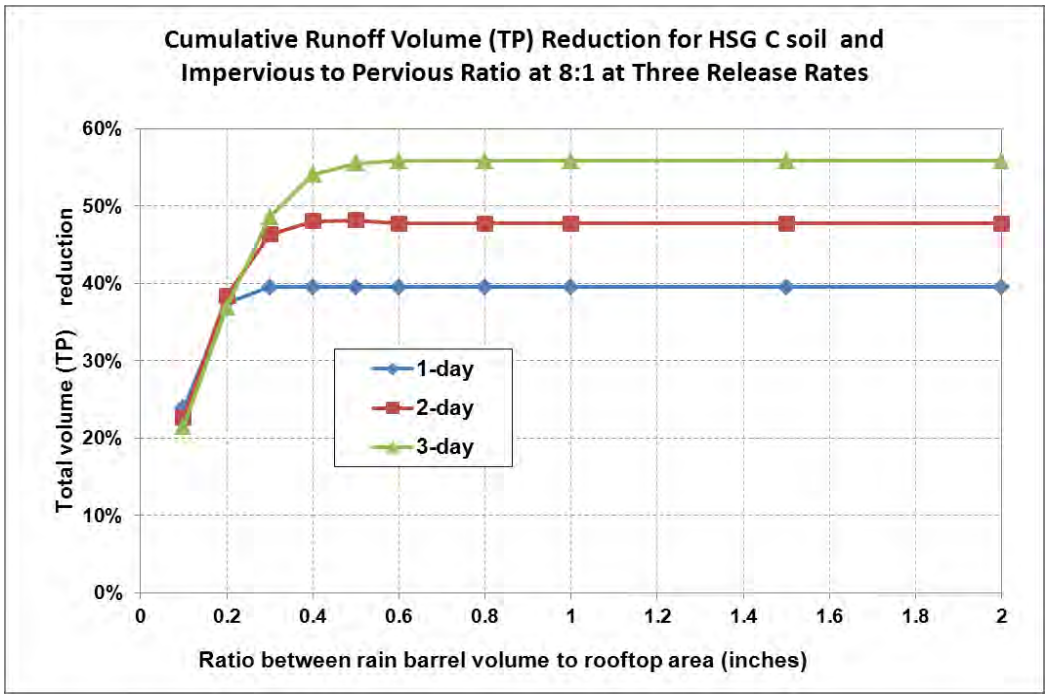


Figure 3- 21: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 8:1 for HSG D Soils

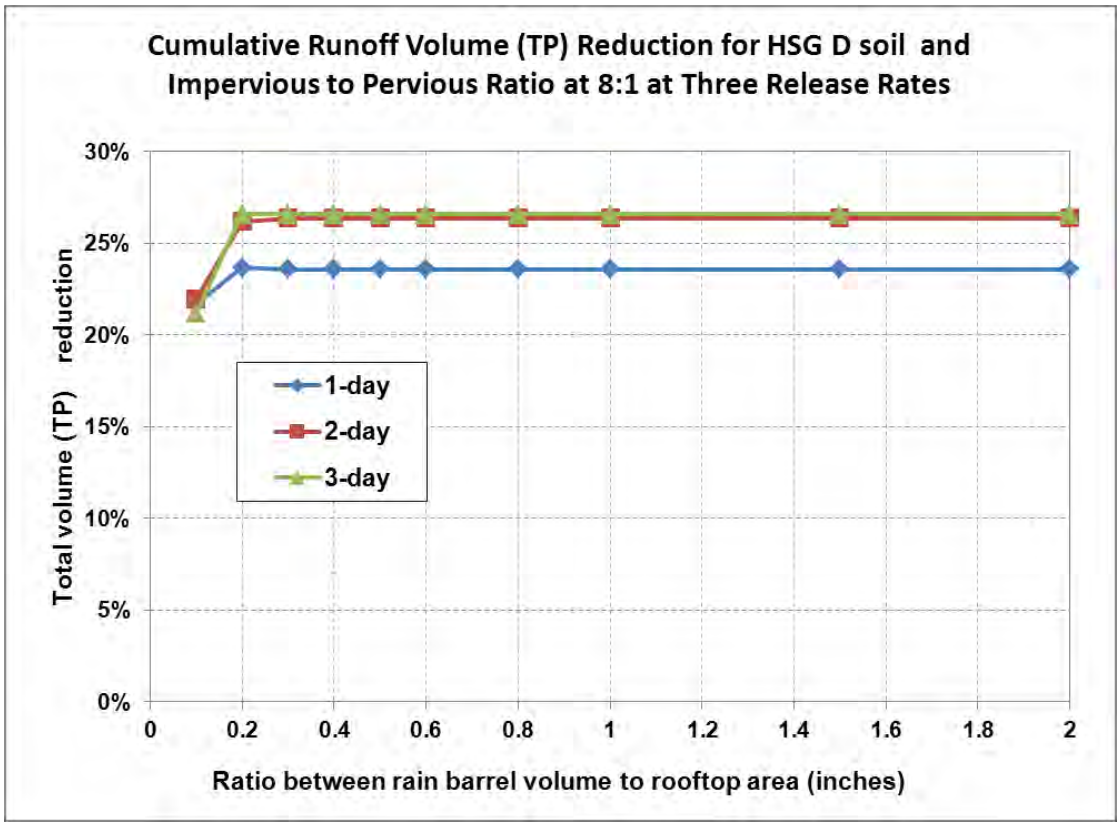


Table 3- 23: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1

Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1												
Rain barrel volume to impervious area ratio	Total Runoff Volume and Phosphorus Load (TP) Reduction Percentages											
	HSG A			HSG B			HSG C			HSG D		
	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day
0.1 in	24%	23%	22%	24%	23%	22%	24%	23%	22%	23%	23%	22%
0.2 in	40%	38%	37%	40%	38%	37%	40%	38%	37%	28%	30%	33%
0.3 in	52%	50%	49%	52%	50%	49%	47%	50%	49%	29%	31%	34%
0.4 in	61%	59%	58%	61%	59%	58%	48%	55%	58%	29%	31%	34%
0.5 in	67%	66%	64%	67%	66%	64%	48%	57%	63%	29%	31%	34%
0.6 in	73%	71%	70%	70%	71%	70%	48%	57%	65%	29%	31%	34%
0.8 in	78%	78%	77%	71%	78%	77%	48%	57%	66%	29%	31%	34%
1.0 in	79%	81%	80%	71%	79%	80%	48%	57%	66%	29%	31%	34%
1.5 in	79%	87%	88%	71%	80%	87%	48%	57%	66%	29%	31%	34%
2.0 in	79%	87%	91%	71%	80%	87%	48%	57%	66%	29%	31%	34%

Figure 3- 22: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1 for HSG A Soils

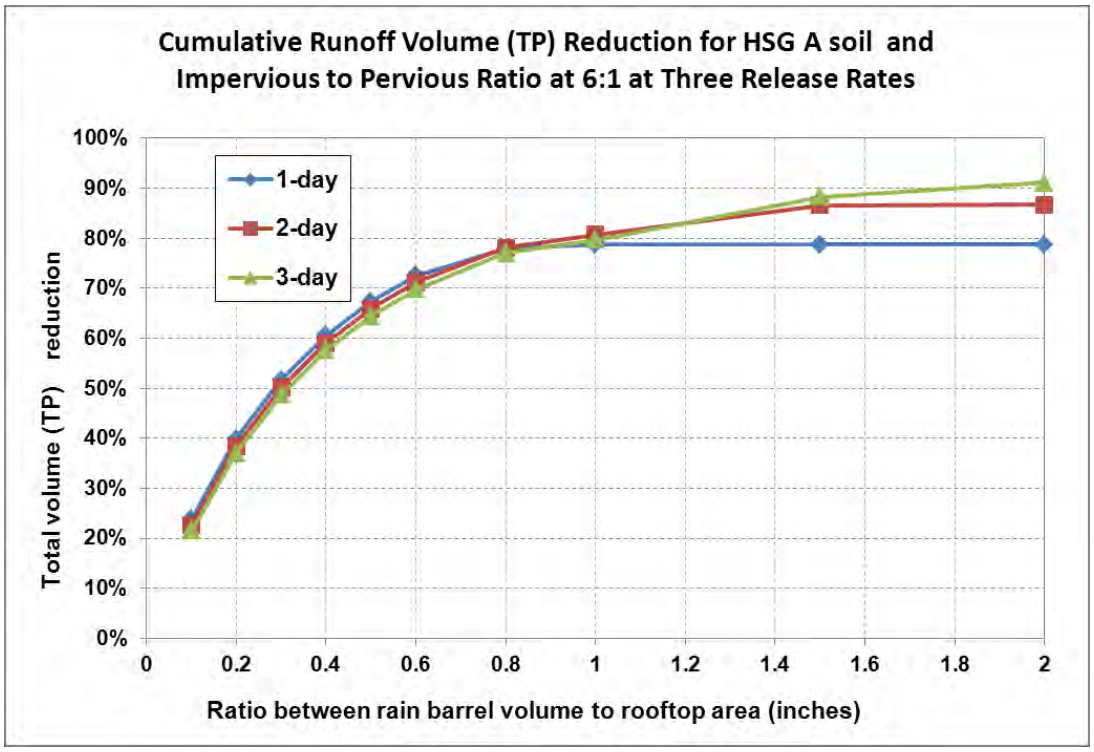


Figure 3- 23: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1 for HSG B Soils

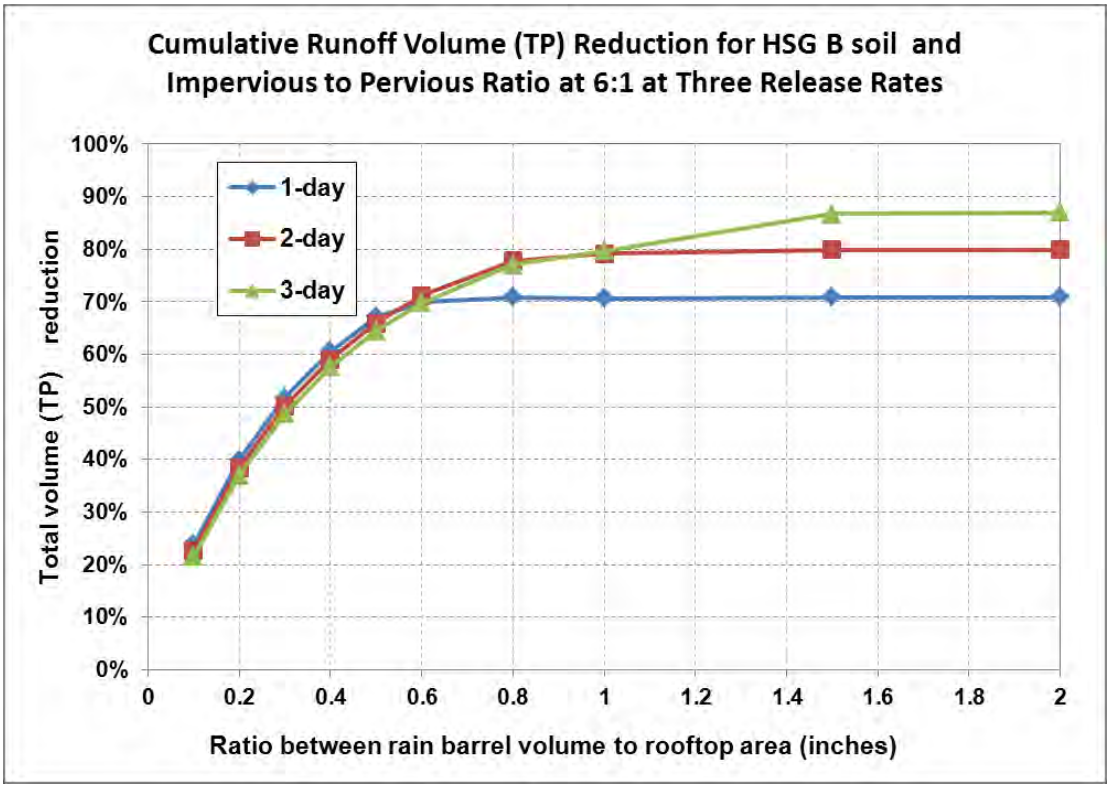


Figure 3- 24: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1 for HSG C Soils

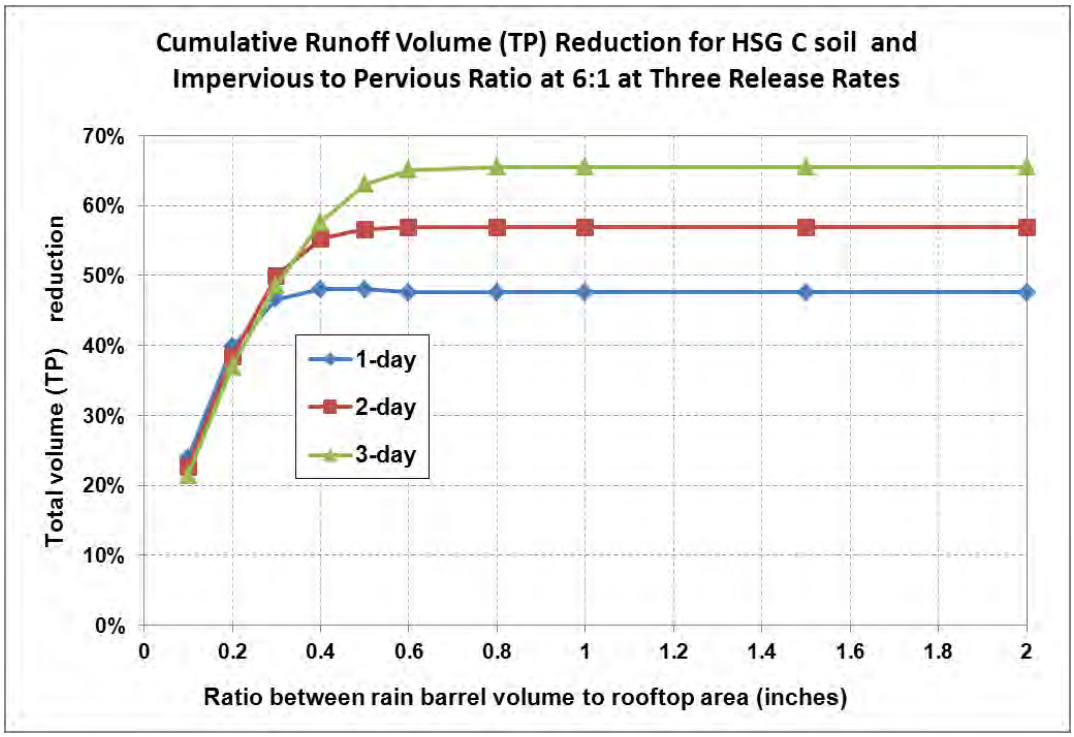


Figure 3- 25: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 6:1 for HSG D Soils

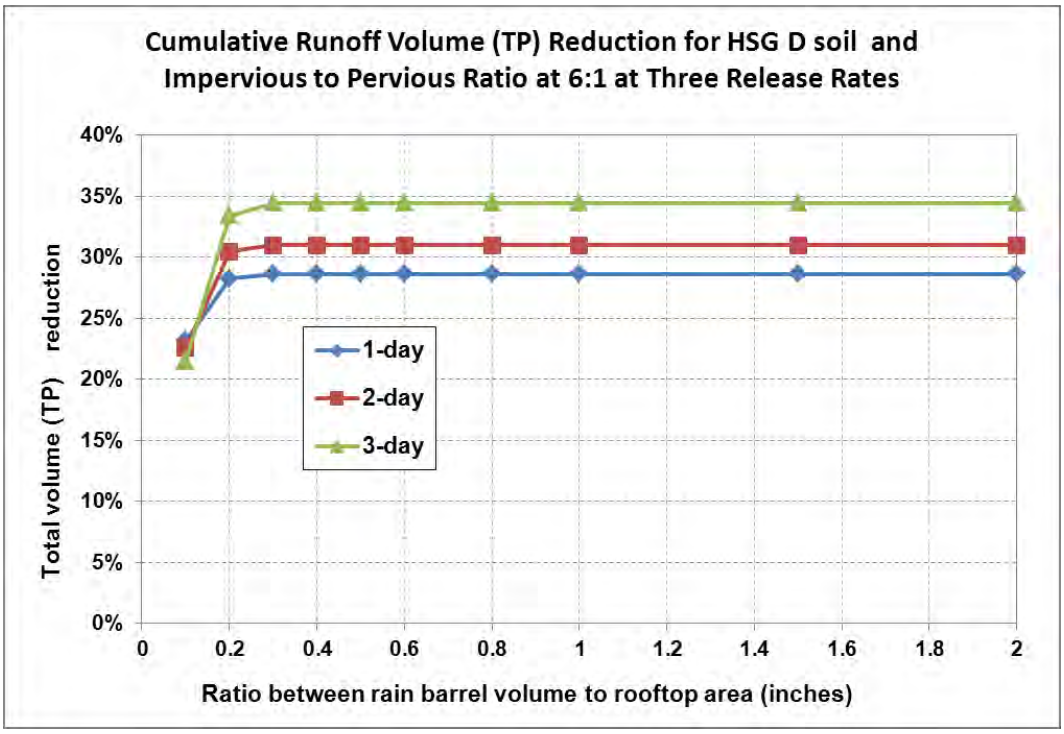


Table 3- 24: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1

Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1												
Storage volume to impervious area ratio	Total Runoff Volume and Phosphorus Load (TP) Reduction Percentages											
	HSG A			HSG B			HSG C			HSG D		
	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day
0.1 in	24%	23%	22%	24%	23%	22%	24%	23%	22%	24%	23%	22%
0.2 in	40%	38%	37%	40%	38%	37%	40%	38%	37%	37%	37%	37%
0.3 in	52%	50%	49%	52%	50%	49%	52%	50%	49%	39%	42%	45%
0.4 in	61%	59%	58%	61%	59%	58%	58%	59%	58%	39%	42%	47%
0.5 in	67%	66%	64%	67%	66%	64%	60%	65%	64%	40%	42%	47%
0.6 in	73%	71%	70%	73%	71%	70%	61%	68%	70%	40%	42%	47%
0.8 in	79%	78%	77%	79%	78%	77%	61%	69%	75%	40%	42%	47%
1.0 in	82%	81%	80%	80%	81%	80%	61%	69%	76%	40%	42%	47%
1.5 in	87%	89%	88%	80%	87%	88%	61%	69%	76%	40%	42%	47%
2.0 in	87%	91%	91%	80%	88%	91%	61%	69%	76%	40%	42%	47%

Figure 3- 26: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1 for HSG A Soils

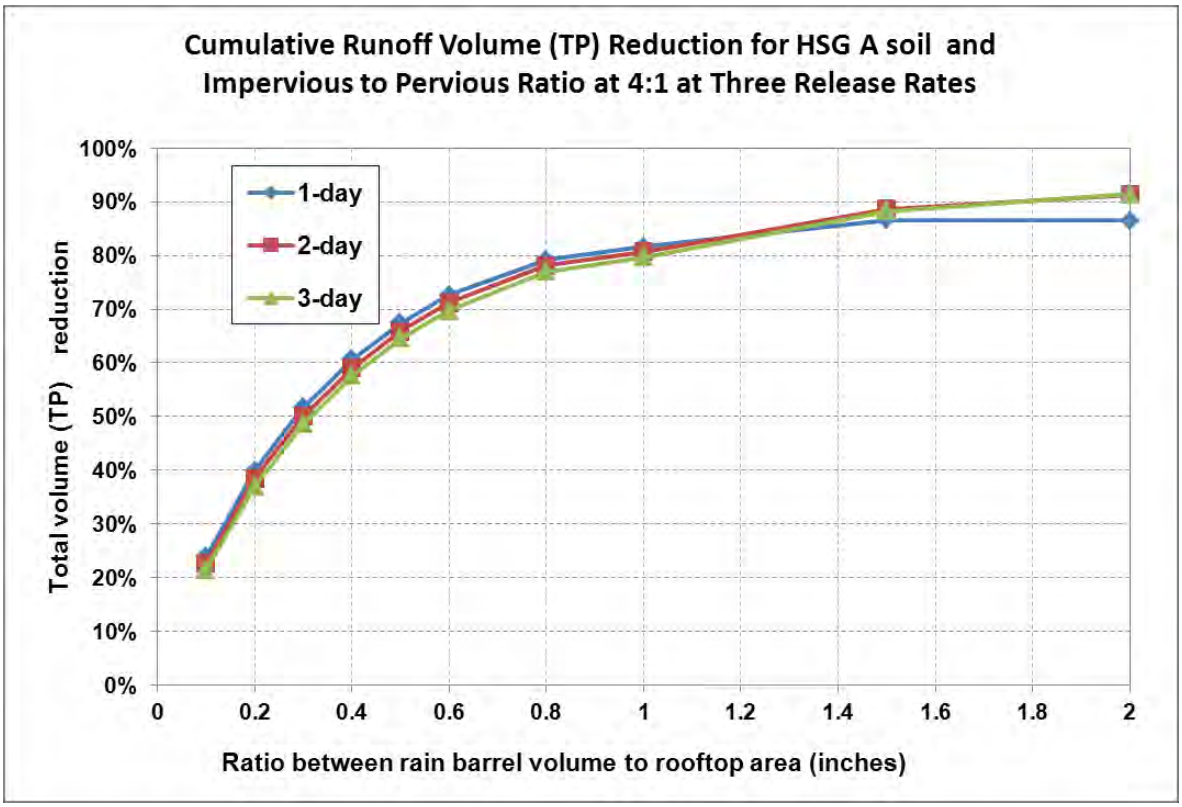


Figure 3- 27: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1 for HSG B Soils

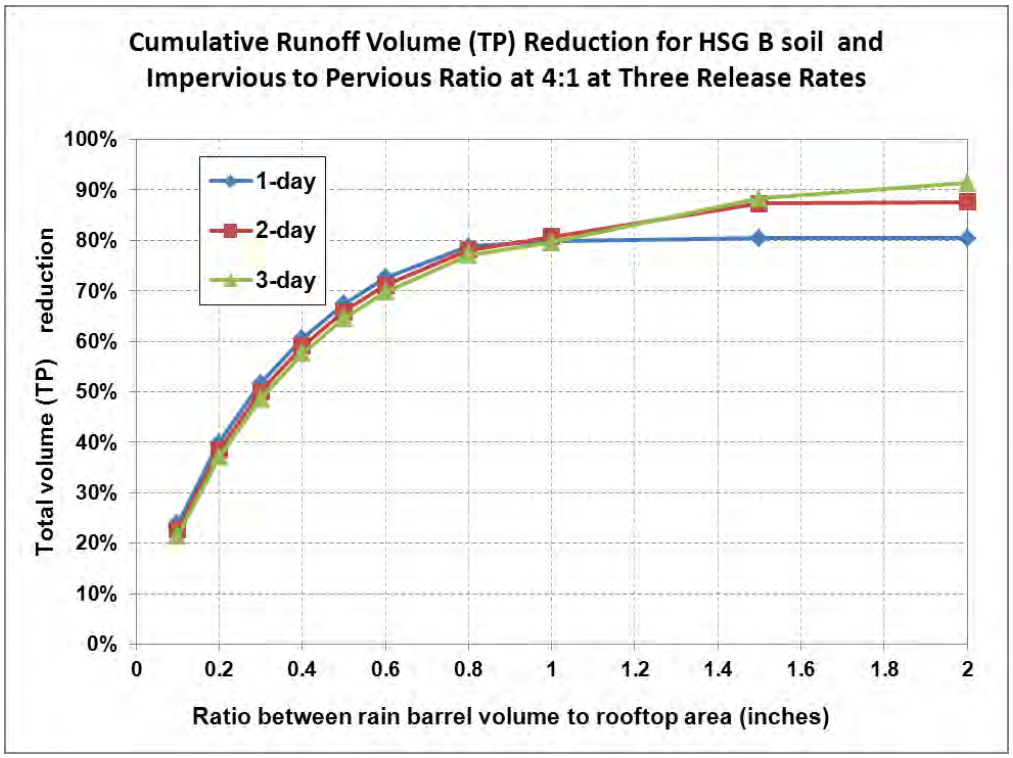


Figure 3- 28: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1 for HSG C Soils

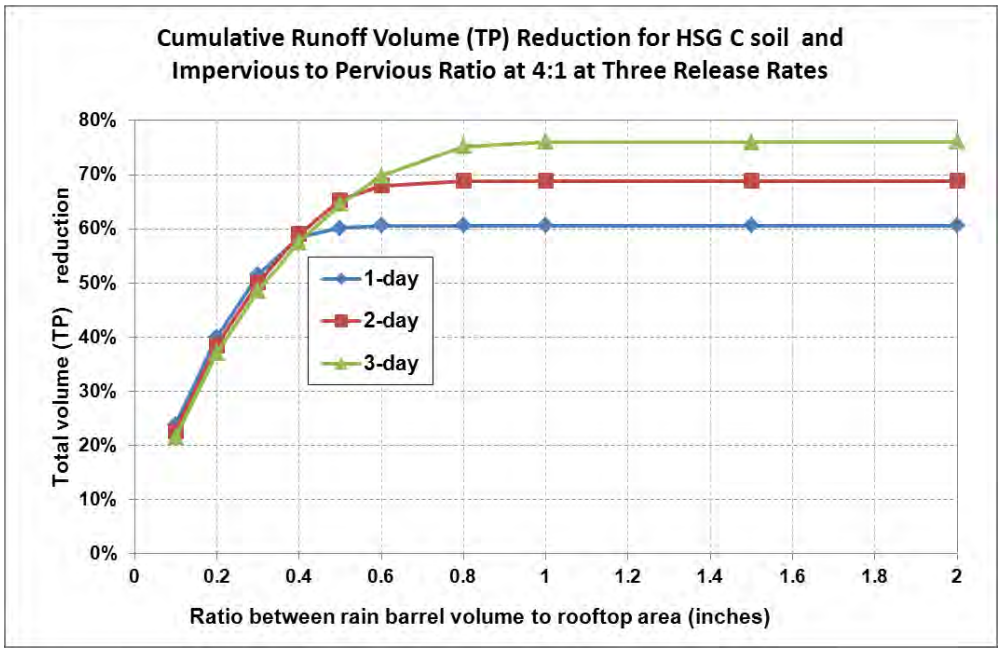


Figure 3- 29: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 4:1 for HSG D Soils

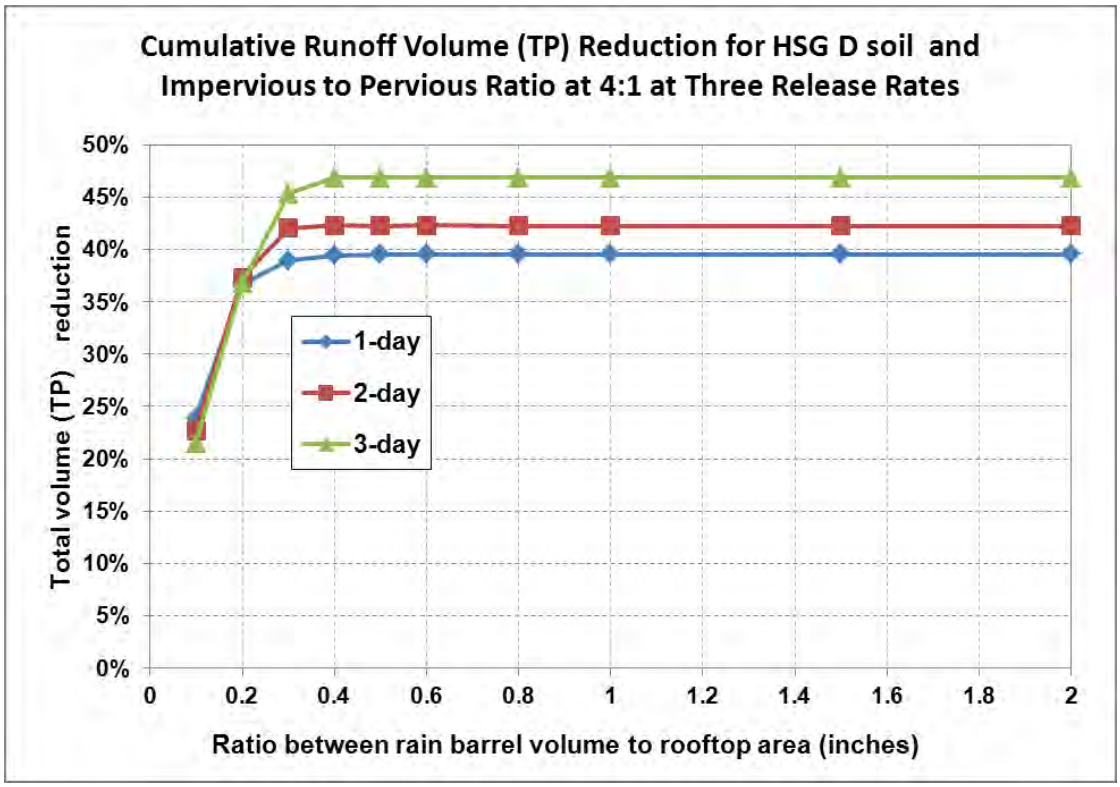


Table 3- 25: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 2:1

Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 2:1												
Storage volume to impervious area ratio	Total Runoff Volume and Phosphorus Load (TP) Reduction Percentages											
	HSG A			HSG B			HSG C			HSG D		
	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day
0.1 in	24%	23%	22%	24%	23%	22%	24%	23%	22%	24%	23%	22%
0.2 in	40%	38%	37%	40%	38%	37%	40%	38%	37%	40%	38%	37%
0.3 in	52%	50%	49%	52%	50%	49%	52%	50%	49%	51%	50%	49%
0.4 in	61%	59%	58%	61%	59%	58%	61%	59%	58%	57%	58%	57%
0.5 in	67%	66%	64%	67%	66%	64%	67%	66%	64%	59%	62%	63%
0.6 in	73%	71%	70%	73%	71%	70%	72%	71%	70%	59%	62%	67%
0.8 in	79%	78%	77%	79%	78%	77%	77%	78%	77%	59%	62%	67%
1.0 in	82%	81%	80%	82%	81%	80%	78%	81%	80%	59%	62%	67%
1.5 in	89%	89%	88%	89%	89%	88%	78%	84%	88%	59%	62%	67%
2.0 in	92%	92%	91%	91%	92%	91%	78%	84%	89%	59%	62%	67%

Figure 3- 30: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio= 2:1 for HSG A Soils

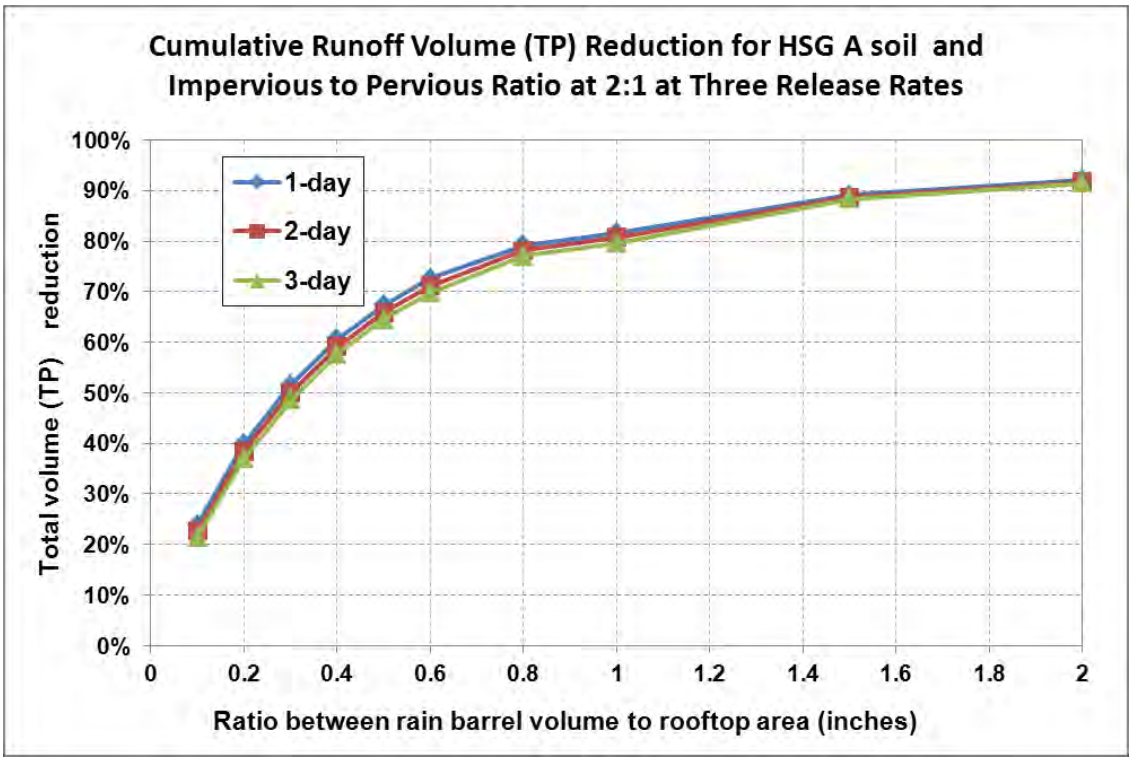


Figure 3- 31: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio= 2:1 for HSG B Soils

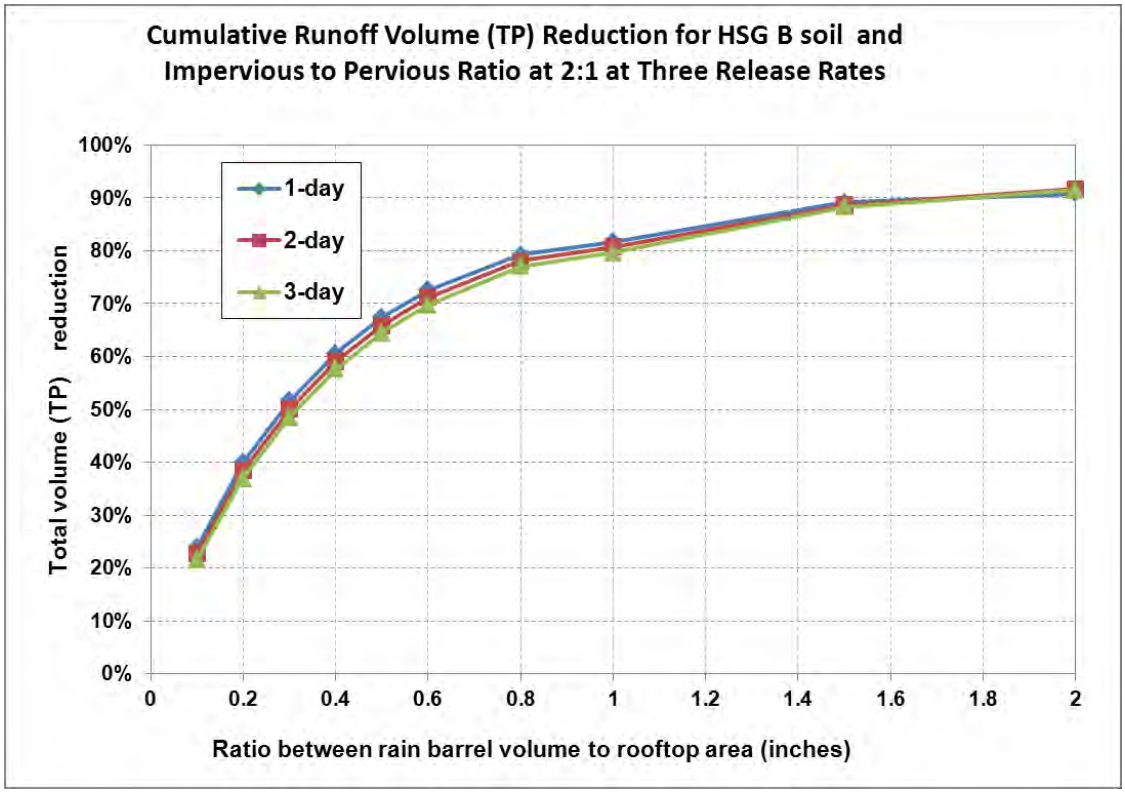


Figure 3- 32: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio= 2:1 for HSG C Soils

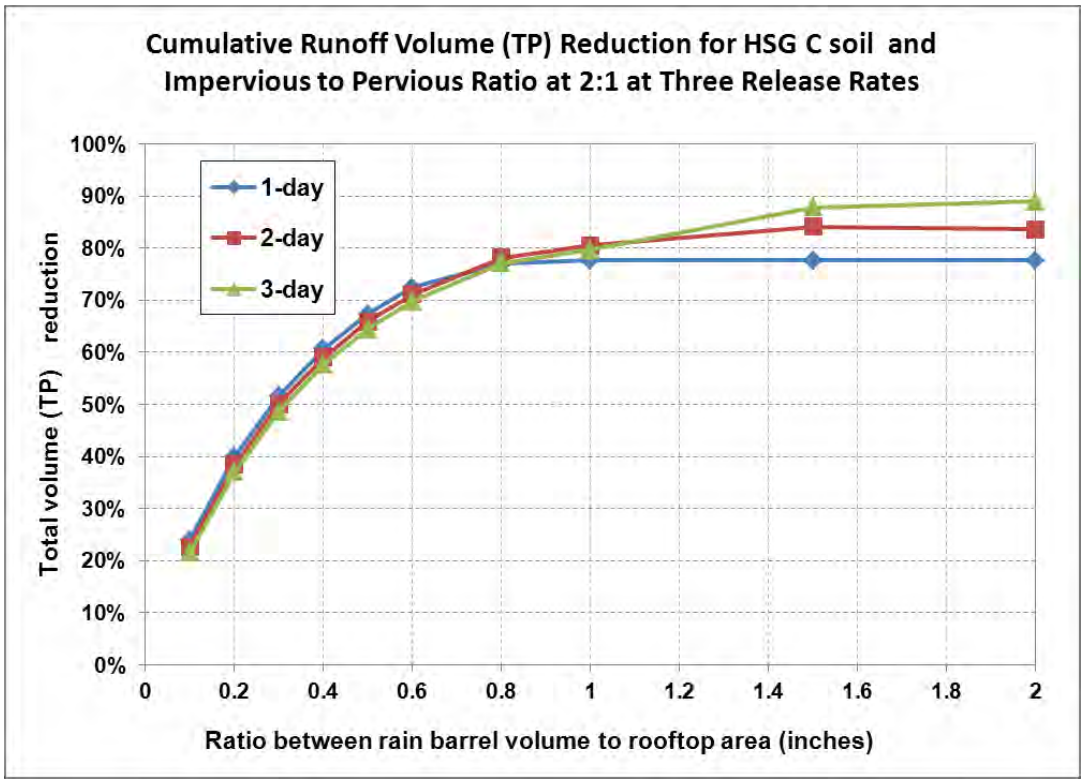


Figure 3- 33: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio= 2:1 for HSG D Soils

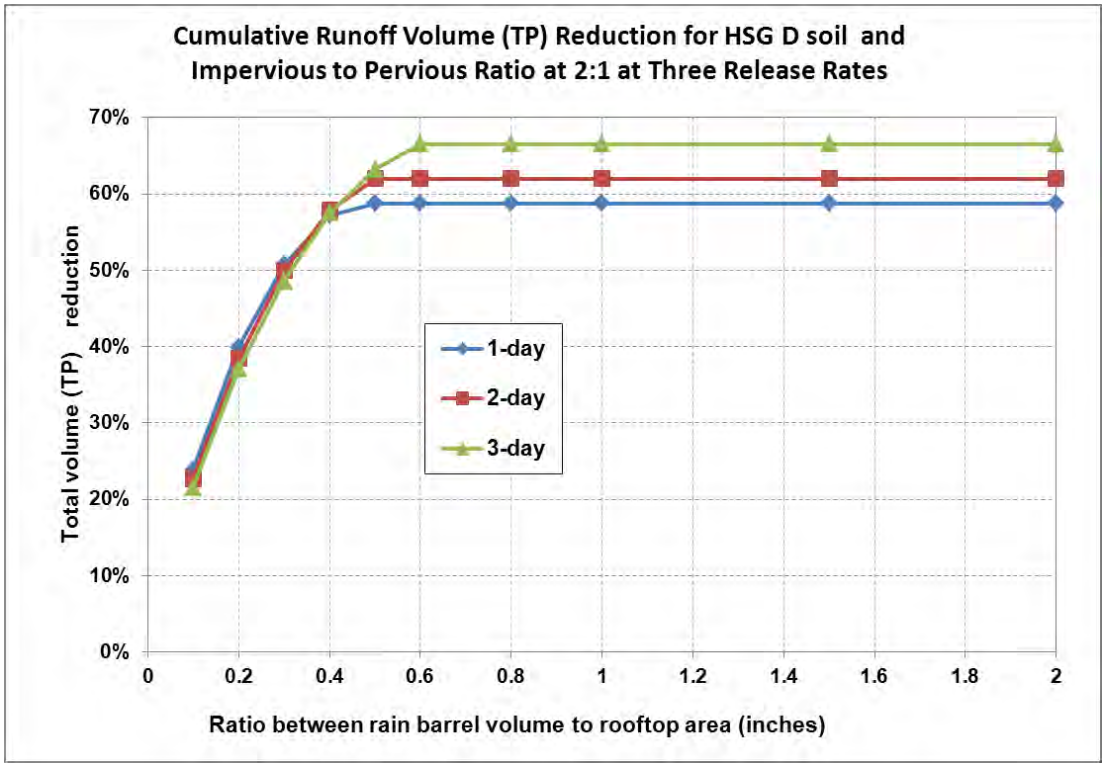


Table 3- 26: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1

Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1												
Storage volume to impervious area ratio	Total Runoff Volume and Phosphorus Load (TP) Reduction Percentages											
	HSG A			HSG B			HSG C			HSG D		
	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day	1-day	2-day	3-day
0.1 in	24%	23%	22%	24%	23%	22%	24%	23%	22%	24%	23%	22%
0.2 in	40%	38%	37%	40%	38%	37%	40%	38%	37%	40%	38%	37%
0.3 in	52%	50%	49%	52%	50%	49%	52%	50%	49%	52%	50%	49%
0.4 in	61%	59%	58%	61%	59%	58%	61%	59%	58%	61%	59%	58%
0.5 in	67%	66%	64%	67%	66%	64%	67%	66%	64%	67%	66%	64%
0.6 in	73%	71%	70%	73%	71%	70%	73%	71%	70%	72%	71%	70%
0.8 in	79%	78%	77%	79%	78%	77%	79%	78%	77%	78%	78%	77%
1.0 in	82%	81%	80%	82%	81%	80%	82%	81%	80%	79%	80%	80%
1.5 in	89%	89%	88%	89%	89%	88%	89%	89%	88%	80%	82%	86%
2.0 in	92%	92%	91%	92%	92%	91%	91%	92%	91%	80%	82%	86%

Figure 3- 34: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1 for HSG A Soils

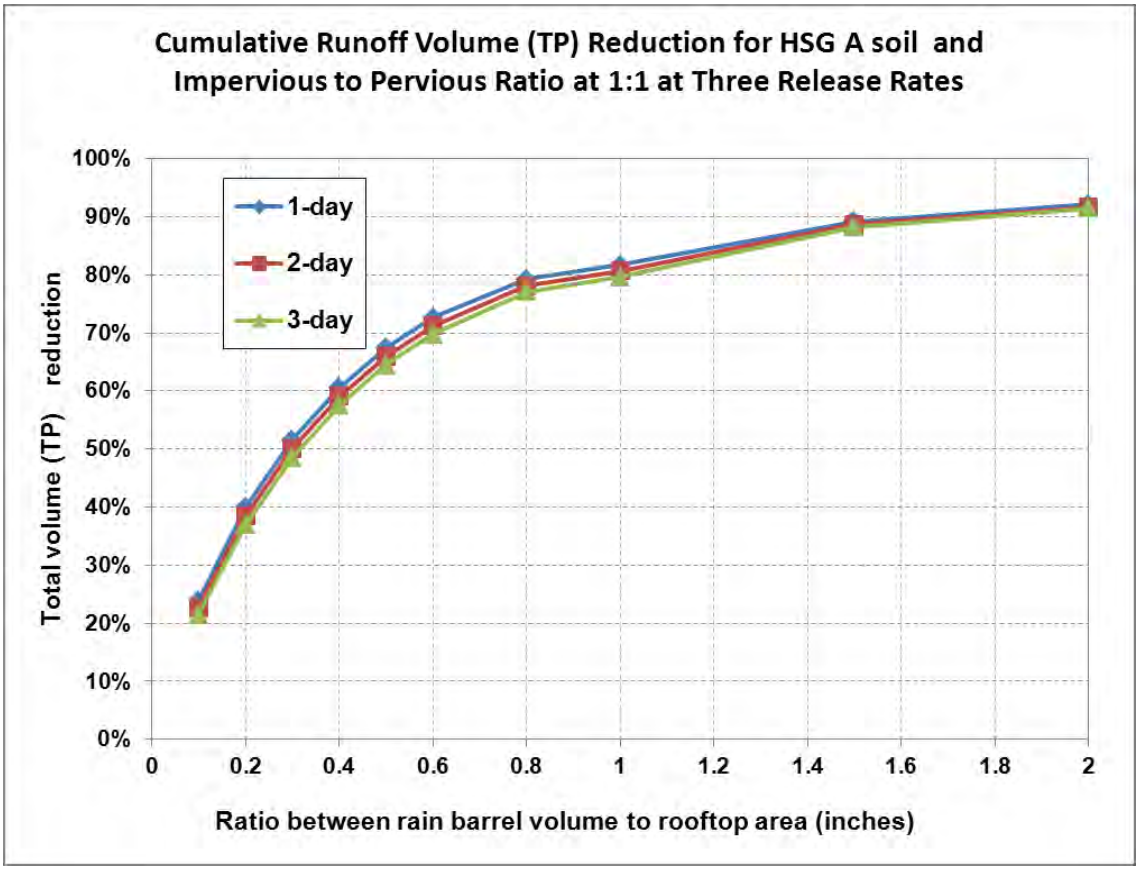


Figure 3- 35: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1 for HSG B Soils

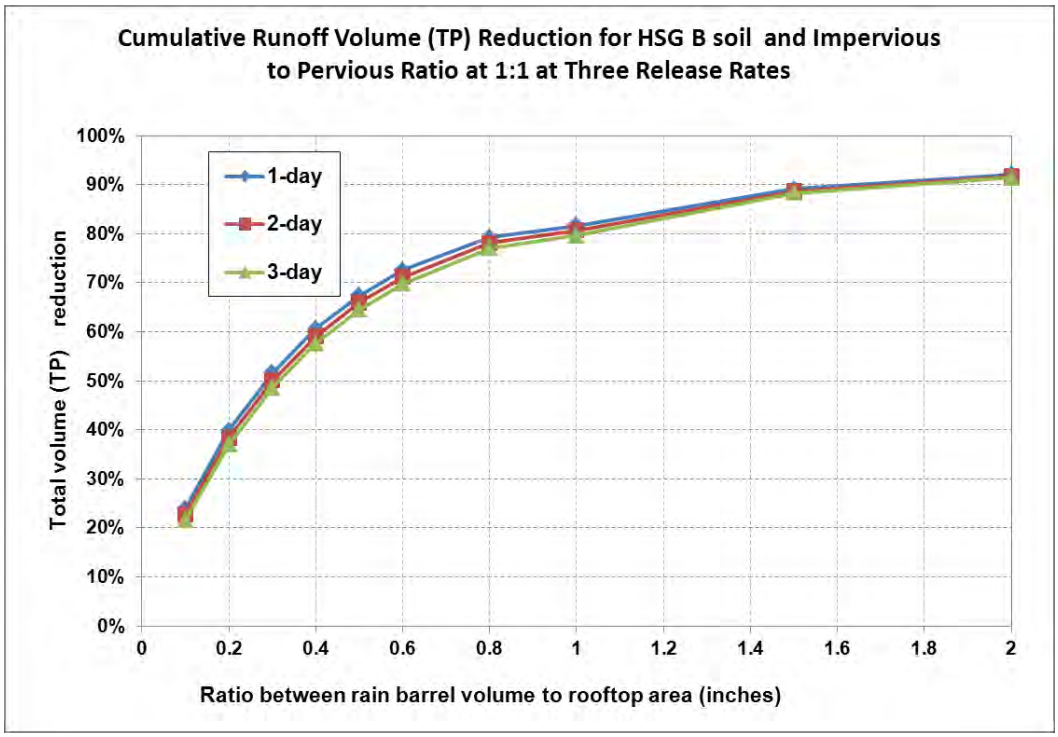


Figure 3- 36: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1 for HSG C Soils

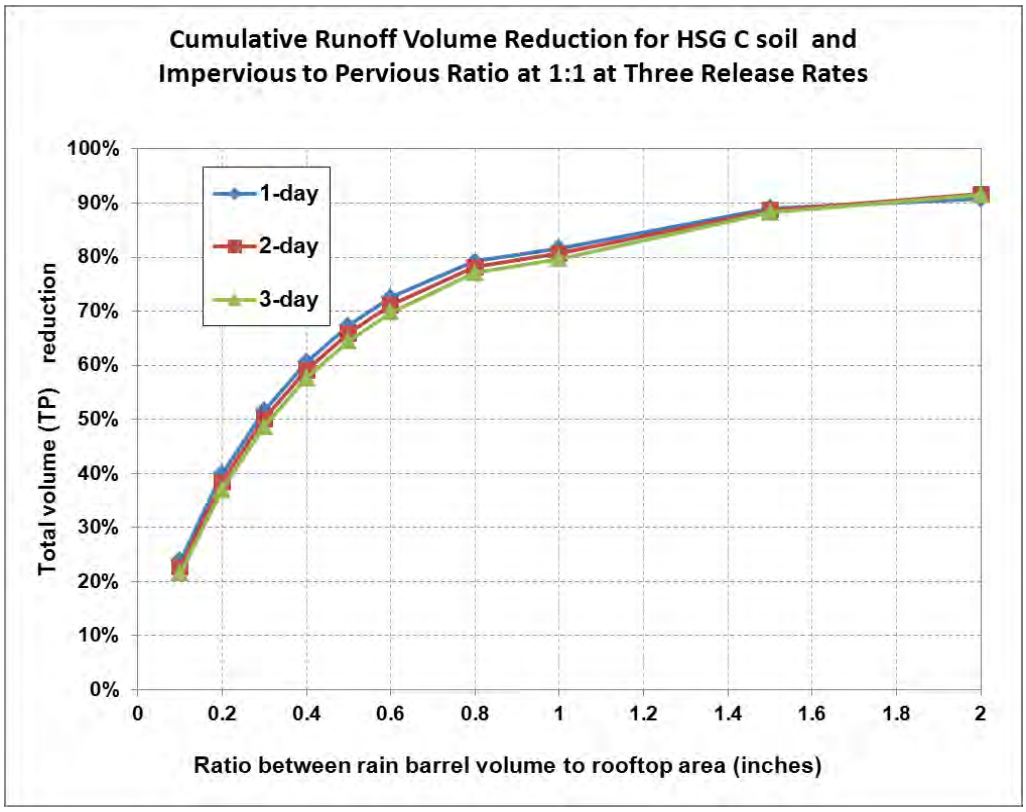


Figure 3- 37: Impervious Area Disconnection through Storage: Impervious Area to Pervious Area Ratio = 1:1 for HSG D Soils

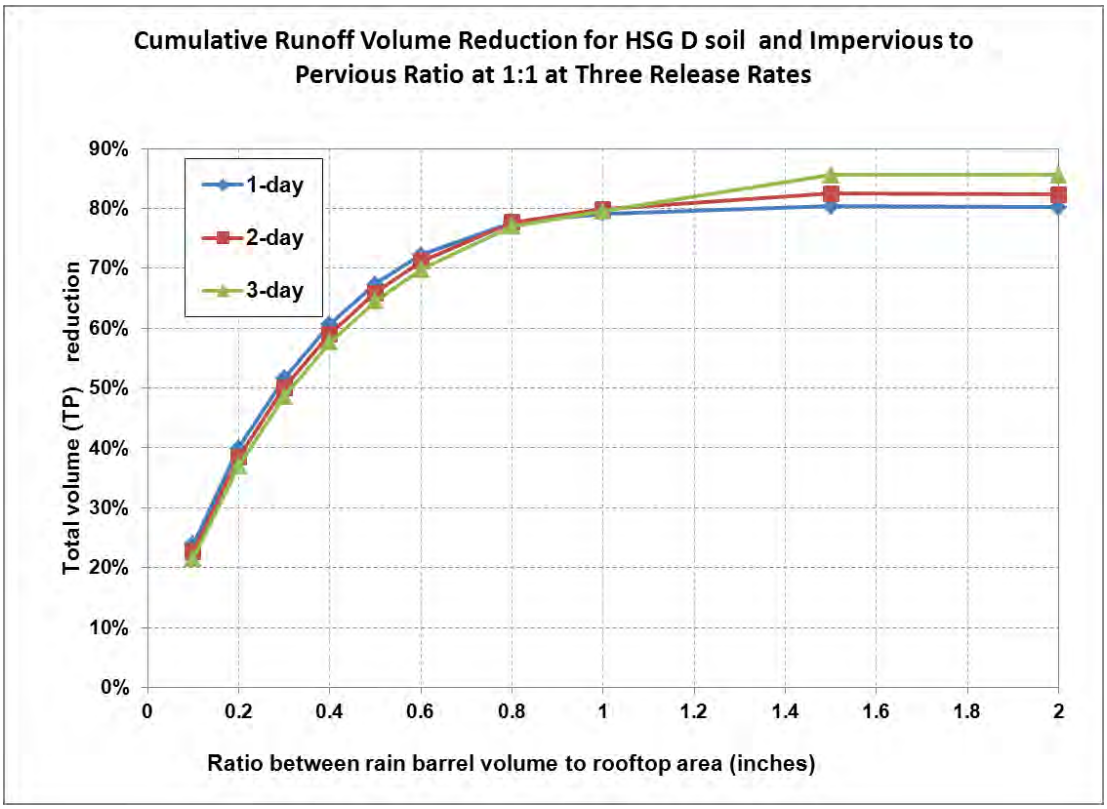


Table 3- 27: Impervious Area Disconnection Performance Table

Impervious area to pervious area ratio	Soil type of Receiving Pervious Area			
	HSG A	HSG B	HSG C	HSG D
8:1	30%	14%	7%	3%
6:1	37%	18%	11%	5%
4:1	48%	27%	17%	9%
2:1	64%	45%	33%	21%
1:1	74%	59%	49%	36%
1:2	82%	67%	60%	49%
1:4	85%	72%	67%	57%

Figure 3- 38: Impervious Area Disconnection Performance Curves

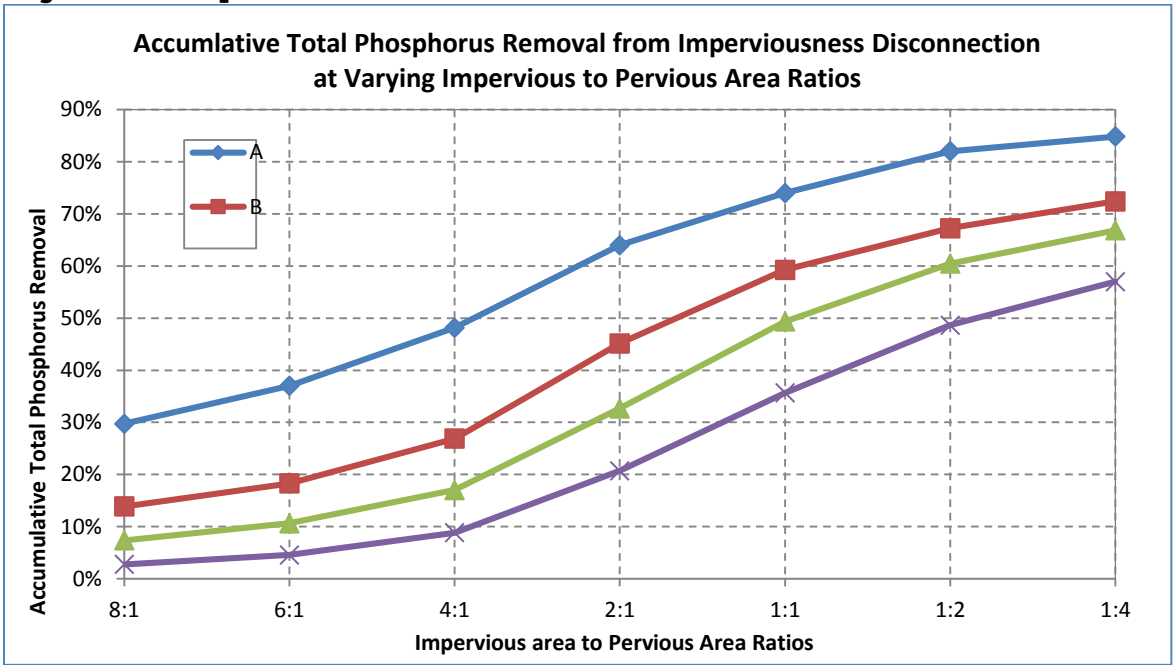


Table 3- 28: Performance Table for Conversion of Impervious Areas to Pervious Area based on Hydrological Soil Groups

Land-Use Group	Cumulative Reduction in Annual Stormwater Phosphorus Load				
	Conversion of impervious area to pervious area-HSG A	Conversion of impervious area to pervious area-HSG B	Conversion of impervious area to pervious area-HSG C	Conversion of impervious area to pervious area-HSG C/D	Conversion of impervious area to pervious area-HSG D
Commercial (Com) and Industrial (Ind)	98.5%	93.5%	88.0%	83.5%	79.5%
Multi-Family (MFR) and High-Density Residential (HDR)	98.8%	95.0%	90.8%	87.3%	84.2%
Medium -Density Residential (MDR)	98.6%	94.1%	89.1%	85.0%	81.4%
Low Density Residential (LDR) - "Rural"	98.2%	92.4%	85.9%	80.6%	75.9%
Highway (HWY)	98.0%	91.3%	84.0%	78.0%	72.7%
Forest (For)	98.2%	92.4%	85.9%	80.6%	75.9%
Open Land (Open)	98.2%	92.4%	85.9%	80.6%	75.9%
Agriculture (Ag)	70.6%	70.6%	70.6%	70.6%	70.6%

Table 3- 29: Performance Table for Conversion of Low Permeable Pervious Area to High Permeable Pervious Area based on Hydrological Soil Group

Land Cover	Cumulative Reduction in Annual SW Phosphorus Load from Pervious Area				
	Conversion of pervious area HSG D to pervious area-HSG A	Conversion of pervious area HSG D to pervious area-HSG B	Conversion of pervious area HSG D to pervious area-HSG C	Conversion of pervious area HSG C to pervious area-HSG A	Conversion of pervious area HSG C to pervious area-HSG B
Developed Pervious Land	92.7%	68.3%	41.5%	83.5%	79.5%

Table 3-30 Method for determining stormwater control design volume (DSV) (i.e., capacity) using Long-term cumulative performance curves

Stormwater Control Type	Description	Applicable Structural Stormwater Control Performance Curve	Equation for calculating Design Storage Capacity for Estimating Cumulative Reductions using Performances Curves
Infiltration Trench	Provides temporary storage of runoff using the void spaces within the soil/sand/gravel mixture that is used to backfill the trench for subsequent infiltration into the surrounding sub-soils.	Infiltration Trench (6 infiltration rates: 0.17, 0.27, 0.52, 1.02, 2.41 and 8.27 inches per hour)	DSV = void space volumes of gravel and sand layers DSV = (L x W x D_{stone} x n_{stone})+ (L x W x D_{sand} x n_{sand})
Subsurface Infiltration	Provides temporary storage of runoff using the combination of storage structures (e.g., galleys, chambers, pipes, etc.) and void spaces within the soil/sand/gravel mixture that is used to backfill the system for subsequent infiltration into the surrounding sub-soils.	Infiltration Trench (6 infiltration rates: 0.17, 0.27, 0.52, 1.02, 2.41 and 8.27 inches per hour)	DSV = Water storage volume of storage units and void space volumes of backfill materials. Example for subsurface galleys backfilled with washed stone: DSV = (L x W x $D)_{galley}$ + (L x W x D_{stone} x n_{stone})
Surface Infiltration	Provides temporary storage of runoff through surface ponding storage structures (e.g., basin or swale) for subsequent infiltration into the underlying soils.	Infiltration Basin (6 infiltration rates: 0.17, 0.27, 0.52, 1.02, 2.41 and 8.27 inches per hour)	DSV = Water volume of storage structure before bypass. Example for linear trapezoidal vegetated swale DSV = (L x ((W_{bottom}+$W_{top@Dmax}$)/2) x D)
Rain Garden/Bio-retention (no underdrains)	Provides temporary storage of runoff through surface ponding and possibly void spaces within the soil/sand/gravel mixture that is used to filter runoff prior to infiltration into underlying soils.	Infiltration Basin (6 infiltration rates: 0.17, 0.27, 0.52, 1.02, 2.41 and 8.27 inches per hour)	DSV = Ponding water storage volume and void space volumes of soil filter media. Example for raingarden : DSV = (A_{pond} x D_{pond}) + (A_{soil} x D_{soil} x $n_{soil\ mix}$)
Tree Filter (no underdrain)	Provides temporary storage of runoff through surface ponding and void spaces within the soil/sand/gravel mixture that is used to filter runoff prior to infiltration into underlying soils.	Infiltration Trench (6 infiltration rates: 0.17, 0.27, 0.52, 1.02, 2.41 and 8.27 inches per hour)	DSV = Ponding water storage volume and void space volumes of soil filter media. DSV = (L x W x $D_{ponding}$) + (L x W x D_{soil} x $n_{soil\ mix}$)
Bio-Filtration (w/underdrain)	Provides temporary storage of runoff for filtering through an engineered soil media. The storage capacity includes void spaces in the filter media and temporary ponding at the surface. After runoff has passed through the filter media it is collected by an under-drain pipe for discharge. Manufactured or packaged bio-filter systems such as tree box filters may be suitable for using the bio-filtration performance results.	Bio-filtration	DSV = Ponding water storage volume and void space volume of soil filter media. Example of a linear biofilter: DSV = (L x W x $D_{ponding}$)+ (L x W x D_{soil} x n_{soil})
Gravel Wetland	Based on design by the UNH Stormwater Center (UNHSC). Provides temporary surface ponding storage of runoff in a vegetated wetland cell that is eventually routed to an underlying saturated gravel internal storage reservoir (ISR) for nitrogen treatment. Outflow is controlled by an elevated orifice that has its invert elevation equal to the top of the ISR layer and provides a retention time of at least 24 hours.	Gravel Wetland	DSV = pretreatment volume + ponding volume + void space volume of gravel ISR. DSV = ($A_{pretreatment}$ x $D_{preTreatment}$)+ ($A_{wetland}$ x $D_{ponding}$)+ (A_{ISR} x D_{gravel} x n_{gravel})
Porous Pavement with subsurface infiltration	Provides filtering of runoff through a filter course and temporary storage of runoff within the void spaces of a subsurface gravel reservoir prior to infiltration into subsoils.	Infiltration Trench (6 infiltration rates: 0.17, 0.27, 0.52, 1.02, 2.41 and 8.27 inches per hour)	DSV = void space volumes of gravel layer DSV = (L x W x D_{stone} x n_{stone})
Porous pavement w/ impermeable underliner w/underdrain	Provides filtering of runoff through a filter course and temporary storage of runoff within the void spaces prior to discharge by way of an underdrain.	Porous Pavement	Depth of Filter Course = D_{FC}
Wet Pond	Provides treatment of runoff through routing through permanent pool.	Wet Pond	DSV= Permanent pool volume prior to high flow bypass DSV=A_{pond} x D_{pond} (does not include pretreatment volume)
Extended Dry Detention Basin	Provides temporary detention storage for the design storage volume to drain in 24 hours through multiple out let controls.	Dry Pond	DSV= Ponding volume prior to high flow bypass DSV=A_{pond} x D_{pond} (does not include pretreatment volume)
Dry Water Quality Swale/Grass Swale	Based on MA design standards. Provides temporary surface ponding storage of runoff in an open vegetated channel through permeable check dams. Treatment is provided by filtering of runoff by vegetation and check dams and infiltration into subsurface soils.	Grass swale	DSV = Volume of swale at full design depth DSV=Lswale x Aswale
Definitions: DSV= Design Storage Volume = physical storage capacity to hold water; **VSV** = Void Space Volume; **L** = length, **W** = width, **D** = depth at design capacity before bypass, **n** = porosity fill material, **A**= average surface area for calculating volume; **Infiltration rate** = saturated soil hydraulic conductivity			

Appendix G
Massachusetts Small MS4 Permit Monitoring Requirements
For Discharges into Impaired Waters – Parameters and Methods

Pollutant Causing Impairment	Monitoring Parameter	EPA or Approved Method No.
Aluminum	Aluminum, Total	200.7; 200.8; 200.9
Ammonia (Un-ionized)	Ammonia – Nitrogen	350.1
Arsenic	Arsenic, Total	200.7; 200.8; 200.9
Cadmium	Cadmium, Total	200.7; 200.8; 200.9
Chlordane	NMR	608; 625
Chloride	Chloride	300
Chromium (total)	Chromium, Total	200.7; 200.8; 200.9
Copper	Copper, Total	200.7; 200.8; 200.9
DDT	NMR	608; 625
DEHP (Di-sec-octyl phthalate)	NMR	---
Dioxin (including 2,3,7,8-TCDD)	NMR	613; 1613
Dioxin (2,3,7,8-Tetrachlorodibenzo-p-dioxin only)	NMR	613
Lead	Lead, Total	200.7; 200.8; 200.9
Mercury in Water Column	NMR unless potentially present such (e.g., salvage yards crushing vehicles with Hg switches)	200.7; 200.8; 200.9
Nitrogen (Total)	Nitrogen, Total	351.1/351.2 + 353.2
Pentachlorophenol (PCP)	NMR	---
Petroleum Hydrocarbons	Oil and Grease	1664
Phosphorus (Total)	Phosphorus, Total	365.1; 365.2; 365.3; SM 4500-P-E
Polychlorinated biphenyls	NMR	---
Polycyclic Aromatic Hydrocarbons (PAHs) (Aquatic Ecosystems)	PAHs	610; 1625
Sulfide-Hydrogen Sulfide	NMR	---
Mercury in Fish Tissue	NMR	---
PCB in Fish Tissue	NMR	---
Total Dissolved Solids	Total Dissolved Solids	160.1
Total Suspended Solids (TSS)	Total Suspended Solids	160.2, 180.1
Turbidity	Total Suspended Solids and Turbidity	160.2, 180.1
Secchi disk transparency	Total Suspended Solids	160.2
Sediment Screening Value (Exceedence)	Total Suspended Solids	160.2

Sedimentation/Siltation	Total Suspended Solids	160.2
Bottom Deposits	Total Suspended Solids	160.2
Color	NMR	---
pH, High	pH	150.2
pH, Low	pH	150.2
Taste and Odor	NMR	---
Temperature, water	NMR	---
Salinity	Specific Conductance	120.1
Enterococcus	Enterococcus	1106.1; 1600; Enterolert® 12 22.
Escherichia coli	E. coli	1103.1; 1603; Colilert® 12 16, Colilert-18® 12 15 16.; mColiBlue-24®17.
Fecal Coliform	Fecal Coliform	1680; 1681
Organic Enrichment (Sewage) Biological Indicators	Enterococcus (marine waters) or E. coli (freshwater)	1106.1; 1600
Debris/Floatables/Trash	NMR	or
Foam/Flocs/Scum/Oil Slicks	Contact MassDEP	1103.1; 1603
Oil and Grease	Oil and Grease	---
Chlorophyll-a	Total Phosphorus (freshwater)	---
	Total Nitrogen (marine waters)	1664
Nutrient/Eutrophication Biological Indicators	Total Phosphorus (freshwater)	365.1; 365.2; 365.3
	Total Nitrogen (marine waters)	351.1/351.2 + 353.2
Dissolved oxygen saturation / Oxygen, Dissolved	Dissolved Oxygen	365.1; 365.2; 365.3
	Temperature	351.1/351.2 + 353.2
	BOD_5	360.1; 360.2
	Total Phosphorus (freshwater)	SM-2550
	Total Nitrogen (marine waters)	SM-5210
Excess Algal Growth	Total Phosphorus (freshwater)	365.1; 365.2; 365.3
	Total Nitrogen (marine waters)	351.1/351.2 + 353.2
Aquatic Plants (Macrophytes)	NMR	---

Abnormal Fish deformities, erosions, lesions, tumors (DELTS)	NMR	---
Abnormal Fish Histology (Lesions)	NMR	---
Estuarine Bioassessments	Contact MassDEP	---
Fishes Bioassessments	Contact MassDEP	---
Aquatic Macroinvertebrate Bioassessments	Contact MassDEP	---
Combined Biota/Habitat Bioassessments	Contact MassDEP	---
Habitat Assessment (Streams)	Contact MassDEP	---
Lack of a coldwater assemblage	Contact MassDEP	---
Fish Kills	Contact MassDEP	---
Whole Effluent Toxicity (WET)	Contact MassDEP	---
Ambient Bioassays -- Chronic Aquatic Toxicity	Contact MassDEP	---
Sediment Bioassays -- Acute Toxicity Freshwater	Contact MassDEP	---
Sediment Bioassays -- Chronic Toxicity Freshwater	Contact MassDEP	---
Fish-Passage Barrier	NMR	---
Alteration in stream-side or littoral vegetative covers	NMR	---
Low flow alterations	NMR	---
Other flow regime alterations	NMR	---
Physical substrate habitat alterations	NMR	---
Other anthropogenic substrate alterations	NMR	---
Non-Native Aquatic Plants	NMR	---
Eurasian Water Milfoil, Myriophyllum spicatum	NMR	---
Zebra mussel, Dreissena polymorph	NMR	---
Other	Contact MassDEP	---

Notes:

NMR" indicates no monitoring required

"Total Phosphorus (freshwater)" indicates monitoring required for total phosphorus where stormwater discharges to a water body that is freshwater

"Total Nitrogen (marine water)" indicates monitoring required for total nitrogen where stormwater discharges to a water body that is a marine or estuarine water

APPENDIX H

Requirements Related to Discharges to Certain Water Quality Limited Waterbodies

Table of Contents

I. Discharges to water quality limited waterbodies and their tributaries where nitrogen is the cause of the impairment

1. Part 2.2.2.a.i. of the permit identifies the permittees subject to additional requirements to address nitrogen in their stormwater discharges because they discharge to waterbodies that are water quality limited due to nitrogen, or their tributaries, without an EPA approved TMDL. Permittees identified in part 2.2.2.a.i of the permit must identify and implement BMPs designed to reduce nitrogen discharges in the impaired catchment(s). To address nitrogen discharges each permittee shall comply with the following requirements:

    a. Additional or Enhanced BMPs

        i. The permittee remains subject to all 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:

            1. Part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute an annual message in the spring (April/May) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute an annual message in the Fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The permittee shall deliver an annual

message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of nitrogen to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP. All public education messages can be combined with requirements of Appendix H part II and III as well as Appendix F part A.III, A.IV, A.V, B.I, B.II and B.III where appropriate.

2. Part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for nitrogen removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs to reduce nitrogen discharges.

3. Part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: establish requirements for use of slow release fertilizers on permittee owned property currently using fertilizer, in addition to reducing and managing fertilizer use as provided in 2.3.7.1; establish procedures to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; increase street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

b. Nitrogen Source Identification Report

i. Within four years of the permit effective date the permittee shall complete a Nitrogen Source Identification Report. The report shall include the following elements:

1. Calculation of total MS4 area draining to the water quality limited water segments or their tributaries, incorporating updated mapping of the MS4 and catchment delineations produced pursuant to part 2.3.4.6,
2. All screening and monitoring results pursuant to part 2.3.4.7.d., targeting the receiving water segment(s)
3. Impervious area and DCIA for the target catchment
4. Identification, delineation and prioritization of potential catchments with high nitrogen loading
5. Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during redevelopment

ii. The final Nitrogen Source Identification Report shall be submitted to EPA as part of the year 4 annual report.

c. Potential Structural BMPs

i. Within five years of the permit effective date, the permittee shall evaluate all permittee-owned properties identified as presenting retrofit opportunities or areas for structural BMP installation under permit part 2.3.6.d.ii. or identified in the Nitrogen Source Identification Report that are within the drainage area of the impaired water or its tributaries. The evaluation shall include:

1. The next planned infrastructure, resurfacing or redevelopment activity planned for the property (if applicable) OR planned retrofit date;
2. The estimated cost of redevelopment or retrofit BMPs; and
3. The engineering and regulatory feasibility of redevelopment or retrofit BMPs.

ii. The permittee shall provide a listing of planned structural BMPs and a plan and schedule for implementation in the year 5 annual report. The permittee shall plan and install a minimum of one structural BMP as a demonstration project within the drainage area of the water quality limited water or its tributaries within six years of the permit effective date. The demonstration project shall be installed targeting a catchment with high nitrogen load potential. The permittee shall install the remainder of the structural BMPs in accordance with the plan and schedule provided in the year 5 annual report.

iii. Any structural BMPs listed in Table 3 of Attachment 1 to Appendix H already existing or installed in the regulated area by the permittee or its agents shall be tracked and the permittee shall estimate the nitrogen removal by the BMP consistent with Attachment 1 to Appendix H. The permittee shall document the BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated nitrogen removed in mass per year by the BMP in each annual report.

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix H part I.1. 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 and all downstream segments are determined to no longer be impaired due to nitrogen by MassDEP and EPA concurs with such determination.
   ii. An EPA approved TMDL for the receiving water or downstream receiving water indicates that no additional stormwater controls for the control of nitrogen are necessary for the permittee's discharge based on wasteload allocations as part of the approved TMDL.

b. In such a case, the permittee shall document the date of the determination provided for in paragraph a. above or the approved TMDL date in its SWMP and is relieved of any additional requirements of Appendix H part I.1. as of the applicable date and the permittee shall comply with the following:

i. The permittee shall identify in its SWMP all activities that have been implemented in accordance with the requirements of Appendix H part I.1. as of the applicable date to reduce nitrogen 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 I.1. required to be done prior to the date of determination or the date of the approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

II. Discharges to water quality limited waterbodies and their tributaries where phosphorus is the cause of the impairment

1. Part 2.2.2.b.i. of the permit identifies the permittees subject to additional requirements to address phosphorus in their stormwater discharges because they discharge to waterbodies that are water quality limited due to phosphorus, or their tributaries, without an EPA approved TMDL. Permittees identified in part 2.2.2.b.i. of the permit must identify and implement BMPs designed to reduce phosphorus discharges in the impaired catchment(s). To address phosphorus discharges each permittee shall comply with the following requirements:

    a. Additional or Enhanced BMPs

        i. 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:

            1. Part 2.3.2, Public education and outreach: The permittee shall supplement its Residential and Business/Commercial/Institution program with annual timed messages on specific topics. The permittee shall distribute an annual message in the spring (March/April) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release and phosphorous-free fertilizers. The permittee shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The permittee shall distribute an annual message in the fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The permittee shall deliver an annual message on each of these topics, unless the permittee determines that one or more of these issues is not a significant contributor of phosphorous to discharges from the MS4 and the permittee retains documentation of this finding in the SWMP. All public education messages can be combined with requirements of Appendix H part I and III as well as Appendix F part A.III, A.IV, A.V, B.I, B.II and B.III where appropriate.

            2. Part 2.3.6, Stormwater Management in New Development and Redevelopment: the requirement for adoption/amendment of the permittee's ordinance or other regulatory mechanism shall include a requirement that new development and redevelopment stormwater management BMPs be optimized for phosphorus removal; retrofit inventory and priority ranking under 2.3.6.1.b shall include consideration of BMPs that infiltrate stormwater where feasible.

            3. Part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: Establish procedures to properly manage grass cuttings and leaf litter on permittee property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; increased street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a

minimum of two times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

b. Phosphorus Source Identification Report

i. Within four years of the permit effective date the permittee shall complete a Phosphorus Source Identification Report. The report shall include the following elements:

1. Calculation of total MS4 area draining to the water quality limited receiving water segments or their tributaries, incorporating updated mapping of the MS4 and catchment delineations produced pursuant to part 2.3.4.6,
2. All screening and monitoring results pursuant to part 2.3.4.7.d., targeting the receiving water segment(s)
3. Impervious area and DCIA for the target catchment
4. Identification, delineation and prioritization of potential catchments with high phosphorus loading
5. Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during redevelopment, including the removal of impervious area

ii. The phosphorus source identification report shall be submitted to EPA as part of the year 4 annual report.

c. Potential Structural BMPs

i. Within five years of the permit effective date, the permittee shall evaluate all permittee-owned properties identified as presenting retrofit opportunities or areas for structural BMP installation under permit part 2.3.6.d.ii or identified in the Phosphorus Source Identification Report that are within the drainage area of the water quality limited water or its tributaries. The evaluation shall include:

1. The next planned infrastructure, resurfacing or redevelopment activity planned for the property (if applicable) OR planned retrofit date;
2. The estimated cost of redevelopment or retrofit BMPs; and
3. The engineering and regulatory feasibility of redevelopment or retrofit BMPs.

ii. The permittee shall provide a listing of planned structural BMPs and a plan and schedule for implementation in the year 5 annual report. The permittee shall plan and install a minimum of one structural BMP as a demonstration project within the drainage area of the water quality limited water or its tributaries within six years of the permit effective date. The demonstration project shall be installed targeting a catchment with high phosphorus load potential. The permittee shall install the

remainder of the structural BMPs in accordance with the plan and schedule provided in the year 5 annual report.

iii. Any structural BMPs installed in the regulated area by the permittee or its agents shall be tracked and the permittee shall estimate the phosphorus removal by the BMP consistent with Attachment 3 to Appendix F. The permittee shall document the BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated phosphorus removed in mass per year by the BMP in each annual report.

2. At any time during the permit term the permittee may be relieved of additional requirements in Appendix H part II.1. 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 and all downstream segments are determined to no longer be impaired due to phosphorus by MassDEP and EPA concurs with such determination.
   ii. An EPA approved TMDL for the receiving water or downstream receiving water indicates that no additional stormwater controls for the control of phosphorus are necessary for the permittee's discharge based on wasteload allocations as part of the approved TMDL.

b. In such a case, the permittee shall document the date of the determination provided for in paragraph a. above or the approved TMDL date in its SWMP and is relieved of any additional requirements of Appendix H part II.1. as of the applicable date and the permittee shall comply with the following:
   i. The permittee shall identify in its SWMP all activities that have been implemented in accordance with the requirements of Appendix H part II.1. as of the applicable date to reduce phosphorus 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 II.1. required to be done prior to the date of determination or the date of the approved TMDL, including ongoing implementation of identified non-structural BMPs and routine maintenance and replacement of all structural BMPs in accordance with manufacturer or design specifications.

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

IV. Discharges to water quality limited waterbodies where chloride 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 chloride, without an EPA approved TMDL, are subject to the following additional requirements to address chloride in their stormwater discharges.

2. Permittees discharging to a waterbody listed as impaired due to chloride in categories 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act sections 303(d) and 305(b) shall develop a Salt Reduction Plan that includes specific actions designed to achieve salt reduction on municipal roads and facilities, and on private facilities that discharge to its MS4 in the impaired catchment(s). The Salt Reduction Plan shall be completed within three years of the effective date of the permit and include the BMPs in part IV.4. below. The Salt Reduction Plan shall be fully implemented five years after the effective date of the permit.

3. Permittees that, during the permit term, become aware that their discharge is to a waterbody that is impaired due to chloride must update their Salt Reduction Plan within 60 days of becoming aware of the situation to include salt reduction practices targeted at lowering chloride in discharges to the impaired waterbody. If the permittee does not have a Salt Reduction Plan already in place, then the permittee shall complete a Salt Reduction Plan that includes the BMPs in part IV 4) below within 3 years of becoming aware of the situation and fully implement the Salt Reduction Plan within 5 years of becoming aware of the situation.

4. Additional or Enhanced BMPs

   a. For municipally maintained surfaces:

      i. Tracking of the types and amount of salt applied to all permittee owned and maintained surfaces and reporting of salt use beginning in the year of the completion of the Salt Reduction Plan in the permittee's annual reports;

      ii. Planned activities for salt reduction on municipally owned and maintained surfaces, which shall include but are not limited to the following unless the permittee determines one or more of the following is not applicable to its system and documents that determination as part of the Salt Reduction Plan:
         - Operational changes such as pre-wetting, pre-treating the salt stockpile, increasing plowing prior to de-icing, monitoring of road surface temperature, etc.;
         - Implementation of new or modified equipment providing pre-wetting capability, better calibration rates, or other capability for minimizing salt use;
         - Training for municipal staff and/or contractors engaged in winter maintenance activities;
         - Adoption of guidelines for application rates for roads and parking lots (see *Winter Parking Lot and Sidewalk Maintenance*

Manual (Revised edition June 2008) http://www.pca.state.mn.us/publications/parkinglotmanual.pdf; and the application guidelines on page 17 of *Minnesota Snow and Ice Control: Field Handbook for Snow Operators (September 2012)* http://www.mnltap.umn.edu/publications/handbooks/documents/snowice.pdf for examples);

- Regular calibration of spreading equipment;
- Designation of no-salt and/or low salt zones;
- Measures to prevent exposure of salt stockpiles (if any) to precipitation and runoff; and
- An estimate of the total tonnage of salt reduction expected by each activity.

b. For privately maintained facilities that discharge to the MS4:

i. Establish an ordinance, bylaw, or other regulatory mechanism requiring measures to prevent exposure of any salt stockpiles to precipitation and runoff at all commercial and industrial properties within the regulated area.

ii. Part 2.3.2. Public Education and Outreach: The permittee shall supplement its Commercial/Industrial education program with an annual message to private road salt applicators and commercial and industrial site owners on the proper storage and application rates of winter deicing material. The educational materials shall be disseminated in the November/December timeframe and shall describe steps that can be taken to minimize salt use and protect local waterbodies.

iii. Part 2.3.6, Stormwater Management in New Development and Redevelopment – establish procedures and requirements to minimize salt usage and require the use of salt alternatives where the permittee deems necessary.

c. The completed Salt Reduction Plan shall be submitted to EPA along with the annual report following the Salt Reduction Plan's completion. Each subsequent annual report shall include an update on Plan implementation progress, any updates to the Salt Reduction Plan deemed necessary by the permittee, as well as the types and amount of salt applied to all permittee owned and maintained surfaces.

5. At any time during the permit term the permittee may be relieved of additional requirements in Appendix H part IV as follows:

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 chloride 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 chloride 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[2] and EPA agrees with such a determination. The permittee shall submit data to EPA that accurately characterizes the concentration of chloride in their discharge during the deicing season (November – March). The characterization shall include water quality and flow data sufficient to accurately assess the concentration of chloride in the deicing season 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 and include samples collected during deicing activities.

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 IV 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 IV to date to reduce chloride in its discharges, including implementation schedules for non-structural BMPs

ii. The permittee shall continue to implement all requirements of Appendix H part IV required to be done by 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

[2] 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/

V. Discharges to water quality limited waterbodies and their tributaries where solids, oil and grease (hydrocarbons), or metals 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 solids, metals, or oil and grease (hydrocarbons), without an EPA approved TMDL, are subject to the following additional requirements to address solids, metals, or oil and grease (hydrocarbons) 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 2.3.6, Stormwater Management in New Development and Redevelopment: stormwater management systems designed on commercial and industrial land use area draining to the water quality limited waterbody 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. EPA also encourages the permittee to require any stormwater management system designed to infiltrate stormwater on commercial or industrial sites to provide the level of pollutant removal equal to or greater than the level of pollutant removal provided through the use of biofiltration of the same volume of runoff to be infiltrated, prior to infiltration.

        ii. Part 2.3.7, Good House Keeping and Pollution Prevention for Permittee Owned Operations: increased street sweeping frequency of all municipal owned streets and parking lots to a schedule determined by the permittee to target areas with potential for high pollutant loads. This may include, but is not limited to, increased street sweeping frequency in commercial areas and high density residential areas, or drainage areas with a large amount of impervious area. Prioritize inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full. Clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings. Each annual report shall include the street sweeping schedule determined by the permittee to target high pollutant loads.

3. At any time during the permit term the permittee may be relieved of additional requirements in Appendix H part V.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 solids, metals, or oil and grease (hydrocarbons) 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 solids, metals, or oil and grease (hydrocarbons) 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 and EPA agrees with such a determination[3]. 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 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 V.2. as of that date and the permittee shall comply with the following:

iv. The permittee shall identify in its SWMP all activities implemented in accordance with the requirements of Appendix H part V.2. to date to reduce solids, metals, or oil and grease (hydrocarbons) in its discharges, including implementation schedules for non-structural BMPs and any maintenance requirements for structural BMPs

v. The permittee shall continue to implement all requirements of Appendix H part V.3. required to be done by 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

[3] 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/

ATTACHMENT 1 TO APPENDIX H

The estimates of nitrogen load reductions resulting from BMP installation are intended for informational purposes only and there is no associated permittee-specific required nitrogen load reduction in the Draft Permit. Nitrogen load reduction estimates calculated consistent with the methodologies below may be used by the permittee to comply with future permit requirements providing the EPA determines the calculated reductions are appropriate for demonstrating compliance with future permit requirements. This attachment provides the method and an example to calculate the BMP nitrogen load as well as methods to calculate nitrogen load reductions for structural BMPs in an impaired watershed.

BMP N Load:

The **BMP N Load** is the annual nitrogen load from the drainage area to each proposed or existing BMP used by permittee. This measure is used to estimate the amount of annual nitrogen load that the BMP will receive or treat (BMP N Load).

To calculate the BMP N Load for a given BMP:

1) Determine the total drainage area to the BMP and sort the total drainage area into two categories: total impervious area (IA) and total pervious area (PA);

2) Calculate the nitrogen load associated with impervious area (N Load $_{IA}$) and the pervious area (N Load $_{PA}$) by multiplying the IA and PA by the appropriate land use-based nitrogen load export rate provided in Table 1; and

3) Determine the total nitrogen load to the BMP by summing the calculated impervious and pervious subarea nitrogen loads.

Table 1: Annual nitrogen load export rates

Nitrogen Source Category by Land Use	Land Surface Cover	Nitrogen Load Export Rate, lbs/ac/yr	Nitrogen Load Export Rate, kg/ha/yr
All Impervious Cover	Impervious	14.1	15.8
*Developed Land Pervious (DevPERV)- HSG A	Pervious	0.3	0.3
*Developed Land Pervious (DevPERV)- HSG B	Pervious	1.2	1.3
*Developed Land Pervious (DevPERV) – HSG C	Pervious	2.4	2.7
*Developed Land Pervious (DevPERV) - HSG C/D	Pervious	3.0	3.4
*Developed Land Pervious (DevPERV) - HSG D	Pervious	3.7	4.1
Notes: For pervious areas, if the hydrologic soil group (HSG) is known, use the appropriate value from this table. If the HSG is not known, assume HSG C/D conditions for the nitrogen load export rate.			

Example 1 to determine nitrogen load to a proposed BMP when the contributing drainage area is 100% impervious: A permittee is proposing a storm water infiltration system that will treat runoff from 1.49 acres of impervious area.

Table 1-1: Design parameters for Bio-filtration w/ ISR systems for Example 1

Components of representation	Parameters	Value
Ponding	Maximum depth	0.33 ft
	Surface area	645 ft^2
Soil mix	Depth	2.0 ft
	Porosity	0.24
	Hydraulic conductivity	2.5 inches/hour
Stone Reservoir (ISR)	Depth	2.50 ft
	Porosity	0.42
	Hydraulic conductivity	500 inches/hour
ISR Volume: System Storage Volume	Ratio	0.56
Orifices	Diameter	12 in
		Installed 2.5 above impermeable soil layer

Determine:

A) Percent nitrogen load reduction (BMP Reduction $_{\%\text{-}N}$) for the specified bio-filtration w/ISR system and contributing impervious drainage area; and

B) Nitrogen reduction in pounds that would be accomplished by the bio-filtration w/ISR system (BMP-Reduction $_{lbs\text{-}N}$)

Solution:

1) The BMP is a bio-filtration w/ISR system that will treat runoff from 1.49 acres of impervious area (IA = 1.49 acre);

2) The available storage volume capacity (ft^3) of the bio-filtration w/ISR system (BMP-Volume $_{BMP\text{-}ft^3}$) is determined using the surface area of the system, depth of ponding, the porosity of the filter media and the porosity of the stone reservoir:

BMP-Volume $_{BMP\text{-}ft^3}$ =Surface area x (pond maximum depth + (soil mix depth x soil mix porosity) + stone reservoir depth x gravel layer porosity))
= 520 ft^2 x (0.33 ft + (2.0ft x 0.24) + (2.5 ft x 0.42))
= 1,200 ft^3

3) The available storage volume capacity of the bio-filtration w/ISR system in inches of runoff from the contributing impervious area (BMP-Volume $_{IA\text{-}in}$) is calculated using equation 1:

BMP-Volume $_{IA\text{-}in}$ = (BMP-Volume $_{ft^3}$/ IA (acre) x 12 in/ft x 1 acre/43560 ft^2 **(Equation 1)**

Example 1 Continued:

BMP-Volume $_{IA\text{-}in}$ = (1,200 ft^3/1.49 acre) x 12 in/ft x 1 acre/43560 ft^2
= 0.22 in

4) Using the Regional Performance Curve shown in Figure 1 for a bio-filtration w/ ISR system, a **61%** nitrogen load reduction (BMP Reduction %-N) is determined for a bio-filtration w/ ISR systems sized for 0.22 in of runoff from 1.49 acres of impervious area; and

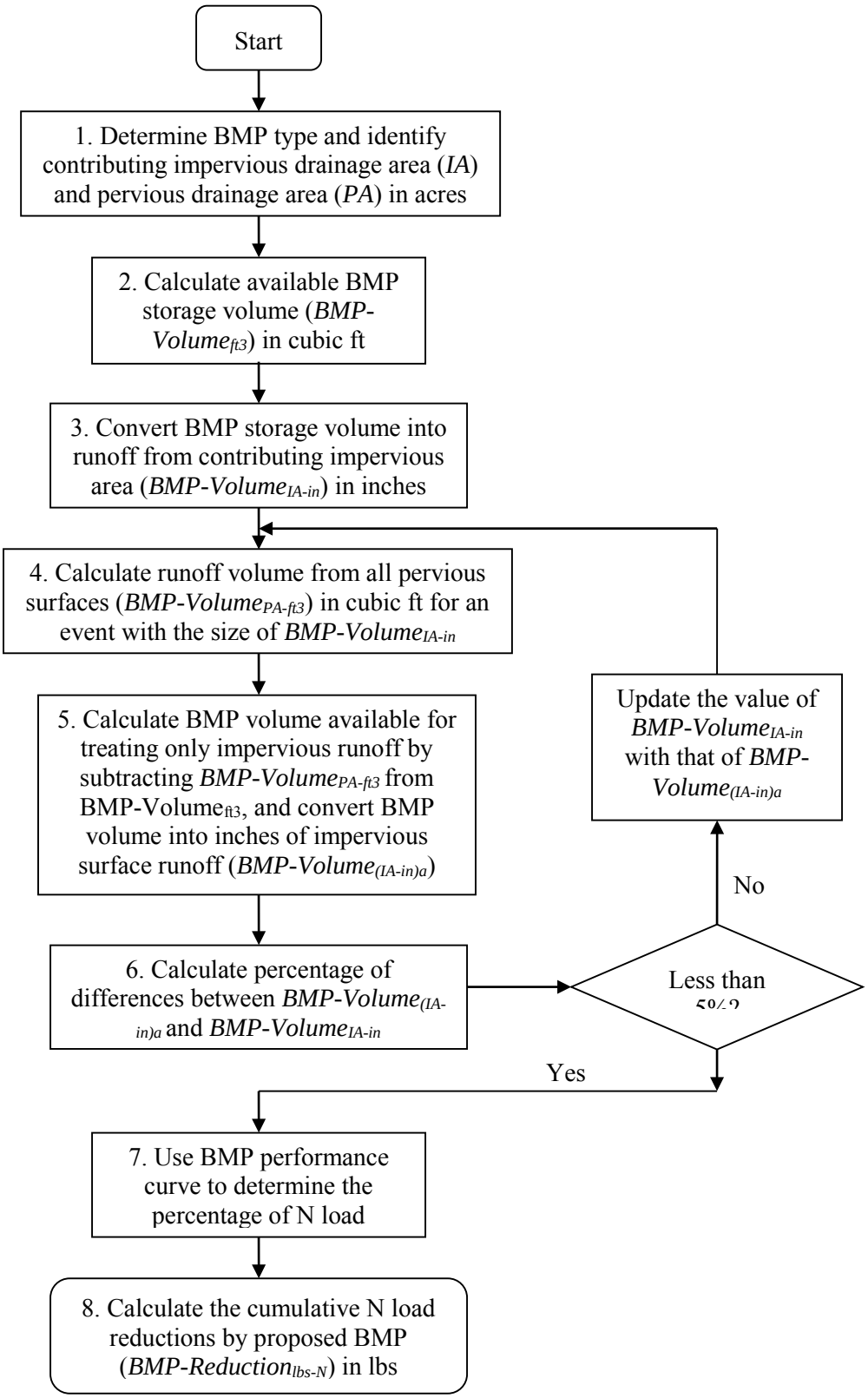
5) Calculate the nitrogen load reduction in pounds of nitrogen for the bio-filtration w/ISR system (BMP Reduction $_{lbs\text{-}N}$) using the BMP Load calculation method shown above in Example 1 and the BMP Reduction $_{\%\text{-}N}$ determined in step 4 by using equation 2.

First, the BMP Load is determined as specified in Example 1:

BMP Load = IA (acre) x 14.1 lb/ac/yr
= 1.49 acres x 14.1 lbs/acre/yr
= 21.0 lbs/yr

BMP Reduction $_{lbs\text{-}N}$ = BMP Load x (BMP Reduction $_{\%\text{-}N}$/100) **(Equation 2)**
BMP Reduction $_{lbs\text{-}N}$ = 21 lbs/yr x (61/100)
= **12.8 lbs/yr**

Method to determine the nitrogen load reduction for a structural BMP with a known storage volume when the contributing drainage area has impervious and pervious surfaces



Flow Chart 2 (previous page). Method to determine the nitrogen load reduction for a BMP with known storage volume when both pervious and impervious drainage areas are present.

1) Identify the type of structural BMP and characterize the contributing drainage area to the structural BMP by identifying the following information for the impervious and pervious surfaces:

Impervious area (IA) – Area (acre) and export rate (Table 1)

Pervious area (PA) – Area (acre) and runoff depth based on hydrologic soil group (HSG) and size of rainfall event. Table 2 provides values of runoff depth for various rainfall depths and HSGs. Soils are assigned to an HSG based on their permeability. HSG categories for pervious areas in the Watershed shall be estimated by consulting local soil surveys prepared by the National Resource Conservation Service (NRCS) or by a storm water professional evaluating soil testing results from the Watershed. If the HSG condition is not known, a HSG D soil condition should be assumed.

Table 2: Developed Land Pervious Area Runoff Depths based on Precipitation depth and Hydrological Soil Groups (HSGs)

Rainfall Depth, Inches	Runoff Depth, inches		
	Pervious HSG A/B	Pervious HSG C	Pervious HSG D
0.10	0.00	0.00	0.00
0.20	0.00	0.01	0.02
0.40	0.00	0.03	0.06
0.50	0.00	0.05	0.09
0.60	0.01	0.06	0.11
0.80	0.02	0.09	0.16
1.00	0.03	0.12	0.21
1.20	0.04	0.14	0.39
1.50	0.11	0.39	0.72
2.00	0.24	0.69	1.08

Notes: Runoff depths derived from combination of volumetric runoff coefficients from Table 5 of *Small Storm Hydrology and Why it is Important for the Design of Stormwater Control Practices*, Pitt, 1999 and using the Stormwater Management Model (SWMM) in continuous model mode for hourly precipitation data for Boston, MA, 1998-2002.

2) Determine the available storage volume (ft^3) of the structural BMP (BMP-Volume $_{ft^3}$) using the BMP dimensions and design specifications (e.g., maximum storage depth, filter media porosity);

3) To estimate the nitrogen load reduction of a BMP with a known storage volume capacity, it is first necessary to determine the portion of available BMP storage capacity (BMP-Volume $_{ft^3}$) that would treat the runoff volume generated from the contributing impervious area (IA) for a rainfall event with a depth of *i* inches (in). This will require knowing the corresponding amount of runoff volume that would be generated from the contributing pervious area (PA) for the same rainfall event (depth of *i* inches). Using equation 3 below, solve for the BMP capacity that would be available to treat runoff from the contributing imperious area for the unknown rainfall depth of *i* inches (see equation 4):

$$\text{BMP-Volume}_{ft^3} = \text{BMP-Volume}_{(IA\text{-}ft^3)i} + \text{BMP-Volume}_{(PA\text{-}ft^3)i} \quad \textbf{(Equation 3)}$$

Where:

BMP-Volume $_{ft^3}$	= the available storage volume of the BMP
BMP-Volume $_{(IA\text{-}ft^3)i}$	= the available storage volume of the BMP that would fully treat runoff generated from the contributing impervious area for a rainfall event of size *i* inches
BMP-Volume $_{(PA\text{-}ft^3)i}$	= the available storage volume of the BMP that would fully treat runoff generated from the contributing pervious area for a rainfall event of size *i* inches

Solving for BMP-Volume $_{(IA\text{-}ft^3)i}$:

$$\text{BMP-Volume}_{(IA\text{-}ft^3)i} = \text{BMP-Volume}_{ft^3} - \text{BMP-Volume}_{(PA\text{-}ft^3)i} \quad \textbf{(Equation 4)}$$

To determine BMP-Volume $_{(IA\text{-}ft^3)i}$, requires performing an iterative process of refining estimates of the rainfall depth used to calculate runoff volumes until the rainfall depth used results in the sum of runoff volumes from the contributing IA and PA equaling the available BMP storage capacity (BMP-Volume $_{ft^3}$). For the purpose of estimating BMP performance, it will be considered adequate when the IA runoff depth (in) is within 5% IA runoff depth used in the previous iteration.

For the first iteration (1), convert the BMP-Volume $_{ft^3}$ determined in step 2 into inches of runoff from the contributing impervious area (BMP Volume $_{(IA\text{-}in)1}$) using equation 5.

$$\text{BMP-Volume}_{(IA\text{-}in)1} = (\text{BMP-Volume}_{ft^3} / \text{IA (acre)}) \times (12 \text{ in/ft} / 43{,}560 \text{ ft}^2/\text{acre}) \quad \textbf{(Equation 5)};$$

For iterations 2 through n (2…n), convert the BMP Volume $_{(IA\text{-}ft^3)2\ldots n}$, determined in step 5a below, into inches of runoff from the contributing impervious area (BMP Volume $_{(IA\text{-}in)2\ldots n}$) using equation 6.

$$\text{BMP-Volume}_{(IA\text{-}in)2\ldots n} = (\text{BMP-Volume}_{(IA\text{-}ft^3)2\ldots n} / \text{IA (acre)}) \times (12 \text{ in/ft} / 43{,}560 \text{ ft}^2/\text{acre}) \quad \textbf{(Equation 6)};$$

4) For 1 to n iterations, use the pervious runoff depth information from Table 2 and equation 7 to determine the total volume of runoff (ft^3) from the contributing PA (BMP Volume

$_{PA\text{-}ft^3}$) for a rainfall size equal to the sum of BMP-Volume $_{(IA\text{-}in)1}$, determined in step 3. The runoff volume for each distinct pervious area must be determined.

BMP Volume $_{(PA\text{-}ft^3)1...n} = \sum$ ((PA x (runoff depth)$_{(PA1, PA2..PAn)}$ x (3,630 ft^3/acre-in) **(Equation 7)**

5) For iteration 1, estimate the portion of BMP Volume that is available to treat runoff from only the IA by subtracting BMP-Volume $_{PA\text{-}ft^3}$, determined in step 4, from BMP-Volume $_{ft^3}$, determined in step 2, and convert to inches of runoff from IA (see equations 8 and 9):

BMP-Volume $_{(IA\text{-}ft^3)2}$ = ((BMP-Volume$_{ft^3}$- BMP Volume $_{(PA\text{-}ft^3)1}$) **(Equation 8)**

BMP-Volume $_{(IA\text{-}in)2}$ = (BMP-Volume $_{(IA\text{-}ft^3)2}$/IA (acre)) x (12 in/ft x 1 acre/43,560 ft^2) **(Equation 9)**

If additional iterations (i.e., 2 through n) are needed, estimate the portion of BMP volume that is available to treat runoff from only the IA (BMP-Volume $_{(IA\text{-}in)3..n+1}$) by subtracting BMP Volume $_{(PA\text{-}ft^3)2..n}$, determined in step 4, from BMP Volume $_{(IA\text{-}ft^3)3..n+1}$, determined in step 5, and by converting to inches of runoff from IA using equation 9):

6) For iteration A (an iteration between 1 and n+1), compare BMP Volume $_{(IA\text{-}in)a}$ to BMP Volume $_{(IA\text{-}in)a\text{-}1}$ determined from the previous iteration (a-1). If the difference in these values is greater than 5% of BMP Volume $_{(IA\text{-}in)a}$ then repeat steps 4 and 5, using BMP Volume $_{(IA\text{-}in)a}$ as the new starting value for the next iteration (a+1). If the difference is less than or equal to 5 % of BMP Volume $_{(IA\text{-}in)a}$ then the permittee may proceed to step 7.

7) Determine the % nitrogen load reduction for the structural BMP (BMP Reduction $_{\%\text{-}N}$) using the appropriate BMP curve on Figure 1 or 2 and the BMP-Volume $_{(IA\text{-}in)n}$ calculated in the final iteration of step 5; and

8) Calculate the nitrogen load reduction in pounds of nitrogen for the structural BMP (BMP Reduction $_{lbs\text{-}N}$) using the BMP Load as calculated above in Example 1 and the percent nitrogen load reduction (BMP Reduction $_{\%\text{-}N}$) determined in step 7 by using equation 10:

BMP Reduction $_{lbs\text{-}N}$ = BMP Load x (BMP Reduction $_{\%\text{-}N}$/100) **(Equation 10)**

Example 2: Determine the nitrogen load reduction for a structural BMP with a known design volume when the contributing drainage area has impervious and pervious surfaces

A permittee is considering an infiltration basin to capture and treat runoff from a portion of the Watershed draining to the impaired waterbody. The contributing drainage area is 16.55 acres and is 71% impervious. The pervious drainage area (PA) is 80% HSG D and 20% HSG C. An infiltration basin with the following specifications can be placed at the down-gradient end of the contributing drainage area where soil testing results indicates an infiltration rate (IR) of 0.28 in/hr:

Example continued:

Structure	Bottom area (acre)	Top surface area (acre)	Maximum pond depth (ft)	Design storage volume (ft^3)	Infiltration Rate (in/hr)
Infiltration basin	0.65	0.69	1.65	48,155	0.28

Determine the:

A) Percent nitrogen load reduction (BMP Reduction $_{\%\text{-}N}$) for the specified infiltration basin and the contributing impervious and pervious drainage area; and

B) Nitrogen reduction in pounds that would be accomplished by the BMP (BMP-Reduction $_{lbs\text{-}N}$)

Solution:

1) A surface infiltration basin is being considered. Information for the contributing impervious (IA) and pervious (PA) areas are summarized in below.

Impervious area characteristics

ID	% Impervious	Area (acre)
IA1	100	11.75

Pervious area characteristics

ID	Area (acre)	Hydrologic Soil Group (HSG)
PA1	3.84	D
PA2	0.96	C

2) The available storage volume (ft^3) of the infiltration basin (BMP-Volume $_{ft^3}$) is determined from the design details and basin dimensions; BMP-Volume $_{ft^3} = 48{,}155\ ft^3$.

3) To determine what the BMP design storage volume is in terms of runoff depth (in) from IA, an iterative process is undertaken:

Solution Iteration 1

For the first iteration (1), the BMP-Volume$_{ft^3}$ is converted into inches of runoff from the contributing impervious area (BMP Volume $_{(IA\text{-}in)1}$) using equation 5.

$$\text{BMP Volume}_{(IA\text{-}in)1} = (48{,}155\ ft^2 / 11.75\ \text{acre}) \times (12\ \text{in/ft} / 43{,}560\ ft^2/\text{acre})$$
$$= 1.13\ \text{in}$$

Solution Continued:

4-1) The total volume of runoff (ft^3) from the contributing PA (BMP Volume $_{PA\text{-}ft^3}$) for a rainfall size equal to the sum of BMP Volume $_{(IA\text{-}in)1}$ determined in step 3 is determined

for each distinct pervious area using the information from Table 2 and equation 7. Interpolation was used to determine runoff depths.

BMP Volume $_{(PA\text{-}ft^3)1}$ = ((3.84 acre x (0.33 in) + (0.96 acre x (0.13 in)) x 3,630 ft^3/acre-in
= 5052 ft^3

5-1) For iteration 1, the portion of BMP Volume that is available to treat runoff from only the IA is estimated by subtracting the BMP Volume $_{(PA\text{-}ft^3)1}$, determined in step 4-1, from BMP Volume$_{ft^3}$, determined in step 2, and converted to inches of runoff from IA:

BMP Volume $_{(IA\text{-}ft^3)\,2}$ = 48,155 ft^3 – 5052 ft^3
= 43,103 ft^3
BMP Volume $_{(IA\text{-}in)\,2}$ = (43,103 ft^3/11.75 acre) x (12 in/ft x 1 acre/43,560 ft^2)
= 1.01 in

6-1) The % difference between BMP Volume $_{(IA\text{-}in)\,2}$, 1.01 in, and BMP Volume $_{(IA\text{-}in)1}$, 1.13 in is determined and found to be significantly greater than 5%:

% Difference = ((1.13 in – 1.01 in)/1.01 in) x 100
= 12%

Therefore, steps 4 through 6 are repeated starting with BMP Volume $_{(IA\text{-}in)\,2}$ = 1.01 in.

Solution Iteration 2

4-2) BMP-Volume $_{(PA\text{-}ft^3)2}$ = ((3.84 acre x 0.21 in) + (0.96 acre x 0.12 in)) x 3,630 ft^3/acre-in
= 3,358 ft^3

5-2) BMP-Volume $_{(IA\text{-}ft^3)\,3}$ = 48,155 ft^3 – 3,358 ft^3
= 44,797 ft^3

BMP-Volume $_{(IA\text{-}in)\,3}$ = (44,797 ft^3/11.75 acre) x (12 in/ft x 1 acre/43,560 ft^2)
= 1.05 in

6-2) % Difference = ((1.05 in – 1.01 in)/1.05 in) x 100
= 4%

The difference of 4% is acceptable.

Solution Continued:

7) The % nitrogen load reduction for the infiltration basin (BMP Reduction $_{\%\text{-}N}$) is determined by using the RR treatment curve in Figure 2 and the treatment volume (BMP-Volume $_{\text{Net IA-in}}$ = 1.05 in) calculated in step 5-2 and is **BMP Reduction $_{\%\text{-}N}$ = 56%**.

9) The nitrogen load reduction in pounds of nitrogen (BMP-Reduction $_{\text{lbs-N}}$) for the proposed infiltration basin is calculated by using equation 11 with the BMP Load (as determined by the procedure in Example 4-1) and the N $_{\text{target}}$ of 56%.

$$\text{BMP-Reduction}_{\text{lbs-N}} = \text{BMP N Load} \times (N_{\text{target}}/100) \qquad \textbf{(Equation 11)}$$

Following example 1, the BMP load is calculated:

BMP N Load = (IA x impervious cover nitrogen export loading rate)
+ ($PA_{HSG\ D}$ x pervious cover nitrogen export loading rate, HSG D
+ ($PA_{HSG\ C}$ x pervious cover nitrogen export loading rate, HSG C)
= (16.55 acre x 15.4 lbs/acre/yr) + (3.84 acre x 3.7 lbs/acre/yr) + (0.96 acre x 2.4 lbs/acre/yr)
= 271.4 lbs/yr

BMP-Reduction $_{\text{lbs-N}}$ = 275.13 lbs/yr x 56/100 = **152.0 lbs/yr**

Figure 1: Regional BMP Performance Curve for Annual Nitrogen Load Removal: System Design by the University of New Hampshire Stormwater Center (UNHSWC)

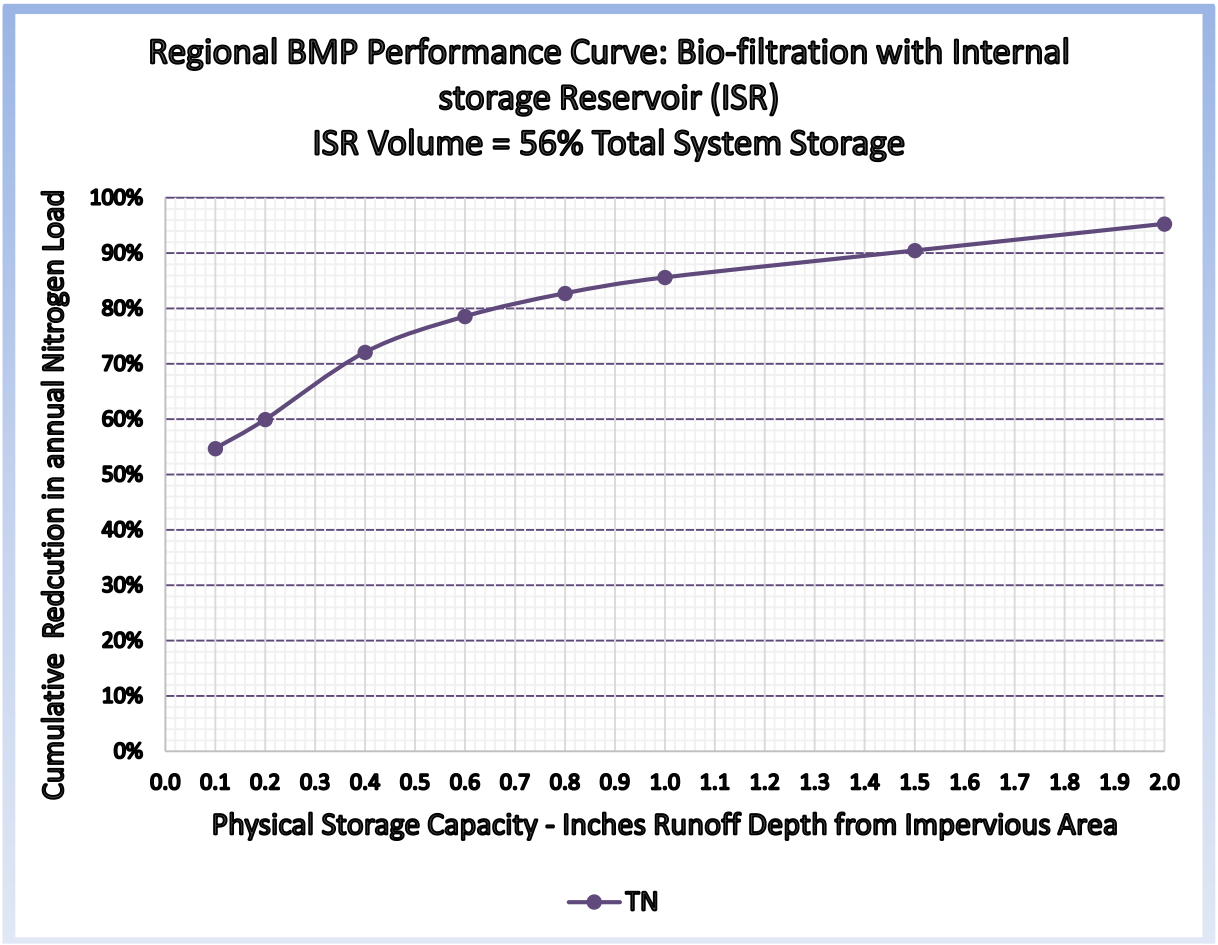
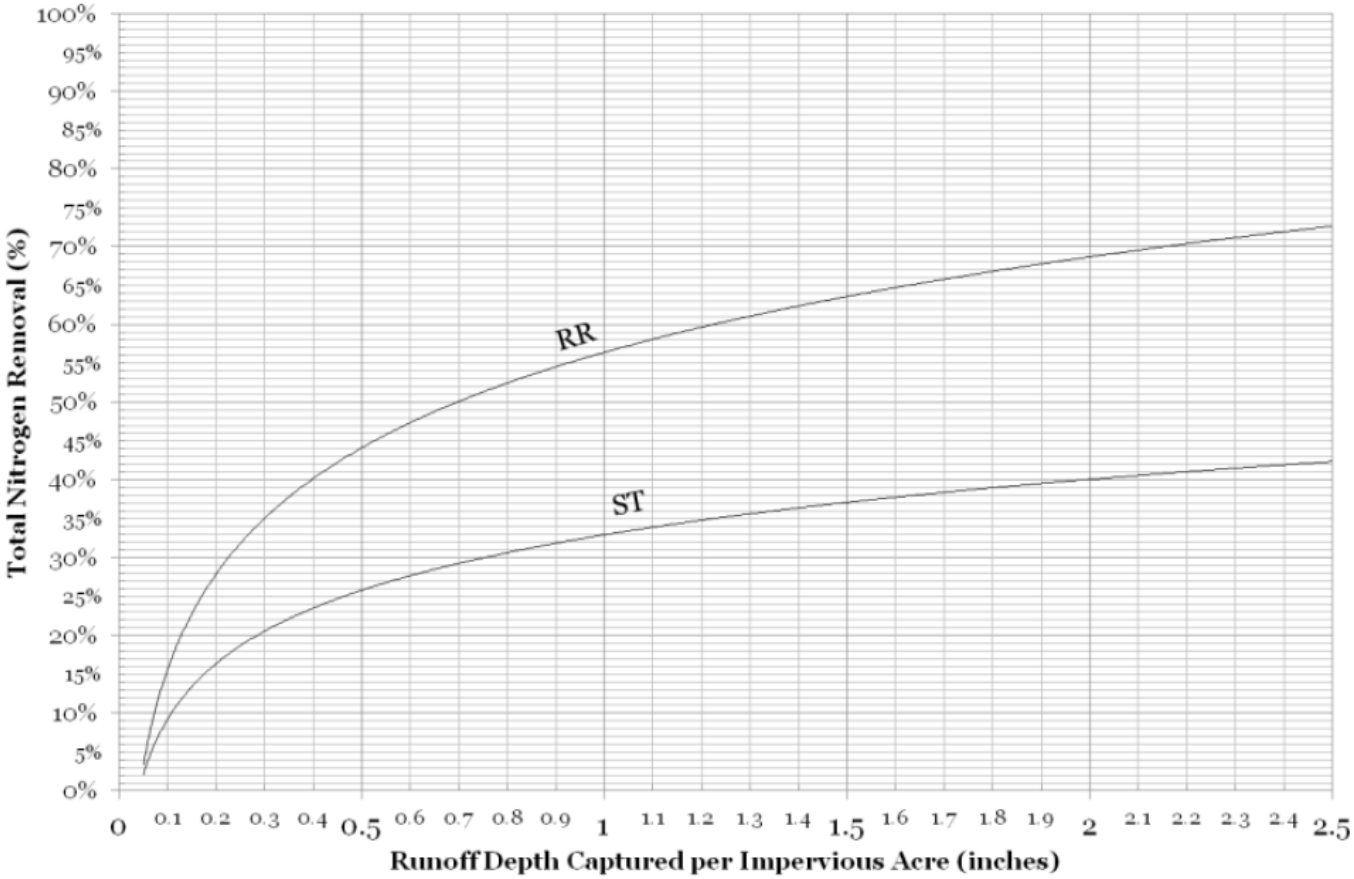


Table 3. Classification of BMP to Determine Nitrogen Reduction[1]

Structural BMP	Classification
Infiltration Trench	Runoff Reduction (RR)
Infiltration Basin or other surface infiltration practice	Runoff Reduction (RR)
Bioretention Practice	Runoff Reduction (RR)
Gravel Wetland System	Stormwater Treatment (ST)
Porous Pavement	Runoff Reduction (RR)
Wet Pond or wet detention basin	Stormwater Treatment (ST)
Dry Pond or detention basin	Runoff Reduction (RR)
Water Quality Swale	Runoff Reduction (RR)

[1]**Recommendations of the Expert Panel to Define Removal Rates for New State Stormwater Performance Standards** http://chesapeakestormwater.net/wp-content/plugins/download-monitor/download.php?id=25, Retrieved 12/14/2012

Figure 2: Total Nitrogen Removal for RR and ST Practices



Adopted from: Final CBP Approved Expert Panel Report on Stormwater Retrofits http://chesapeakestormwater.net/wp-content/plugins/download-monitor/download.php?id=25, Retrieved 12/14/2012

APPENDIX D

2016 MS4 Notice of Intent

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part I: General Conditions

General Information

Name of Municipality or Organization: City of Revere State: MA

EPA NPDES Permit Number (if applicable): MA041057

Primary MS4 Program Manager Contact Information

Name: Nicholas J. Rystrom, PE Title: City Engineer

Street Address Line 1: Revere City Hall, Engineering Department,

Street Address Line 2: 281 Broadway

City: Revere State: MA Zip Code: 02151

Email: nrystrom@revere.org Phone Number: (781) 286-8153

Fax Number:

Other Information

Stormwater Management Program (SWMP) Location (web address or physical location, if already completed): City Hall

Eligibility Determination

Endangered Species Act (ESA) Determination Complete? Yes

Eligibility Criteria (check all that apply): ☐ A ☒ B ☐ C

National Historic Preservation Act (NHPA) Determination Complete? Yes

Eligibility Criteria (check all that apply): ☒ A ☐ B ☐ C

☑ Check the box if your municipality or organization was covered under the 2003 MS4 General Permit

MS4 Infrastructure (if covered under the 2003 permit)

Estimated Percent of Outfall Map Complete? *(Part II, III, IV or V, Subpart B.3.(a.) of 2003 permit)* 100%

If 100% of 2003 requirements not met, enter an estimated date of completion (MM/DD/YY):

Web address where MS4 map is published:

If outfall map is unavailable on the internet an electronic or paper copy of the outfall map must be included with NOI submission (see section V for submission options)

See Attached

Regulatory Authorities (if covered under the 2003 permit)

Illicit Discharge Detection and Elimination (IDDE) Authority Adopted? *(Part II, III, IV or V, Subpart B.3.(b.) of 2003 permit)* Yes

Effective Date or Estimated Date of Adoption (MM/DD/YY): 09/15/05

Construction/Erosion and Sediment Control (ESC) Authority Adopted? *(Part II,III,IV or V, Subpart B.4.(a.) of 2003 permit)* Yes

Effective Date or Estimated Date of Adoption (MM/DD/YY): 09/15/05

Post- Construction Stormwater Management Adopted? *(Part II, III, IV or V, Subpart B.5.(a.) of 2003 permit)* Yes

Effective Date or Estimated Date of Adoption (MM/DD/YY): 09/15/05

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part II: Summary of Receiving Waters

Please list the waterbodies to which your MS4 discharges. For each waterbody, please report the number of outfalls discharging into it and, if applicable, the segment ID and any impairments.

Massachusetts list of impaired waters: *Massachusetts 2014 List of Impaired Waters-* http://www.mass.gov/eea/docs/dep/water/resources/07v5/14list2.pdf

Waterbody that receives flow from the MS4 and segment ID if applicable	Number of outfalls into receiving water segment	Chloride	Chlorophyll-a	Dissolved Oxygen/ DO Saturation	Nitrogen	Oil & Grease/ PAH	Phosphorus	Solids/ TSS/ Turbidity	E. coli	Enterococcus	Other pollutant(s) causing impairments
Atlantic Ocean	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Belle Isle Inlet (MA71-14)	5	☐	☐	☐	☐	☐	☐	☐	☐	☐	Fecal Coliform, Other, PCB in Fish Tissue
Central County Ditch	6	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Diamond Creek	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Eastern County Ditch	8	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Green Creek (MA71-12)	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Mill Creek (MA71-08)	12	☐	☐	☐	☐	☐	☐	☐	☐	☐	Fecal Coliform, Other, PCB in Fish Tissue
Pines River (MA93-15)	16	☐	☐	☐	☐	☐	☐	☐	☐	☐	Fecal Coliform
Sales Creek (MA71-12)	6	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Saugus River (MA93-44)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	Fecal Coliform, Oil and Grease, Temperature, water
Town Line Brook (MA93-51)	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	(Alteration in stream-side or littoral vegetative covers*), (Debris/Floatables/Trash*), (Other flow regime alterations*), (Physical substrate habitat alterations*), Fecal Coliform, Taste and Odor, Taste and Odor
Trifone Brook	10	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Unnammed	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
Total MS4 Regulated Outfalls	89	☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary

Identify the Best Management Practices (BMPs) that will be employed to address each of the six Minimum Control Measures (MCMs). For municipalities/organizations whose MS4 discharges into a receiving water with an approved Total Maximum Daily Load (TMDL) and an applicable waste load allocation (WLA), identify any additional BMPs employed to specifically support the achievement of the WLA in the TMDL section at the end of part III.

For each MCM, list each existing or proposed BMP by category and provide a brief description, responsible parties/departments, measurable goals, and the year the BMP will be employed (public education and outreach BMPs also requires a target audience). **Use the drop-down menus in each table or enter your own text to override the drop down menu.**

MCM 1: Public Education and Outreach

BMP Media/Category (enter your own text to override the drop down menu)	**BMP Description**	**Targeted Audience**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal**	**Beginning Year of BMP Imple-mentation**
Videos	Stormwater Education Video posted to website/ social media/etc. and broadcast on local community TV	Residents	Engineering/External contractor	Track views and viewership	2019
Press release/Social media post	Proper management of private parking lots	Businesses	Engineering/External contractor	Track views and readership	2019
Social media post	Proper use of fertilizer	Residents	Engineering/External contractor	Track views	2019
Brochures/Pamphlets	"Scoop the poop" pledge" included with dog licenses	Residents	Engineering/External contractor	Track brochures distributed and pledges taken	2020
Social media post	Share ThinkBlue Massachusetts' FaceBook post	Developers (construction)	Engineering/External contractor	Track views	2020
Brochures/Pamphlets	Erosion Control prevention flyer posted at City Hall and other municipal buildings	Developers (construction)	Engineering/External contractor	Track number of visits to posted locations	2019
Press Release	Erosion Control prevention notice	Developers (construction)	Engineering/External contractor	Track readership	2019
Social media post/Website Banner & Text	Clean Water Tip: Bag, Compost & Mulch Leaves	Residents	Engineering/External contractor	Track views/visits to page	2020

Brochures/Pamphlets/Webpage	Pollution Prevention	Businesses	Engineering/External contractor	Track brochures distributed and pageviews	2020
Brochures/Pamphlets/Webpage	Proper Storage of Industrial Materials	Industrial Facilities	Engineering/External contractor	Track brochures distributed and pageviews	2019
Brochures/Pamphlets/Webpage	Proper Operation & Maintenance of Grounds	Industrial Facilities	Engineering/External contractor	Track brochures distributed and pageviews	2020

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

MCM 2: Public Involvement and Participation

BMP Categorization	Brief BMP Description (enter your own text to override the drop down menu)	Responsible Department/Parties (enter your own text to override the drop down menu)	Additional Description/ Measurable Goal	Beginning Year of BMP Implementation
Public Review	SWMP Review	Engineering	Allow annual review of stormwater management plan and posting of stormwater management plan on website	2019
Public Participation	SWMP Annual Public Comment Period	Engineering	Allow public to comment on stormwater management plan annually	2019
Public Participation	Hold Annual Household Hazardous Waste Day (HHWD)	DPW Operations	Hold Annual HHWD	2018
Public Participation	Stormwater Stenciling / Plaques	DPW Operations	Install 50 Per Year	2018

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

MCM 3: Illicit Discharge Detection and Elimination (IDDE)

BMP Categorization (enter your own text to override the drop down menu)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)	**Beginning Year of BMP Imple-mentation**
SSO inventory	Develop SSO inventory in accordance of permit conditions	DPW Operations / Engineering	Complete within 1 year of effective date of permit	2018
Storm sewer system map	Create map and update during IDDE program completion	Engineering	Update map within 2 years of effective date of permit and complete full system map 10 years after effective date of permit	2018
Written IDDE program	Create written IDDE program	External Contractor	Complete within 1 year of the effective date of permit and update as required	2018
Implement IDDE program	Implement catchment investigations according to program and permit conditions	Engineering/External Contractor	Complete 10 years after effective date of permit	2018
Employee training	Train employees on IDDE implementation	DPW Operations/External Contractor	Train annually	2018
Conduct dry weather screening	Conduct in accordance with outfall screening procedure and permit conditions	External Contractor	Complete 3 years after effective date of permit	2018
Conduct wet weather screening	Conduct in accordance with outfall screening procedure	External Contractor	Complete 10 years after effective date of permit	2018
Ongoing screening	Conduct dry weather and wet weather screening (as necessary)	External Contractor	Complete ongoing outfall screening upon completion of IDDE program	2029
Catchment Investigation Procedure	Written catchment investigation procedure	External Contractor	Complete in 18 months from effective date of permit	2018
Catchment Investigations	Investigate catchments with 1 or more SVF per permit	External Contractor	Investigate catchments with 1 or more SVF	2018

Continue to Update GIS	Update GIS Mapping as new structures are found in the field or as errors are identified	DPW Construction & Operations / Engineering / External Contractor	Reduction in errors identified in the field	2018

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

MCM 4: Construction Site Stormwater Runoff Control

BMP Categorization (enter your own text to override the drop down menu or entered text)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)	**Beginning Year of BMP Imple-mentation**
Site inspection and enforcement of Erosion and Sediment Control (ESC) measures	Complete written procedures of site inspections and enforcement procedures	Engineering/Conservation Commission/Planning/External Contractor / Inspectior	Complete within 1 year of the effective date of permit	2018
Site plan review	Complete written procedures of site plan review and begin implementation	Engineering/Planning/DPW Operations	Complete within 1 year of the effective date of permit	2018
Erosion and Sediment Control	Adoption of requirements for construction operators to implement a sediment and erosion control program	Engineering/Planning/DPW Operations/Conservation Commission	Complete within 1 year of the effective date of permit	2018
Waste Control	Adoption of requirements to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes	Engineering/Planning	Complete within 1 year of the effective date of permit	2018

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

MCM 5: Post-Construction Stormwater Management in New Development and Redevelopment

BMP Categorization (enter your own text to override the drop down menu or entered text)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)	**Beginning Year of BMP Imple-mentation**
As-built plans for on-site stormwater control	The procedures to require submission of as-built drawings and ensure long term operation and maintenance will be a part of the SWMP	Planning/Engineering	Require submission of as-built plans for completed projects	2018
Target properties to reduce impervious areas	Identify at least 5 permittee-owned properties that could be modified or retrofitted with BMPs to reduce impervious areas and update annually	Planning/Engineering	Complete 4 years after effective date of permit and report annually on retrofitted properties	2018
Allow green infrastructure	Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist	Conservation Commission/Engineering/Planning	Complete 4 years after effective date of permit and implement recommendations of report	2018
Street design and parking lot guidelines	Develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support low impact design options.	Engineering/Planning	Complete 4 years after effective date of permit and implement recommendations of report	2018

Ensure any stormwater controls or management practices for new development and redevelopment meet the retention or treatment requirements of the permit and all applicable requirements of the Massachusetts Stormwater Handbook	Adoption, amendment, or modification of a regulatory mechanism to meet permit requirements	Engineering/Planning	Complete 2 years after effective date of permit	2018

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

MCM 6: Municipal Good Housekeeping and Pollution Prevention

BMP Categorization (enter your own text to override the drop down menu or entered text)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)	**Beginning Year of BMP Implementation**
O&M procedures	Create written O&M procedures including all requirements contained in 2.3.7.a.ii for parks and open spaces, buildings and facilities, and vehicles and equipment	Engineering/DPW Operations/External Contractor	Complete and implement 2 years after effective date of permit	2018
Inventory all permittee-owned parks and open spaces, buildings and facilities, and vehicles and equipment	Create inventory	Engineering/DPW Operations/External Contractor	Complete 2 years after effective date of permit and implement annually	2018
Infrastructure O&M	Establish and implement program for repair and rehabilitation of MS4 infrastructure	Engineering/DPW Operations/External Contractor	Complete 2 years after effective date of permit	2018
Stormwater Pollution Prevention Plan (SWPPP)	Create SWPPPs for maintenance garages, transfer stations, and other waste-handling facilities	Engineering/DPW Operations/External Contractor	Complete and implement 2 years after effective date of permit	2018
Catch basin cleaning	Establish schedule for catch basin cleaning such that each catch basin is no more than 50% full and clean catch basins on that schedule	Engineering/DPW Operations/External Contractor	Clean catch basins on established schedule and report number of catch basins cleaned and volume of material moved annually	2018
Street sweeping program	Sweep all streets and permitee-owned parking lots in accordance with permit conditions	DPW Operations/External Contractor	Sweep all streets and permitee-owned parking lots once per year in the spring	2018
Road salt use optimization program	Establish and implement a program to minimize the use of road salt	Engineering/DPW Operations/External Contractor	Implement salt use optimization during deicing season	2018

Inspections and maintenance of stormwater treatment structures	Establish and implement inspection and maintenance procedures and frequencies	Engineering/DPW Operations/External Contractor	Inspect and maintain treatment structures at least annually	2018

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

Actions for Meeting Total Maximum Daily Load (TMDL) Requirements

Use the drop-down menus to select the applicable TMDL, action description to meet the TMDL requirements, and the responsible department/parties. If no options are applicable, or more than one, **enter your own text to override drop-down menus.**

Applicable TMDL	Action Description	Responsible Department/Parties (enter your own text to override the drop down menu)
North Coastal Watershed (Bactria/Pathogen)	Adhere to requirements in part A.III of Appendix F	Engineering / External Contractor

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary (continued)

Actions for Meeting Requirements Related to Water Quality Limited Waters

Use the drop-down menus to select the pollutant causing the water quality limitation and enter the waterbody ID(s) experiencing excursions above water quality standards for that pollutant. In addition, if you are subject to additional requirements due to a downstream nutrient impairment (see Part 2.2.2 of the permit) select the pollutant of concern and indicate applicable waterbody IDs or write "all waterbodies" if applicable. Choose the action description from the dropdown menu and indicate the responsible party. If no options are applicable, or more than one, **enter your own text to override drop-down menus.**

Pollutant	Waterbody ID(s)	Action Description	Responsible Department/Parties (enter your own text to override the drop down menu)
Fecal Coliform	MA71-14 - Belle Isle Inlet	Adhere to requirements in part III of Appendix H	External Contractor/Engineering/DPW Operations
Fecal Coliform	MA71-08 - Mill Creek	Adhere to requirements in part III of Appendix H	External Contractor/Engineering/DPW Operations
Oil and Grease	MA93-44 - Saugus River	Adhere to requirements in part V of Appendix H	External Contractor/Engineering/DPW Operations
		Adhere to requirements in part III of Appendix H	
		Adhere to requirements in part V of Appendix H	
		Adhere to requirements in part III of Appendix H	

Part IV: Notes and additional information

Use the space below to indicate the part(s) of 2.2.1and 2.2.2 that you have identified as not applicable to your MS4 because you do not discharge to the impaired water body or a tributary to an impaired water body due to nitrogen or phosphorus. Provide all supporting documentation below or attach additional documents if necessary. Also, provide any additional information about your MS4 program below.

The City of Revere has submitted the attached letter to the United States Fish and Wildlife Services on 10/2/18.

The City plans to follow the requirements from USFW as set forth in the form letter (attached) as related to certifying under criterion B

The City of Revere is located downstream of all phosphorus impairments to the Saugus River. The only impairment on the Saugus River is located near the headwaters from Lake Quannapowitt at Section MA93-34. There are no other waterways the City discharges to with an impairment for phosphorus. The City believes it is relieved from the requirements of part 2.2.2.b.i and Appendix H, part II.

The City of Revere is under a USEPA Consent Decree (1:10-cv-11460), as described in Section 2.3.4.7.b.iv, the City will utilize its historic/ ongoing catchment investigations and outfall sampling data to fulfill the requirements of this permit. This will be further discussed in the SWMP.

The City currently plans to utilize an educational video prepared in coordination with the Mystic River Watershed Association (https:// drive.google.com/drive/folders/1_-fAiHpJZI2LkoHXMkOm3od_YdV4i3ri?usp=sharing). The City is aware that additional sources of public outreach are required and as such is considering utilizing public outreach documentation prepared by Greenscapes as well as other resources moving forward. Additional public outreach efforts will be provided as supplemental information.

Over the past years, the City has provided public outreach by presenting to attendees at the Revere Beach Sandcastle Competition and through multiple notifications sent for Consent Decree purposes. For the Consent Decree, the City has provided a robust public outreach/notification program and intends to provide a similar outreach program in response to the MS4 permit.
The facility is an existing facility that was authorized by the previous permit. There are no planned activities that will affect historic properties. Therefore, this facility is eligible for coverage under NHPA Determination Criterion A.

MS4 Outfall Map Attached.

Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part V: Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Brian Arrigo

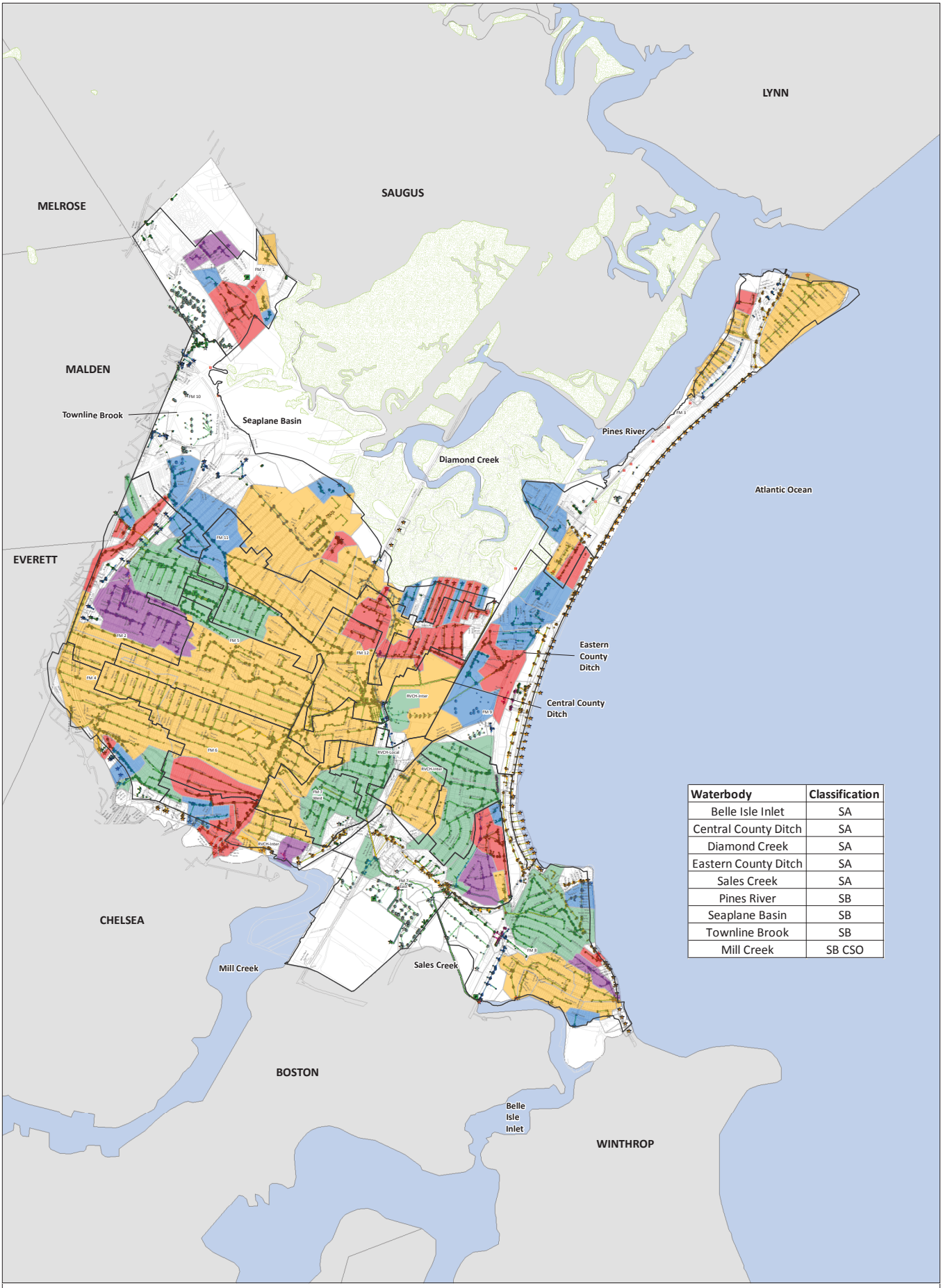
Title: Mayor

Signature: Brian Arrigo Digitally signed by Brian Arrigo Date: 2018.10.16 10:09:18 -04'00'

Date: 10/16/18

[To be signed according to Appendix B, Subparagraph B.11, Standard Conditions]

Note: When prompted during signing, save the document under a new file name



Waterbody	Classification
Belle Isle Inlet	SA
Central County Ditch	SA
Diamond Creek	SA
Eastern County Ditch	SA
Sales Creek	SA
Pines River	SB
Seaplane Basin	SB
Townline Brook	SB
Mill Creek	SB CSO

Legend

Drain System
- Drain Manhole
- Outfall
- Pump Station
- Intake
- Headwall
- Catch Basin
- Culvert
- Ditch
- Tide Gates

Drain Sytem by Ownership
- Revere
- DCR
- MassDOT
- MBTA
- Other

Basemap
- Wetland
- Water
- Parcels

IDDE Investigation Year
- 1
- 2
- 3
- 4
- 5
- Not determined
- Sewer FM

FIGURE 3-5
PROPOSED IDDE INVESTIGATION PROGRAM
SUPPLEMENTAL CWMP/CSMP
CITY OF REVERE
AUGUST 2015

0 500 1,000 2,000
Feet
1 inch = 1,000 feet

CDM Smith

ZEMERMD \\dacgis02\Projects\Revere\MXDs\IDDE_2015\Proposed_IDDE_Figure_3_5.mxd 8/31/2015

CDM Smith
670 North Comercial Street, Suite 208
Manchester, New Hampshire 03101
tel: 603-222-8322

October 2, 2018

U.S. Fish and Wildlife Service
New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301

Subject: Project Review Request, City of Revere MS4, Revere, Massachusetts, SLI Number: 05E1NE00-2019-SLI-0006

Dear Reviewer:

We have reviewed the referenced project using the Environmental Protection Agency's (EPA) project review process for our Municipal Separate Storm Sewer System (MS4) and have followed all guidance and instructions in completing the review. We completed our review on October 1, 2018 and are submitting our project package in accordance with the instructions for further review. The U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) species list indicated these species may be present in the City of Revere, Massachusetts (City) project area: Northern Long Eared Bat, Piping Plover, Red Knot, and Roseate Tern. We are submitting this letter as a non-Federal representative of the EPA pursuant to the requirements of the EPA's process for NPDES/MS4 permits.

Our proposed action consists of implementation of a series of non-structural BMPs (e.g. improved drainage system maintenance, implementation of local ordinances/by-lays to control erosion and sedimentation, illicit discharge detection and eliminations program, and implementation of public outreach programs) to protect and improve the quality of stormwater conveyed to receiving water via the existing municipal drainage system. These non-structural BMPs will not adversely affect the water quality of the local receiving waters, but rather will improve water quality over the long term. Therefore, it is our opinion that the City is eligible for coverage pursuant to the Permit. We respectfully request written concurrence from the USFWS that the continued discharge of municipal stormwater to the receiving waters via the existing municipal drainage system *may affect or is not likely to adversely affect* to federally protected endangered or threatened species. In the future, if the City determines structural BMPs are required to improve water quality, a separate request will be made to the USFWS as part of that specific project. In order to meet EPA-mandated submission requirements we would appreciate a response As Soon As Possible. The location action area is identified on the enclosed map.

Permit implementation will begin in the fall of 2018 and the permit has an expiration date of June 30, 2022.

This is a request for review by the Service pursuant to section 7 of the Endangered Species Act. We determined that the project may affect but is not likely to adversely affect the above listed species, because these non-structural BMPs will not adversely affect the water quality of the local receiving waters, but rather will improve water quality over the long term. Species are further identified below with specific information regarding the project impacts to each.

- Northern Long-eared Bat (*Myotis Septentrionalis*) – The project proposes implementation of non-structural efforts to improve stormwater discharge quality and will not impact the environments utilized by the norther long-eared bat.
- Piping Plover (*Charadrius Melodus*) – Discharges from proposed projects may reach the environments utilized by the piping plover. However, BMPs will be implemented throughout the City to reduce pollutants to the extent practicable and the discharges are not known to have any measurable impacts on piping plovers, the fish they eat, or their habitat.
- Red Knot (*Calidris Canutus Rufa*) – Discharges from proposed projects may reach the environments utilized by the red knot. However, BMPs will be implemented throughout the City to reduce pollutants to the extent practicable and the discharges are not known to have any measurable impacts on red knots, the fish they eat, or their habitat.
- Roseate Tern (*Sterna Dougallii Dougallii*) – Discharges from proposed projects may reach the environments utilized by the roseate tern. However, BMPs will be implemented throughout the City to reduce pollutants to the extent practicable and the discharges are not known to have any measurable impacts on roseate terns, the fish they eat, or their habitat.

The enclosed project package provides the information about the species and/or critical habitat considered in our review, and we identified our determinations for the resources that may be affected by the project. We request you concur with our determination that the project may affect but is not likely to adversely affect the species described above. For additional information, please contact me at the address listed above, by phone at 603-222-8322, or garveyk@CDMSmith.com.

Sincerely,

Kevin Garvey, PE
CDM Smith Inc.

Enclosures: List of Threatened or Endangered Species from USFWS
Revere, MA Designated MS4 Areas

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To:
Consultation Code: 05E1NE00-2019-SLI-0006
Event Code: 05E1NE00-2019-E-00014
Project Name: Revere, Mass MS4 NOI

October 01, 2018

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2019-SLI-0006

Event Code: 05E1NE00-2019-E-00014

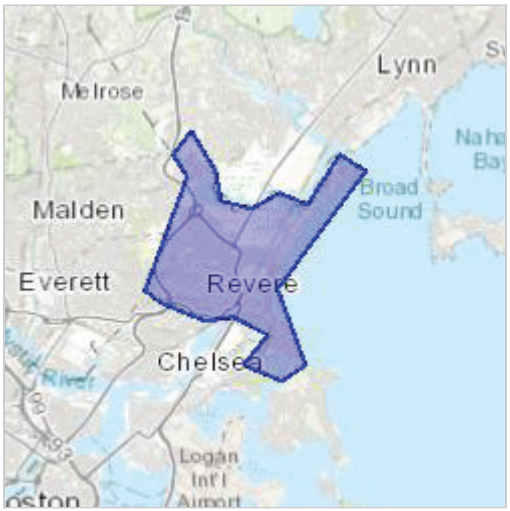
Project Name: Revere, Mass MS4 NOI

Project Type: Guidance

Project Description: City of Revere's MS4 Notice of Intent to Discharge

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.41857600320323N71.00586964155188W



Counties: Essex, MA | Middlesex, MA | Suffolk, MA

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

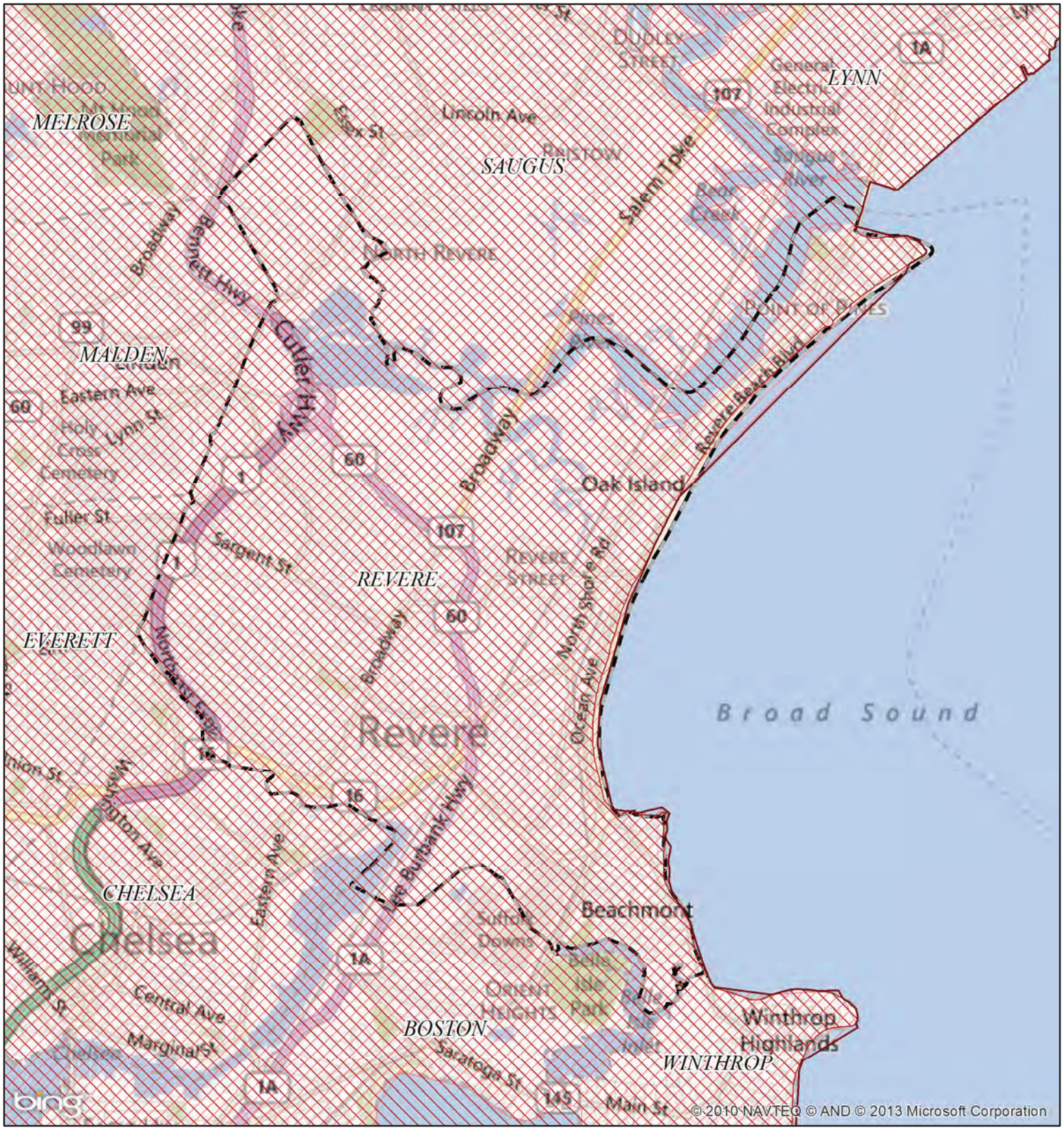
NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

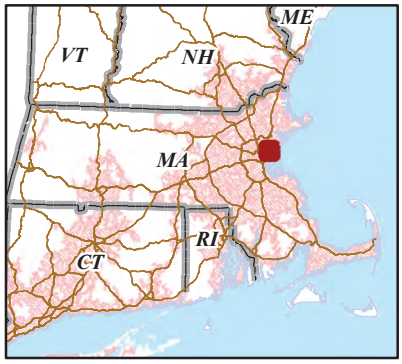
Birds

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern *Sterna dougallii dougallii* Population: northeast U.S. nesting pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.





NPDES Phase II Stormwater Program
Automatically Designated MS4 Areas
Revere MA

Regulated Area:

UA Based on 2000 Census | UA Based on 2010 Census

0 1 2 Kilometers

0 1 2 Miles

Town Population: **51687**

Regulated Population: **51687**

(Populations estimated from 2010 Census)

N W E S

EPA

Urbanized Areas, Town Boundaries:
US Census (2000, 2010)
Base map © 2013 Microsoft Corporation
and its data suppliers

US EPA Region 1 GIS Center Map #8824, 8/9/2013

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial St, Suite 300
Concord, NH 03301-5087
http://www.fws.gov/newengland

September 24, 2018

To whom it may concern:

The U.S. Fish and Wildlife Service (USFWS) reviewed the stormwater discharge activities associated with the 2016 National Pollutant Discharge and Elimination System (NPDES) Massachusetts (MA) Small Municipal Separate Storm Sewer System (MS4) general permit (MA MS4 General Permit) issued by the Environmental Protection Agency (EPA). We determined those activities may affect, but are not likely to adversely affect, certain species listed under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) when specific conditions are met. When these conditions are met, we do not need to review individual projects. These comments are provided in accordance with section 7 of the ESA and complement existing 2016 MA MS4 General Permit Appendix C Guidance. We understand the applicant is acting as a non-Federal representative of the EPA for the purpose of consultation under section 7. **This letter provides additional guidance for meeting Criterion B and should be submitted as part of your application package to the EPA.**

If the USFWS Information for Planning and Consultation website (https://ecos.fws.gov/ipac/) indicates your MA MS4 General Permit project action area may contain one or more of the following federally listed endangered species: roseate tern (*Sterna dougallii*), northern red-bellied cooter (*Pseudemys rubriventris*), dwarf wedgemussel (*Alasmidonta heterodon*), rusty patched bumble bee (*Bombus affinis*), northeastern bulrush (*Scirpus ancistrochaetus*), or American chaffseed (*Schwalbea americana*); threatened species: piping plover (*Charadrius melodus*), bog turtle (*Glyptemys muhlenbergii*), Puritan tiger beetle (*Cicindela puritana*), northeastern beach tiger beetle (*Cicindela dorsalis*), or red knot (*Calidris canutus rufa*); or their federally designated critical habitat; and the specific conditions listed below are met, you may submit this letter to complete the **MA MS4 General Permit Appendix C: Step 4** in place of a concurrence letter for informal consultation as documentation of ESA eligibility for **USFWS Criterion B**.

In addition, this letter also satisfies the requirement in the **MA MS4 General Permit Appendix C: Step 2 (3)** to contact the USFWS and obtain a concurrence letter, if you have not yet done so. If your project action area includes one or more of the above-listed species *and* one or more of the

species listed under **Criterion C,**[1] you may still use this letter to certify under **Criterion B**. All existing guidance regarding requirements for certifying eligibility according to the USFWS Criterion A, B, or C for coverage by the 2016 MS4 Permit (see MA MS4 General Permit Appendix C – Endangered Species Guidance) remains unchanged.

We have determined that proposed stormwater discharge activities covered under the 2016 MS4 Permit *may affect, but are not likely to adversely affect*, the above-listed species and the species' critical habitat when the following are true:

1. all stormwater discharges are pre-existing or previously permitted by EPA;
2. any planned operations and maintenance work covered by this permit will only affect previously disturbed areas where stormwater controls are already installed. In these situations the chance of encountering any of the subject species is discountable;
3. the project implements EPA MS4 Best Management Practices (BMPs) and meets Clean Water Act and Massachusetts Water Quality Standards. Although permitted discharges may reach the environment used by these species, BMPs reduce pollutants to the extent that discharges are not known to have measurable impacts on these species or their habitat;
4. no new construction or structural BMPs are proposed under this permit at this time; and
5. you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the Notice of Intent (NOI), you will re-initiate consultation with the USFWS as necessary (see **MA MS4 General Permit Appendix C: Step 2 (5)**).

If the above criteria are met, further consultation with the USFWS under section 7 of the ESA is not required at this time; however, if the proposed action changes in any way such that it may affect a listed species in a manner not previously analyzed or if new information reveals the presence of additional listed species that may be affected by the project, the applicant or the EPA should contact us immediately and suspend activities that may affect those species until the appropriate level of consultation is completed with our office. Thank you for your cooperation, and please contact David Simmons of this office at (603) 227-6425 if you have questions or need further assistance.

Sincerely yours,

Thomas R Chapman
Supervisor
New England Field Office

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[1] Criterion C includes guidance for project action areas that may contain species for which EPA has already made a determination. These species include the northern long-eared bat (*Myotis septentrionalis*), sandplain gerardia (*Agalinis acuta*), small whorled pogonia (*Isotria medeoloides*), and/or American burying beetle (*Nicrophorus americanus*) (MA MS4 General Permit Appendix C: Step 3 – Determine if You Can Meet Eligibility USFWS Criterion C).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

VIA EMAIL

March 5, 2019

Brian Arrigo
Mayor

And;

Nicholas Rystrom
City Engineer
281 Broadway
Revere, MA. 02151
nrystrom@revere.org

Re: National Pollutant Discharge Elimination System Permit ID #: MAR041057, City of Revere

Dear Nicholas Rystrom:

The 2016 NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts (MS4 General Permit) is a jointly issued EPA-MassDEP permit. Your Notice of Intent (NOI) for coverage under this MS4 General Permit has been reviewed by EPA and appears to be complete. You are hereby granted authorization by EPA and MassDEP to discharge stormwater from your MS4 in accordance with the applicable terms and conditions of the MS4 General Permit, including all relevant and applicable Appendices. This authorization to discharge expires at midnight on **June 30, 2022.**

For those permittees that certified Endangered Species Act eligibility under Criterion C in their NOI, this authorization letter also serves as EPA's concurrence with your determination that your discharges will have no effect on the listed species present in your action area, based on the information provided in your NOI.

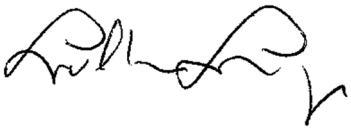
As a reminder, your first annual report is due by **September 30, 2019** for the reporting period from May 1, 2018 through June 30, 2019.

Information about the permit and available resources can be found on our website: https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit. Should you have any questions regarding this permit please contact Newton Tedder at tedder.newton@epa.gov or (617) 918-1038.

Sincerely,

Thelma Murphy, Chief
Stormwater and Construction Permits Section
Office of Ecosystem Protection
United States Environmental Protection Agency, Region 1

and;



Lealdon Langley, Director
Wetlands and Wastewater Program
Bureau of Water Resources
Massachusetts Department of Environmental Protection

APPENDIX E

2003 MS4 Annual Reports Reference

2003 MS4 PERMIT ANNUAL REPORTS REFERENCE

Year 2 Annual Report (2004-2005)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2005/RevereMA05.pdf

Year 3 Annual Report (2005-2006)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2006/Revere06rpt.pdf

Year 4 Annual Report (2006-2007)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2007/Revere07ar.pdf

Year 6 Annual Report (2008-2009)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2009/Revere09.pdf

Year 7 Annual Report (2009-2010)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2010/Revere10.pdf

Year 8 Annual Report (2010-2011)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2011/Revere11.pdf

Year 9 Annual Report (2011-2012)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2012/Revere12.pdf

Year 10 Annual Report (2012-2013)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2013/Revere13.pdf

Year 11 Annual Report (2013-2014)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2014/Revere14.pdf

Year 12 Annual Report (2014-2015)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2015/Revere15.pdf

Year 13 Annual Report (2015-2016)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2016/Revere16.pdf

Year 14 Annual Report (2016-2017)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2017/Revere17.pdf

Year 15 Annual Report (2017-2018)
https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/ma/reports/2018/Revere18.pdf

APPENDIX F

MS4 Checklists by Permit Year

Checklist for Year 1 MS4 Permit Requirements – Revere, MA

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
10/1/2018	Notice of Intent (NOI)	Prepare and Submit NOI for Permit Coverage 90 days from the permit effective date	1.7.2 & Appendix E	Yes
6/30/2019	Stormwater Management Plan (SWMP)	Develop written SWMP	1.10	Yes
6/30/2019	Public Education	Fulfill public education initiatives aimed at target audiences as outlined in the City's NOI and this SWMP	2.3.2	Yes
6/30/2019	Public Participation	Fulfill public participation initiatives aimed at target audiences as outlined in the City's NOI and this SWMP	2.3.3	Yes
6/30/2019	Illicit Discharge Detection and Elimination (IDDE) Plan	Develop written IDDE plan to satisfy permit requirements.	2.3.4.6	Yes
6/30/2019	Catchment Delineation	Delineate outfall & interconnection catchment areas.	2.3.4.5	*Yes
6/30/2019	Catchment Prioritization & Ranking	Assess and rank the potential for all catchments to have illicit discharges.	2.3.4.7	*Yes
6/30/2019	IDDE Employee Training	Continue to train municipal employees on illicit discharge detection and monitoring.	2.3.4.11	No
6/30/2019	Construction Site Runoff Control Regulatory Updates/SOPs	Create written procedures for inspection of construction sites for proper sediment & erosion controls, and conducting site plan reviews. Incorporate requirements for waste control. Reference Stormwater Manual for Sediment & Erosion Control BMPs.	2.3.5.c	Yes
6/30/2019	Street Sweeping	Sweep streets a minimum of once a year in the spring. Include miles cleaned or volume or mass of material removed in the annual report.	2.3.7.a.iii.3	Yes

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2019	Catch Basin Cleaning	Clean catch basins annually to ensure the no catch basin is more than 50% full. Report catch basins cleaned and volume of material removed annually.	2.3.7.a.iii.3	Yes
6/30/2019	Winter Road Maintenance SOP	Develop and implement winter road maintenance procedures including use and storage of sand/salt, and snow storage practices.	2.3.7.a.iii.5	Yes
6/30/2019	Stormwater BMP Inspection & Maintenance	Inspect all stormwater treatment structures (BMPs) at least annually and conduct maintenance as necessary. Track number of structures maintained and inspected annually.	2.3.7.a.iii.6	N/A (No City-owned stormwater treatment structures/ BMPs identified yet)

* As described in section 5.2 of the SWMP – The priority status is determined by the progress achieved since the IDDE program beginning in 2010.

Checklist for Year 2 MS4 Permit Requirements – Revere, MA

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2020	Stormwater Management Plan (SWMP)	Update written SWMP	1.10	Yes
6/30/2020	Public Education	Fulfill public education initiatives aimed at target audiences as outlined in the City's NOI and this SWMP	2.3.2	No
6/30/2020	Public Participation	Fulfill public participation initiatives aimed at target audiences as outlined in the City's NOI and this SWMP	2.3.3	Yes
6/30/2020	Update Drainage Map	Update city-wide MS4 mapping to include impaired waters, BMPs, interconnections, and open channel conveyances.	2.3.4.5	Yes
6/30/2020	IDDE Employee Training	Continue to train municipal employees on illicit discharge detection and monitoring.	2.3.4.11	Yes
6/30/2025	IDDE Investigation of Problem Catchments	Begin investigation of problem catchments	2.3.4.8.a	Yes
6/30/2020	Post-Construction Stormwater Runoff Control Regulatory Updates	Update existing stormwater regulations as needed to include compliance with the Stormwater Management Standards, to meet retention and treatment requirements, to meet as-built requirements and provide for long term operation & maintenance of BMPs.	2.3.6.a.ii	No
6/30/2020	Inventory of Municipal Facilities	Develop an inventory of all permittee-owned facilities.	2.3.7.a.ii	Yes
6/30/2020	Operation and Maintenance Procedures	Develop a written set of O&M procedures for municipal facilities, activities and MS4 infrastructure	2.3.7.a.i & 2.3.7.a.iii	Yes
6/30/2020	Stormwater Pollution Prevention Plans (SWPPP)	Develop written SWPPPs for municipal waste handling facilities.	2.3.7.b	Yes
6/30/2020	Street Sweeping	Sweep streets a minimum of once a year in the spring. Include miles cleaned or volume or mass of material removed in the annual report.	2.3.7.a.iii.3	Yes

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2020	Catch Basin Cleaning Optimization	Develop and implement a catch basin cleaning schedule with a goal of ensuring no catch basin is more than 50 % full. Document catch basins inspected and cleaned, including total mass removed and proper disposal.	2.3.7.a.iii.2	No
6/30/2020	Stormwater BMP Inspection & Maintenance	Inspect all stormwater treatment structures (BMPs) at least annually and conduct maintenance as necessary. Track number of structures maintained and inspected annually.	2.3.7.a.iii.6	N/A

Checklist for Year 3 MS4 Permit Requirements – Revere, MA

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2021	Stormwater Management Plan (SWMP)	Update written SWMP	1.10	Yes
6/30/2021	Public Education	Fulfill public education initiatives aimed at target audiences as outlined in the City's NOI and this SWMP	2.3.2	No
6/30/2021	Public Participation	Fulfill public participation initiatives aimed at target audiences as outlined in the City's NOI and this SWMP	2.3.3	Yes
6/30/2021	Update Drainage Map	Update city-wide drainage mapping as needed to include MS4 infrastructure.	2.3.4.5	Yes
6/30/2021	IDDE Employee Training	Continue to train municipal employees on illicit discharge detection and monitoring.	2.3.4.11	Yes
6/30/2021	Dry Weather Outfall Screening and Sampling	Sample all outfalls and interconnections (excluding problem outfalls and excluded outfalls) for dry weather flow and sample flow if present.	2.3.4.7.b	Yes
6/30/2021	Update Catchment Ranking	Update catchment ranking and prioritization based on dry weather outfall sampling data.	2.3.4.7.b.iii.c.iii	Yes
6/30/2025	Continue IDDE Investigation of Problem Catchments	Continue investigation of problem catchments	2.3.4.8.a	Yes
6/30/2028	Begin IDDE Investigation of High and Low Priority Catchments	Begin investigation of high and low priority catchments	2.3.4.8.a	Yes
6/30/2021	Street Sweeping	Sweep streets a minimum of once a year in the spring. Include miles cleaned or volume or mass of material removed in the annual report.	2.3.7.a.iii.3	Yes
6/30/2021	Catch Basin Cleaning	Clean catch basins annually to ensure the no catch basin is more than 50% full. Report catch basins cleaned and volume of material removed annually.	2.3.7.a.iii.3	Yes

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2021	Stormwater BMP Inspection & Maintenance	Inspect all stormwater treatment structures (BMPs) at least annually and conduct maintenance as necessary. Track number of structures maintained and inspected annually.	2.3.7.a.iii.6	N/A

Checklist for Year 4 MS4 Permit Requirements – Revere, MA

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2022	Stormwater Management Plan (SWMP)	Update written SWMP	1.10	Yes
6/30/2022	Public Education	Fulfill public education initiatives aimed at target audiences as outlined in the City's NOI and this SWMP	2.3.2	No
6/30/2022	Public Participation	Fulfill public participation initiatives aimed at target audiences as outlined in the City's NOI and this SWMP	2.3.3	Yes
6/30/2022	Update Drainage Map	Update city-wide drainage mapping as needed to include MS4 infrastructure.	2.3.4.5	Yes
6/30/2022	IDDE Employee Training	Continue to train municipal employees on illicit discharge detection and monitoring.	2.3.4.11	Yes
6/30/2025	Continue IDDE Investigation of Problem Catchments	Continue investigation of problem catchments	2.3.4.8.a	Yes
6/30/2028	Continue IDDE Investigation of High and Low Priority Catchments	Continue investigation of high and low priority catchments	2.3.4.8.a	Yes
6/30/2028	Begin Wet Weather Outfall Screening and Sampling	Begin sampling outfalls and interconnections with System Vulnerability Factors during wet weather	2.3.4.8.c	Yes
6/30/2022	Street Design and Parking Lot Guidelines	Develop a report assessing requirements that affect the creation of impervious cover to determine if design standards for streets and parking lots can be modified to support low impact design options.	2.3.6.b	Yes
6/30/2022	Green Infrastructure Practices	Develop a report assessing the barriers and incentives for Green Infrastructure/LID techniques.	2.3.6.c	Yes
6/30/2022	BMP Retrofit Identification	Identify 5 permittee-owned properties that could be retrofitted with stormwater BMPs.	2.3.6.d	Yes
6/30/2022	Street Sweeping	Sweep streets a minimum of once a year in the spring. Include miles cleaned or volume or mass of material removed in the annual report.	2.3.7.a.iii.3	Yes

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2022	Catch Basin Cleaning	Clean catch basins annually to ensure the no catch basin is more than 50% full. Report catch basins cleaned and volume of material removed annually.	2.3.7.a.iii.3	Yes
6/30/2022	Stormwater BMP Inspection & Maintenance	Inspect all stormwater treatment structures (BMPs) at least annually and conduct maintenance as necessary. Track number of structures maintained and inspected annually.	2.3.7.a.iii.6	N/A

Checklist for Year 5 MS4 Permit Requirements – Revere, MA

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2023	Stormwater Management Plan (SWMP)	Update written SWMP	1.10	Yes
6/30/2023	Public Education	Fulfill public education initiatives aimed at target audiences as outlined in the City's NOI and this SWMP	2.3.2	Yes
6/30/2023	Public Participation	Fulfill public participation initiatives aimed at target audiences as outlined in the City's NOI and this SWMP	2.3.3	Yes
6/30/2023	Update Drainage Map	Update city-wide drainage mapping as needed to include MS4 infrastructure.	2.3.4.5	Yes
6/30/2023	IDDE Employee Training	Continue to train municipal employees on illicit discharge detection and monitoring.	2.3.4.11	Yes
6/30/2025	Continue IDDE Investigation of Problem Catchments	Continue investigation of problem catchments	2.3.4.8.a	No
6/30/2028	Continue IDDE Investigation of High and Low Priority Catchments	Continue investigation of high and low priority catchments	2.3.4.8.a	No
6/30/2028	Continue Wet Weather Outfall Screening and Sampling	Begin sampling outfalls and interconnections with System Vulnerability Factors during wet weather	2.3.4.8.c	Yes
6/30/2023	Street Sweeping	Sweep streets a minimum of once a year in the spring. Include miles cleaned or volume or mass of material removed in the annual report.	2.3.7.a.iii.3	Yes
6/30/2023	Catch Basin Cleaning	Clean catch basins annually to ensure the no catch basin is more than 50% full. Report catch basins cleaned and volume of material removed annually.	2.3.7.a.iii.3	Yes
6/30/2023	Stormwater BMP Inspection & Maintenance	Inspect all stormwater treatment structures (BMPs) at least annually and conduct maintenance as necessary. Track number of structures maintained and inspected annually.	2.3.7.a.iii.6	Yes (City-owned structural BMPs identified during PY5.)

Checklist for Year 6 MS4 Permit Requirements – Revere, MA

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
6/30/2024	Stormwater Management Plan (SWMP)	Update written SWMP	1.10	Yes
6/30/2024	Bacteria Impaired Water Bodies	Implement public education initiatives	H.III.2.a.i	Yes
6/30/2024	Oil and Grease, TSS, and Turbidity Impaired Water Bodies	Increase frequency of sweeping of public streets and municipal parking lots to a schedule determined by the Town to target areas with potential for high pollutant loads and large amounts of impervious area; Prioritize inspection and maintenance of catch basins to ensure that no sump is more than 50% full, and cleaning of catch basins more frequently if inspection and maintenance activities indicate excessive sediment and debris loadings.	H.V.2.a.ii	Yes
6/30/2024	Public Education	Fulfill public education initiatives aimed at target audiences as outlined in the Town's NOI and this SWMP	2.3.2	Yes
6/30/2024	Public Participation	Fulfill public participation initiatives aimed at target audiences as outlined in the Town's NOI and this SWMP	2.3.3	Yes
6/30/2024	Update Drainage Map	Update town-wide drainage mapping as needed to include MS4 infrastructure.	2.3.4.5	Yes
6/30/2024	IDDE Employee Training	Continue to train municipal employees on illicit discharge detection and monitoring.	2.3.4.11	Yes
6/30/2025	Continue IDDE Investigation of Problem Catchments	Continue investigation of problem catchments	2.3.4.8.a	Yes
6/30/2028	Continue IDDE Investigation of High and Low Priority Catchments	Continue investigation of high and low priority catchments	2.3.4.8.a	Yes
6/30/2028	Continue Wet Weather Outfall	Begin sampling outfalls and interconnections with System	2.3.4.8.c	Yes

Completion Due Date	Requirement	Task	Permit Section for Reference	Completed?
	Screening and Sampling	Vulnerability Factors during wet weather		
6/30/2024	Street Sweeping	Sweep streets a minimum of once a year in the spring. Include miles cleaned or volume or mass of material removed in the annual report.	2.3.7.a.iii.3	Yes
6/30/2024	Catch Basin Cleaning	Clean catch basins annually to ensure the no catch basin is more than 50% full. Report catch basins cleaned and volume of material removed annually.	2.3.7.a.iii.3	Yes
6/30/2024	Stormwater BMP Inspection & Maintenance	Inspect all stormwater treatment structures (BMPs) at least annually and conduct maintenance as necessary. Track number of structures maintained and inspected annually.	2.3.7.a.iii.6	Yes.

APPENDIX G

Public Education Materials

BAG YOUR LEAVES

Bag Your Leaves

Keep our rivers, lakes, ponds, and streams clean -- Bag Your Leaves!

Bag or compost your leaves, but do not rake them into the street or dump them down storm drains! Blocking storm drains can cause flooding, and large amounts of leaves in our water can lead to an excess of decaying organic material in waterways with results that are harmful to both humans and animals.

Why do leaves cause water pollution?

Left on land, leaves decompose, feeding your plants and enriching your soil. But when large amounts of leaves are washed off our lawns, down our driveways, into storm drains, and into our water bodies -- they release phosphorus and nitrogen into our water, contributing to water pollution.

These elevated levels of nutrients in our water:

- Cause "blue-green algae", or cyanobacteria blooms, which are toxic to both humans and wildlife and are considered a public health hazard
- Kill fish through the depletion of oxygen in the water, called "eutrophication"
- Cause the growth of large amounts of algae and invasive plants, choking up the waterway

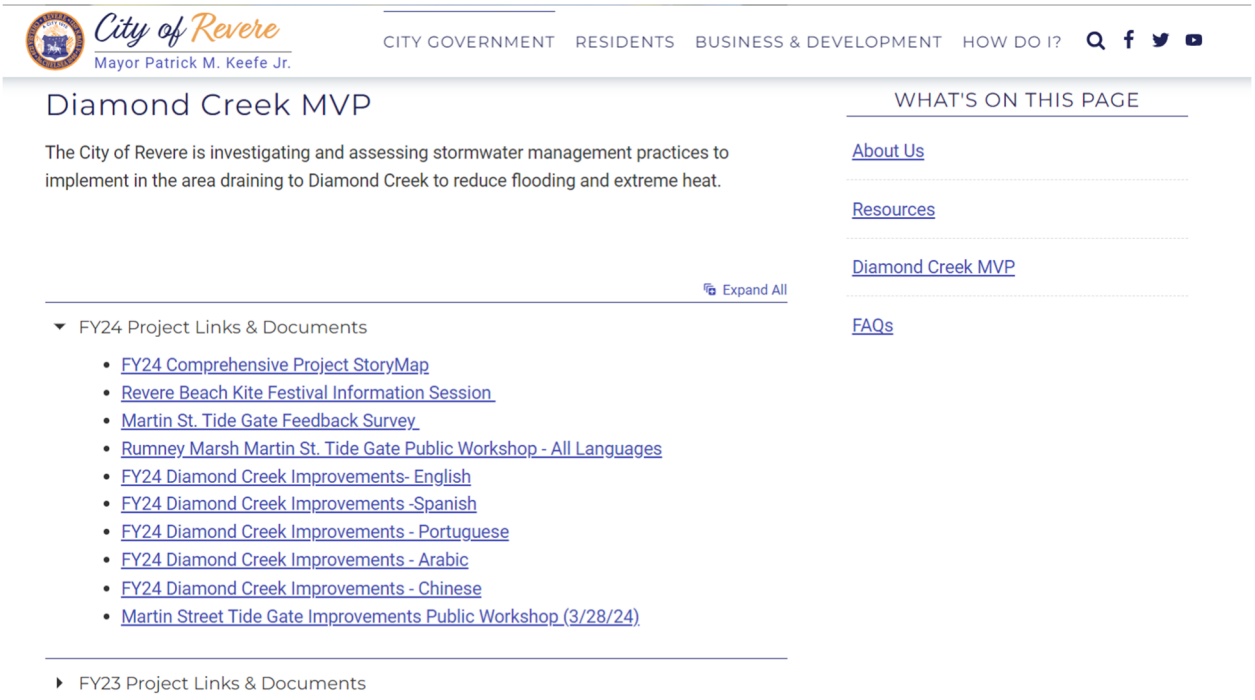
What can YOU do?

Keep leaves out of the storm drain and your rivers, lakes, and ponds!

- Bag your leaves for curbside pick-up.
- Mix your leaves into your compost pile, creating a nutrient-rich fertilizer for your plants.
- Use a mulching mower and create mulch from your leaves to use in flower beds.

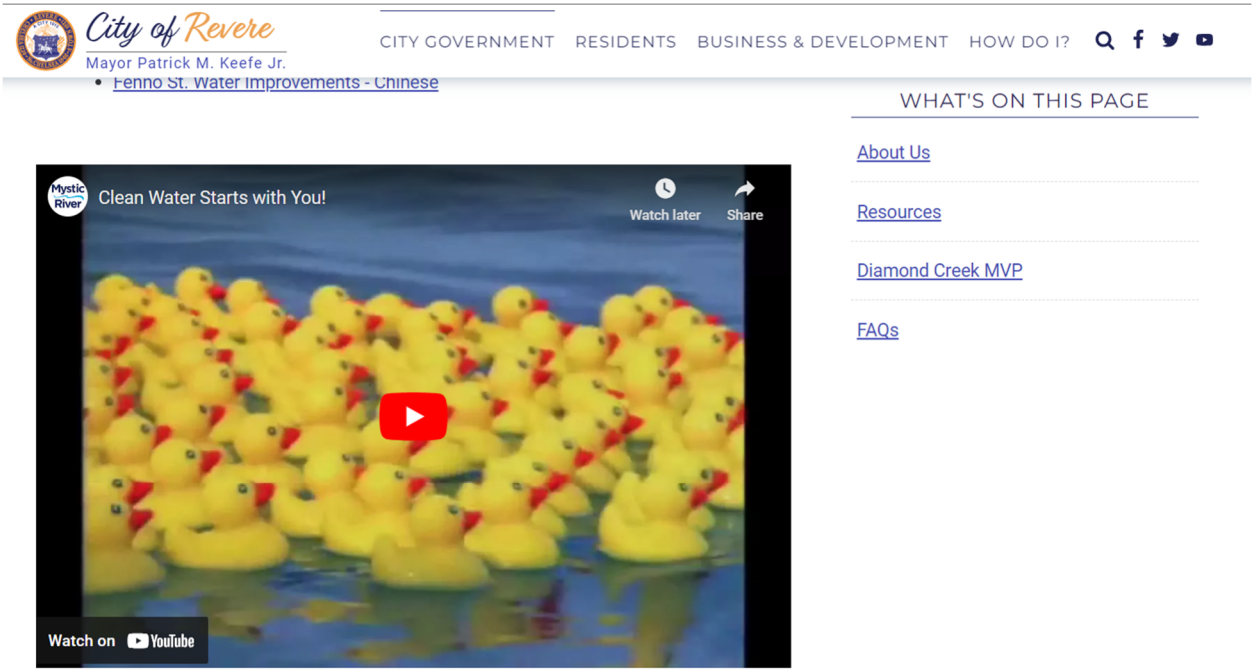
https://www.revere.org/departments/engineering

DIAMOND CREEK MVP RESOURCES



https://www.revere.org/departments/engineering#mvp

THINK BLUE MASSACHUSETTS



https://www.revere.org/departments/engineering

BE KIND

Don't leave poop behind!

THE POOP PROBLEM

When pet waste is left behind, it can wash into storm drains when it rains — going directly to the Mystic River and other waterways **untreated.** Pet waste can lower the water quality through:

EXCESS NUTRIENTS

Pet waste contains nutrients that encourage excess weed and algae blooms.

↓ OXYGEN, ↑ AMMONIA

Decaying pet waste uses up oxygen and sometimes releases ammonia. Low oxygen levels and increased ammonia combined with warm temperatures can kill fish and other aquatic life.

DISEASES & BACTERIA

Pet waste can carry diseases and bacteria that are unsafe for humans.

For Clean Water, Scoop the Poop!

Mystic River WATERSHED ASSOCIATION

mysticriver.org/stormwater

Tips adapted from jacksonville.gov/scoopthepoop and Chad Logan's Pick Up That Poo Campaign

¡SÉ AMABLE Y RESPONSABLE!

¡Recoge las heces de tu mascota!

EL PROBLEMA DE LAS HECES

Cuando se deja el excremento de las mascotas en el suelo, puede ser arrastrado por el agua de lluvia hacia los desagües pluviales, llegando directamente a Mystic River y otros cuerpos de agua sin tratamiento. El excremento de las mascotas puede afectar la calidad del agua de las siguientes maneras:

POR NUTRIENTES EN EXCESO

El excremento de las mascotas contiene nutrientes que promueven el crecimiento excesivo de malezas y algas.

↓ OXÍGENO, ↑ AMONIACO

El excremento en descomposición de las mascotas consume oxígeno y a veces libera amoníaco. Los bajos niveles de oxígeno y el aumento de amoníaco, combinados con las altas temperaturas, pueden ocasionar la muerte de peces y otros organismos acuáticos.

POR ENFERMEDADES Y BACTERIAS

El excremento de las mascotas puede transmitir enfermedades y bacterias que representan un riesgo para los humanos.

¡Por Agua Pura, Recoge la Basura!

Mystic River WATERSHED ASSOCIATION

mysticriver.org/stormwater

Consejos adaptados de jacksonville.gov/scoopthepoop y la Campaña Recoge Esas Heces, de Chad Logan

RETE JANTI

Pa kite poupou dèyè!

PWOBLEM POUPOU A

Lè poupou bèt domestik rete deyè, li ka lave nan drenaj tanpèt yo lè lapli tonbe - ale dirèkteman nan Mystic River ak lòt vwa dlo yo san trete. Poupou bèt domestik ka diminye kalite dlo a atravè:

EKSÈ ELEMAN NITRITIF

Poupou bèt domestik gen eleman nitritif ki ankouraje raje ak alg fleri an eksè.

↓ OXYGEN, ↑ AMONYAK

Poupou bèt domestik ki pouri yo itilize oksijèn epi pafwa degaje amonyak. Nivo oksijèn ki ba ak ogmantasyon amonyak avèk tanperati cho ka touye pwason ak lòt òganis akwatik.

MALADI AK BAKTERI

Poupou bèt domestik ka pote maladi ak bakteri ki danje pou imen.

Pou Dlo Pwòp, Ranmase Poupou a!

Mystic River WATERSHED ASSOCIATION

mysticriver.org/stormwater

Konsèy ki soti nan jacksonville.gov/scoopthepoop ak kanpay "Ranmase PouPou" Chad Logan nan

敬请与人为善！

不要留下宠物粪便不管！

粪便问题

宠物粪便如被弃之不管时，天一下雨，粪便就会被冲进雨水管道系统里，未经过任何处理就直接流入神秘河和其他水道里。宠物粪便可能通过以下方式降低水质：

营养过量

宠物粪便含有促进杂草和藻类过旺生长的营养物质。

↓ 氧气，↑ 氨

腐烂的宠物粪便会消耗氧气，有时还释放氨气。氧气含量下降、氨气量上涨，再加上温度升高，即会导致鱼类和其他水生生物死亡。

各种疾病及细菌

宠物粪便可能携带对人体不安全的各种疾病及细菌。

为了水源清洁，请拾起宠物粪便！

Mystic River WATERSHED ASSOCIATION

mysticriver.org/stormwater

小贴士改编于jacksonville.gov/scoopthepoop和Chad Logan的“捡起那块粪便的运动（Pick Up That Poo）”。

APPENDIX H

Regulatory Mechanisms

Chapter 13.10 - STORMWATER MANAGEMENT

Sections:

13.10.010 - Discharges to the municipal drain system.

A. Purpose.

1. The purpose of this section is to eliminate non-stormwater discharges to the city of Revere's municipal storm drain system (storm drain). Non-stormwater discharges contain contaminants and supply additional flows to the city of Revere's storm drain system. Non-stormwater discharges are major causes of:
   a. Impairment of water quality and flow in oceans, lakes, ponds, streams, rivers, wetlands, and groundwater;
   b. Contamination of drinking water supplies;
   c. Alteration or destruction of aquatic and wildlife habitat; and
   d. Flooding.
2. Regulation of illicit connections and discharges to the storm drain system is necessary for the protection of the city of Revere's natural resources, municipal facilities, general health, safety, welfare, and the environment.
3. The objectives of this section are:
   a. To prevent pollutants from entering the storm drain;
   b. To prohibit illicit connections and unauthorized discharges to the storm drain;
   c. To remove all such illicit connections;
   d. To comply with state and federal statutes and regulations relating to stormwater discharges; and
   e. To establish the legal authority to ensure compliance with the provisions of this section through inspection, monitoring, and enforcement.

B. Definitions. For purposes of this section:

1. "Authorized enforcement agency" means the department of public works (hereafter DPW) and the department of municipal inspections and their employees or agents designated to enforce this chapter.
2. "Best management practice (BMP)" means an activity, procedure, restraint, or structural improvement that helps reduce the quantity or improve the quality of stormwater runoff.
3. "Clean Water Act" means the Federal Water Pollution Control Act (33 U.S.C. Section 1251 et seq.) and as it is amended from time to time.

4. "Discharge of pollutants" means the addition from any source of any pollutant or combination of pollutants into the storm drain or into waters of the United States or commonwealth from any source.
5. "Groundwater" means water beneath the surface of the ground, except where the water under the ground is the result of a perched water table.
6. "Illicit connection" means a surface or subsurface drain or conveyance, which allows an illicit discharge into the 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 the ordinance codified in this chapter.
7. "Illicit discharge" means direct or indirect discharge to the storm drain that is not composed entirely of stormwater. The term does not include a discharge in compliance with an NPDES stormwater discharge permit or resulting from firefighting activities exempted.
8. "Impervious surface" means any material or structure on or above the ground that prevents water from infiltrating the underlying soil. Impervious surface includes without limitation roads, paved parking lots, sidewalks, and rooftops.
9. "Municipal storm drain system (storm drain)" or "municipal separate storm sewer system (MS4)" means 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, ditch, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the city of Revere.
10. "National pollutant discharge elimination system (NPDES) stormwater discharge permit" means a permit issued by the United States Environmental Protection Agency or jointly with the state of Massachusetts that authorizes the discharge of pollutants to waters of the United States or commonwealth.
11. "Non-stormwater discharge" means discharge to the storm drain not comprised entirely of stormwater.
12. "Person" means 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.
13. "Pollutant" means 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 nonpoint 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:

a. Paints, varnishes, solvents;
b. Oil, grease, antifreeze, other automotive fluids and/or products;
c. Nonhazardous liquid and solid wastes;
d. Refuse, garbage, litter, rubbish, yard wastes, or other discarded or abandoned objects, ordnances, accumulations and floatables;
e. Pesticides, herbicides, and fertilizers;
f. Hazardous materials and wastes;
g. Sewage;
h. Dissolved and particulate metals;
i. Metal objects or materials;
j. Animal wastes;
k. Rock, sand, salt, soils, or other products/materials that mobilize in surface water runoff; and
l. Construction wastes and/or residues.

14. "Process wastewater" means water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any material, intermediate product, finished product, or waste product.
15. "Recharge" means the process by which groundwater is replenished by precipitation through the percolation of runoff and surface water through the soil.
16. "Stormwater" means runoff from precipitation or snowmelt.
17. "Toxic or hazardous material or waste" means any material, which because of its quantity, concentration, chemical, corrosive, flammable, reactive, toxic, infectious or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare or to the environment. Toxic or hazardous material includes without limitation:
    a. Any synthetic organic chemical;
    b. Petroleum products;
    c. Heavy metals;
    d. Radioactive or infectious waste;
    e. Acid and alkali substances;
    f. Any substance defined as toxic or hazardous under G.L. Ch. 21C and Ch. 21E, and the regulations at 310 CMR 30.000 and 310 CMR 40.000; and
    g. Any substance listed as hazardous under 40 CFR 261.
18.

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

19. "Waters of the commonwealth" means all waters within the jurisdiction of the commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, coastal waters, and groundwater.
20. "Wastewater" means any sanitary waste, sludge, or septic tank or cesspool overflow, and water that during manufacturing, cleaning or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct or waste product.

C. Applicability. This section shall apply to flows entering the municipally owned and/or operated storm drainage system.

D. Authority. Chapter 13.10 is adopted under the authority granted by the home rule amendment of the Massachusetts Constitution, the home rule statutes, and the regulations of the Federal Clean Water Act found at 40 CFR 122.34.

E. Responsibility for Administration. The DPW and director of municipal inspections shall administer, implement and enforce Chapter 13.10. Any powers granted to or duties imposed upon the DPW to promulgate such rules and regulations shall not have the effect of suspending or invalidating this chapter.

F. Regulations. The DPW may promulgate rules and regulations to effectuate the purpose of this chapter. Failure by the DPW to promulgate such rules and regulations shall not have the effect of suspending or invalidating this chapter.

G. Prohibited Activities.

1. Illicit Discharges. No person shall dump, discharge, cause or allow to be discharged any pollutant or non-stormwater discharge into the storm drain system, into a watercourse, or into waters of the United States and/or commonwealth.
2. Illicit Connections. 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.
3. Obstruction of the Municipal Storm Drain System. No person shall obstruct or interfere with the normal flow of stormwater into or out of the municipal storm drain system without prior approval from the DPW.
4. Exemptions.
    a. Discharge or flow resulting from firefighting activities and DPW ice and snow control operations;
    b.

The following non-stormwater discharges or flows are considered exempt provided that the source is not a significant contributor of pollution to the municipal storm drain system:

i. Waterline flushing,

ii. Flow from potable water sources,

iii. Springs,

iv. Natural flow from riparian habitats and wetlands,

v. Diverted stream flow,

vi. Rising groundwater,

vii. Uncontaminated groundwater infiltrating as defined in 40 CFR 35.2005(20), or uncontaminated pumped groundwater,

viii. Water from exterior foundation drains, footing drains (not including active groundwater dewatering systems), crawl space pumps, or air conditioning condensation,

ix. Discharge from landscape irrigation or lawn watering,

x. Water from individual residential car washing,

xi. Discharge from dechlorinated swimming pool water (less than one ppm chlorine) provided the water is allowed to stand for one week prior to draining and the pool is drained in such a way as not to cause a nuisance,

xii. Discharge from street sweeping,

xiii. Dye testing, provided verbal notification is given to the DPW prior to the time of the test,

xiv. Non-stormwater discharge permitted under an NPDES permit, waiver, or waste discharge order administered under the authority of the United States Environmental Protection Agency, provided that the discharge is in full compliance with the requirements of the permit, waiver, or order and applicable laws and regulations, and

xv. Discharge for which advanced written approval is received from the DPW as necessary to protect public health, safety, welfare, and the environment.

H. Emergency Suspension of Storm Drainage System Access. The DPW may suspend municipal storm drain system access to any person or property without prior written notice when such suspension is necessary to stop an actual or threatened discharge of pollutants that presents imminent risk of harm to public health, safety, welfare or the environment. In the event any person fails to comply with an emergency suspension order, the authorized enforcement agency may take all reasonable steps to prevent or minimize harm to the public, health, safety, welfare, or the environment.

I.

Notification of Spills. Any spills or releases that require notification under local, state or federal law will be the responsibility of the person responsible for a facility or operation, or for an emergency response for a facility or operation (i.e., construction). In the event of a spill or release which may result in a discharge of pollutants or non-stormwater discharge to the municipal storm drain system, waters of the United States, and/or waters of the commonwealth, the responsible parties, potentially responsible parties, or any person or persons managing a site or facility shall take all necessary steps to ensure containment, and remediate any municipal storm drains that have been impacted. However, if in the opinion of the DPW, there is an excessive amount of pollutants in the stormdrain system, the DPW can require remediation by the responsible party regardless of other state or federal regulations. If the discharge of prohibited materials is from a commercial or industrial facility, the facility owner or operator of the facility shall take all necessary steps to ensure containment, cleanup of the release, retain on-site a written record of the discharge, and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

J. Enforcement.

1. The DPW, the department of municipal inspections or an authorized agent of the city shall enforce this chapter, regulations, orders, violation notices, and enforcement orders, and may pursue all civil and criminal remedies for such violations.
    a. Civil Relief. If a person violates the provisions of this by-law, regulations, permit, notice, or order issued thereunder, the DPW or the department of municipal inspections may seek injunctive relief in a court of competent jurisdiction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.
    b. Orders. The DPW, the department of municipal inspections or an authorized agent of the city may issue a written order to enforce the provisions of this chapter or the regulations thereunder, which may include:
        i. Elimination of illicit connections or discharges to the MS4;
        ii. Performance of monitoring, analyses, and reporting;
        iii. That unlawful discharges, practices, or operations shall cease and desist; and
        iv. Remediation of contamination in connection.
2. If the enforcing person determines that abatement or remediation of contaminations is required and is the responsibility of the property owner, the order shall set forth a deadline by which such abatement or remediation must be completed. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the city of Revere may, at its option, undertake such work, and expenses times three thereof shall be charged to the violator.
3.

Within thirty days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner will be notified of the costs incurred by the city of Revere, including administrative costs. The violator or property owner may file a written protest objecting to the amount or basis of costs with the DPW within thirty days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within thirty days following a decision of the DPW affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the costs shall become a special assessment against the property owner and shall constitute a lien on the owners property for the amount of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in G.L. Ch. 59, Section 57 after the thirty-first day at which the costs first become due.

a. Penalty. Any person who violates any provision of this chapter, regulation, order or permit issued thereunder, shall be subject to the penalties set forth in Chapters 1.12 and 1.16 of the revised ordinances of the city of Revere.

b. Entry to Perform Duties Under this Chapter. To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the DPW, the department of municipal inspections, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under this chapter and may make or cause to be made such examinations, surveys or sampling as deemed reasonably necessary.

c. Appeals. The decision or orders of the city shall be final. Further relief shall be to a court of competent jurisdiction.

d. Remedies not Exclusive. The remedies listed in this chapter are not exclusive of any other remedies available under any applicable federal, state or local law.

K. Severability. The provisions of this chapter are declared to be severable. If any provision, paragraph, sentence, or clause, of this chapter or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this chapter.

(C.O.04-753 § A (part))

13.10.020 - Erosion and sediment control.

A. Purpose.

1. The purpose of this section is to eliminate or reduce the adverse effects of soil erosion and sedimentation on the environment, public welfare/health, and municipal facilities.

2. These adverse effects may be the result of managed construction and other activities including but not limited to earth alteration, excavation, removal of vegetation and general construction activities.

B. Definitions. For purposes of this section:

"Agriculture" means the normal maintenance or improvement of land in agricultural or aquacultural use as defined by the Massachusetts Wetlands Protection Act and its implementing regulations.

"Clearing" means any activity that removes the vegetative surface cover.

"Drainage way" means any channel that coveys surface runoff throughout the site.

"Erosion control" means a measure that prevents erosion.

"Erosion and sediment control plan" means a set of plans prepared by or under the direction of a licensed professional engineer, certified professional in erosion and sediment control, or other appropriately licensed and experienced professional, indicating the specific measures and sequencing to be used to control sediment and erosion on a development site during and after construction.

"Grading" means excavation or fill of material, including the resulting conditions thereof.

"Owner" means a person with a legal or equitable interest in property.

"Perimeter control" means a barrier that prevents sediment from leaving a site by filtering sediment-laden runoff or diverting it to an on-site sediment trop or basin.

"Phasing" means clearing a parcel of land in distinct phases, with the stabilization of each phase completed before the clearing of the next.

"Sediment control" means measures that prevent eroded sediment from leaving the site or entering off-site drainage structures.

"Site" means a parcel of land or a contiguous combination thereof, where grading work is performed as a single unified operation.

"Stabilization" means the use of practices that prevent exposed soil from eroding.

"Start of construction" means the first land-disturbing activity associated with a development, including but not limited to land preparation such as clearing, grading and filling; installation of streets and walkways; excavation for basements, footings, piers, or foundations; erection of temporary forms; and installation of accessory buildings such as garages.

"Watercourse" means any body of water, including, but not limited to, lakes, ponds, rivers, streams, and bodies of water.

"Waterway" means a channel that directs surface runoff to a watercourse or to the public storm drain.

C. Jurisdiction.

1.

No person shall excavate, cut, grade or perform any land-disturbing activities of significance, without an approved erosion and sediment control plan. Activities of significance are those which meet or exceed the following thresholds:

a. Any change of existing grade of more than two thousand five hundred square feet or twenty-five percent of the lot whichever is smaller;

b. Removal of existing vegetation of more than two thousand five hundred square feet or twenty-five percent of the lot whichever is smaller;

c. Storage of more than one hundred cubic yards of excavate or fill.

2. Activities which are exempt from the requirement of an approved erosion and sediment control plan are as follows:

a. Emergency activities for the protection of life, property, or natural resources;

b. Existing permitted nursery and agricultural operations.

D. Erosion and Sediment Control Plan.

1. Activities which require the change of existing grade or removal of existing vegetation on any parcel of less than twenty thousand square feet or storage of excavate or fill between one hundred and one thousand three hundred cubic yards shall be deemed a project of minor significance and will require that the following information to be included on the erosion and sediment control plan:

a. Name, address and telephone number of owner, civil engineer and person responsible for implementation of the plan;

b. Property lines;

c. Location of all existing and proposed building and impervious surface;

d. Location of all existing and proposed stormwater utilities, including structures, pipes, swales and detention basins;

e. Erosion and sediment control provisions to minimize on-site erosion and prevent off-site sediment transport, including provisions to preserve topsoil and limit disturbance;

f. Design details for both temporary and permanent erosion control structures;

g. The department of public works may require any additional information or data deemed appropriate and/or may impose such conditions thereto as may be deemed necessary to ensure compliance of public health and safety.

2. Activities which require (a) the change of existing grade or removal of exiting vegetation on more than twenty thousand square feet or (b) storage of excavate or fill in excess of one thousand three hundred cubic yards shall be deemed a project of significant impact and will require that the erosion and sediment control plan include all of the information required of projects of minor significance plus the following additional information:

a. An attached vicinity map showing the location of the site in relationship to the surrounding area's watercourses, water bodies and other significant geographic features, and roads and other significant structures;

b. Suitable contours for the existing and proposed topography;

c. A clear and definite delineation of any areas of vegetation or trees. Note all vegetation that is to be removed and all vegetation that is to be saved;

d. A clear and definite delineation of any wetlands, natural or artificial water storage detention areas, and drainage ditches on the site;

e. A sequence of construction of the development site, including stripping and clearing; rough grading; construction of utilities; infrastructure, and buildings; and final grading and landscaping. Sequencing shall identify the expected date on which clearing will begin, the estimated duration of exposure of cleared areas, areas of clearing and establishment of permanent vegetation.

E. Performance Standards. A construction project shall be considered in conformance with this section if soils or other eroded matter has been prevented from being deposited onto adjacent properties, rights-of-ways, public storm drainage system, or wetland or watercourse. The design, testing, installation, and maintenance of erosion and sediment control operations and facilities shall adhere to the standards and specifications contained in the Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas dated March 1997 or the latest edition thereof.

F. Review and Approval. An erosion and sediment control review is triggered by a building permit application or other activity that falls within the jurisdiction described in subsections C and D above. Applicants are referred by the permit-issuing agency to the department of public works and city engineer to conduct the erosion and sediment control review. Activities that fall within the jurisdiction described in subsections C and D above that do not require a permit from any city department are not exempt from this provision. In this situation, the applicant must seek erosion and sediment control review directly from the department of public works.

1. The department of public works will review each erosion and sediment control plan to determine its conformance with the provisions of this section. Within thirty calendar days after receiving an application, the department of public works shall, in writing:

a. Approve the plan as submitted;

b. Approve the plan subject to such reasonable conditions as may be necessary to secure substantially the objectives of this regulation, and issue the permit subject to these conditions; or

c. Disapprove the plan, indicating the reason(s) and procedure for submitting a revised application and/or submission.

2. Failure of the department of public works to act on an original or revised plan within thirty calendar days of receipt shall authorize the applicant to proceed in accordance with the plans as filed unless such time is extended by agreement between the applicant and the department of public works. Pending preparation approval of a revised plan, development activities shall be allowed to proceed in accordance with conditions established by the department of public works.

G. Inspections.

1. The superintendent of public works, or designated agent shall make inspections as hereinafter required and either shall approve that portion of the work completed or shall notify the owner or person responsible for the implementation of the plan wherein the work fails to comply with the erosion and sediment control plan as approved. Plans for grading, stripping, excavating, and filling work bearing the stamp of approval of the department of public works shall be maintained at the site during the progress of the work. To obtain inspections, the permittee shall notify the department of public works at least two working days before the following:

a. Installation of sediment and erosion control measures*;

b. Start of construction;

c. Completion of site clearing;

d. Completion of rough grading;

e. Close of the construction season;

f. Completion of final landscaping.

* Only notification required on minor projects.

2. The person responsible for implementation of the plan shall make regular inspections of all control measures in accordance with the inspection schedule outlined on the approved erosion and sediment control plan(s). The purpose of such inspections will be able to determine the overall effectiveness of the control plan and the need for additional control measures. All inspections shall be documented in written form and submitted to the department of public works at the time interval specified in the approved permit.

3. The superintendent of public works or its designated agent shall enter the property of the applicant as deemed necessary to make regular inspections to ensure the validity of the reports filed as noted above.

H. Enforcement. Suspension of Construction or Site Alteration Activity. In the event that the activity at a site violates the conditions as stated or shown on the approved erosion and sediment control plan in such a manner as to adversely affect the environment, public welfare/health and

municipal facilities, then the superintendent of public works or director of municipal inspections may suspend work until the violations are corrected.

(C.O.04-753 § A (part))

13.10.030 - Post-construction stormwater management.

A. Purpose. The purpose of this section is to establish minimum requirements and controls to protect and safeguard the environment, natural resources, general health, safety, and welfare of the public residing in watersheds within the city's jurisdiction from the adverse impacts of stormwater runoff. Stormwater management controls are typically permanent features of a complete project, and as such require maintenance and management. This section seeks to meet that purpose through the following objectives:
   1. To minimize stormwater runoff from any development;
   2. To minimize nonpoint source pollution caused by stormwater runoff from development;
   3. To provide for groundwater recharge where appropriate; and
   4. To ensure controls are in place to respond to subsections (A)(1) and (2) and are properly operated and maintained.

B. Definitions. For purposes of this section:

"Accelerated erosion" means erosion caused by development activities that exceeds the natural processes by which the surface of the land is worn away by the action of water, wind, or chemical action.

"Applicant" means a property owner or agent of a property owner who has filed a stormwater management plan.

"Building" means any structure, either temporary or permanent, having walls and a roof, designed for the shelter of any person, animal, or property and occupying more than one hundred square feet of area.

"Channel" means a natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water.

"Dedication" means the deliberate appropriation of property by its owner for general public use.

"Detention" means the temporary storage of storm runoff in a stormwater management facility with the goals of controlling peak discharge rates and providing gravity settling of pollutants.

"Detention facility" means a detention basin or alternative structure designed for the purpose of temporary storage of stream flow or surface runoff and gradual release of stored water at controlled rates.

"Developer" means a person who undertakes land disturbance activities.

"Drainage easement" means a legal right granted by a landowner to a grantee allowing the use of private land for stormwater management purposes.

"Erosion and sediment control plan" means a plan that is designed to minimize the accelerated erosion and sediment runoff at a site during construction activities.

"Fee in lieu" means a payment of money in place of meeting all or part of the stormwater performance standards required by this section.

"Hotspot" means an area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.

"Hydrologic soil group (HSG)" means a natural resource conservation service classification system in which soils are categorized into four runoff potential groups. The groups range from A soils, with high permeability and little runoff production, to D soils, which have low permeability rates and produce much more runoff.

"Impervious cover" means those surfaces that cannot effectively infiltrate rainfall (e.g., building rooftops, pavement, sidewalks, driveways, etc.).

"Industrial stormwater permit" means a national pollutant discharge elimination system (NPDES) permit issued to a commercial industry or group of industries which regulates the pollutant levels associated with industrial stormwater discharges or specifies on-site pollution control strategies.

"Infiltration" means the process of percolating stormwater into the subsoil.

"Infiltration facility" means any structure or device designed to infiltrate retained water to the subsurface. These facilities may be above grade or below grade.

"Jurisdictional wetland" means an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophilic vegetation.

"Land disturbance activity" means any activity which changes the volume or peak flow discharge rate of rainfall runoff from the land surface. This may include the grading, digging, cutting, scraping, or excavating of soil, placement of fill materials, paving, construction, substantial removal of vegetation, or any activity which bares soil or rock or involves the diversion or piping of any natural man-made watercourse.

"Landowner" means the legal or beneficial owner of land, including those holding the right to purchase or lease the land, or any other person holding propriety rights in the land.

"Operation and maintenance plan" means a plan setting up the functional, financial and organizational mechanisms for the ongoing operation and maintenance of a stormwater management system to insure that it continues to function as designed.

"Nonpoint source pollution" means pollution from any source other than from any discernible, confined, and discrete conveyances, and shall include, but not be limited to, pollutants from agricultural, mining, construction, subsurface disposal and urban runoff sources.

"On-site facility" means a stormwater management measure located within the subject property boundary described in the permit application for land development activity.

"Person" means any individual, group of individuals, association, partnership, corporation, company, business organization, trust, estate, the commonwealth of Massachusetts or other political subdivision thereof to the extent subject to city ordinances, administrative agency, public or quasi-public corporation or body, the city of Revere and any other legal entity, its legal representatives, agents or assigns.

"Resource area" means any area protected under the Massachusetts Wetlands Protection Act or Massachusetts Rivers Act.

"Recharge" means the replenishment of underground water reserves.

"Redevelopment" means any construction, alteration, or improvement exceeding one acre in area where existing land use is high-density commercial, industrial, institutional or multifamily residential.

"Stop work order" means an order issued which requires that all construction activity on a site be stopped.

"Stormwater management" means the use of structural or nonstructural practices that are designed to reduce stormwater runoff pollutant loads, discharge volumes, peak flow discharge rates, and detrimental changes in stream temperature that affect water quality and habitat.

"Stormwater retrofit" means a stormwater management practice designed for the existing development site that previously had either no stormwater management practice in a place or a practice inadequate to meet the stormwater management requirements of the site.

"Stormwater runoff" means flow on the surface of the ground, resulting from precipitation.

"Stormwater treatment practices (STPs)" means measures, either structural or nonstructural, that are determined to be the most effective, practical means of preventing or reducing point source or nonpoint source pollution inputs to stormwater runoff and water bodies.

"Water quality volume (WQ)" means the storage needed to capture and treat ninety percent of the average annual stormwater runoff volume; numerically (WQ) will vary as a function of long-term rainfall statistical data.

"Watercourse" means a permanent or intermittent stream or other body of water, either natural or man-made, which gathers or carries surface water.

C. Jurisdiction.

1. No person shall conduct land disturbance activities which would exceed the following thresholds without an approved stormwater management plan:

a.

Any land disturbance activity greater than two thousand five hundred square feet which would result in an increased amount of stormwater runoff from the property to public/private property or resource areas;

b. Any activity which would increase the flow to the municipal storm or sanitary sewer systems;

c. Any activity which would alter or modify an existing drainage system.

2. Activities which are exempt from the requirements of an approved stormwater management plan are:

a. Emergency repairs to any stormwater structure;

b. Maintenance of existing gardens or lawns;

c. Construction of utilities, other than drainage, which would not alter the terrain, ground cover or drainage patterns.

D. Stormwater Management Plan. A stormwater management plan, which meets the design requirements of this chapter, shall be prepared by a licensed professional engineer and submitted to the city engineer and department of public works. The plan shall include, but not be limited to, the items listed below and, at a minimum, be designed to provide sufficient information to evaluate the environmental characteristics of the affected areas, the potential impacts of the proposed development on water resources, and the effectiveness and acceptability of measures proposed for managing stormwater runoff. The applicant shall certify on the drawings that all clearing, grading, drainage, construction, and development shall be conducted in strict accordance with the plan. The minimum information, in addition to the name, address and telephone number of the owner, civil engineer and person responsible for implementation of the plan, submitted for support of a stormwater management plan shall be as follows:

1. Locus map;
2. Drainage area map showing drainage area and stormwater flow paths;
3. Location of existing and proposed utilities;
4. Location of all existing and proposed stormwater utilities, including structures, pipes, swales and detention basins;
5. Topographic survey showing existing and proposed contours;
6. Soils investigation, including borings or test pits, for areas where construction of infiltration practices will occur;
7. Description of all watercourses, impoundments, and wetlands on or adjacent to the site or into which stormwater flows;
8. Delineation of one hundred-year floodplains, if applicable;
9.

Groundwater levels at the time of probable high groundwater elevation (November to April) in areas to be used for stormwater retention, detention, or infiltration;

10. Existing and proposed locations, cross sections, and profiles of all brooks, streams, drainage swells and the method of stabilization;
11. Location of existing and proposed easements;
12. Proposed improvements including location of buildings or other structures, impervious surfaces and storm drainage facilities, if applicable;
13. Structural details for all components of the proposed drainage systems and stormwater management facilities;
14. Timing schedules and sequences of development including clearing, stripping, rough grading, construction, final grading, and vegetative stabilization;
15. Operation and maintenance schedule;
16. Notes on drawings specifying materials to be used, construction specifications, and typicals;
17. Location of areas to be cleared of more than fifty percent of the vegetation.

E. Design Requirements and Performance Standards.

1. Performance Standards. Control of stormwater runoff shall meet the performance standards for both flood control (volume and peak discharge) and nonpoint source pollution reduction as defined in the Massachusetts Stormwater Management Policy dated March 1997 as amended. All assumptions, methodologies and procedures used to design BMPs and stormwater management practices shall accompany the design. All activities, project design, BMPs, and stormwater management practices should aim to minimize stormwater runoff, maximize infiltration and recharge where appropriate, and minimize pollutants in stormwater runoff.
2. Major and Minor Projects. Activities will be classified as major and minor projects. Major projects are defined as projects which have activities resulting in the land disturbance of one acre or more. All other activities will be considered minor projects. Requirements for major and minor projects are as follows:
    a. Major projects must either meet the requirements of the stormwater management standards or demonstrate that an equivalent level of environmental protection is provided in the event that one or more of the standards are not met.
    b. Minor projects must meet the stormwater management standards, however, at the discretion of the DPW, certain aspects of the stormwater management plan may be waived. In general, projects which fall into this category will not require the submission of an operation and maintenance plan.

F. Review and Approval.

1. The department of public works will review the stormwater management plan to determine its conformance with the provisions of this section. For major projects, the conservation commission shall also review the stormwater management plan. Within thirty days after receiving the plan, the department of public works and engineering department shall, in writing:
    a. Approve the plan as submitted;
    b. Approve the plan subject to such reasonable conditions as may be necessary to secure substantially the objectives of this regulation and approve the plan subject to these conditions;
    c. Disapprove the plan indicating the reason(s) and procedure for submitting a revised plan and/or submission.
2. Failure of the department of public works to act on an original or revised application within thirty calendar days of receipt shall authorize the applicant to proceed in accordance with the plan as filed unless such time is extended by agreement between the applicant and the department of public works. Pending preparation and approval of a revised plan, development activities shall be allowed to proceed in accordance with conditions established by the department of public works.

G. Inspections.
1. The superintendent of public works, or designated agent shall make inspections as hereinafter required. To obtain inspections, the applicant shall notify the department of public works at least two working days before the following:
    a. Start of construction;
    b. Installation of stormwater controls;
    c. Close of construction season;
    d. Completion of final grading and landscaping.
2. The applicant shall submit an "as-built" plan for the stormwater controls after the final construction is completed. The plan must show the final design specifications of all stormwater management controls and must be prepared by a professional engineer.

H. Enforcement.
1. When the department of public works or department of municipal inspections determines that an activity is not being carried out in accordance with the requirements of this chapter, a written notice of noncompliance to the applicant shall be issued which, at a minimum, will contain the following:
    a. The name and address of the applicant;
    b.

The street address or description of the building, structure or land upon which the noncompliance is occurring;

c. A statement specifying the nature of the noncompliance;

d. A description of the remedial measures necessary to bring the activity into compliance with this bylaw and a time schedule for the completion.

2. Applicants receiving a notice of noncompliance will be required to halt all construction activities. This "stop work order" will be in effect until the department of public works or department of municipal inspections confirms that the activity involved in the noncompliance has been satisfactorily addressed. Occupancy permits, if applicable, will not be granted until the requirements of this bylaw are complied with.

3. In the event that damages occur to the environment, natural resources, municipal facilities, and/or general health, safety and welfare of the public due to improper installation, operation or maintenance of stormwater controls, a fine may be imposed by the city in accordance with Chapters 1.12 and 1.16 of the revised ordinances of the city of Revere.

(C.O.04-753 § A (part))

Title 13 - PUBLIC SERVICES

Chapters:

Chapter 13.04 - WATER

Sections:

Footnotes:
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***Editor's note—** C.O. 18-133, § 1, adopted May 7, 2018, repealed former Ch. 13.04, §§ 13.04.010—13.04.160, in its entirety and enacted new provisions as herein set out. Former Ch. 13.04 pertained to similar subject matter and derived from prior revision §§ 19-1—19-16; C.O. 83-52, §§ 59, 75; C.O. 82-390(b), § 1; C.O. 86-23, § 11; C.O. 88-310, § 1; C.O. 90-105A, § 1; C.O. 07-525, § 1.*

13.04.010 - Application for service.

All applications for the use of city water shall be made at the office designated by the superintendent of public works, in the form prescribed, stating truly and fully the various uses to which the water is to be applied, and signed by the owner of the premises to be supplied or his or her properly authorized agent. The applicant shall make the required deposit.

(C.O. 18-133, § 1, 5-7-2018)

13.04.020 - Damaging or obstructing fixtures or flow.

No person shall break or in any manner injure any water main, service pipe, stopcock, valve, hydrant, water post, drinking fountain, water main, water meter or other fixture or appurtenance of the water department or obstruct or in any way interfere with the flow of water through the same, nor shall any person in any manner place obstructions which prevent the ready operation of any valve, hydrant, water post, stopcock or other fixture or appurtenance of the water department. Any person who breaks, tampers with, or in any manner alters, damages, destroys, or interferes with any of the foregoing water system components shall be responsible for the full cost of repairing or replacing said components, in addition to being subject to, but not limited to, the penalty provided in Section 1.12, Article III.

(C.O. 18-133, §1 , 5-7-2018)

State Law reference— For the law of the Commonwealth as to injury to reservoirs, etc., see G.L. ch. 266, § 138.

13.04.030 - Damage during excavations.

All damages to service pipes, street mains, hydrants or other fixtures caused by excavations in putting in any sewer, drain or other pipe shall be chargeable to the owner of the premises for whom such work is done.

(C.O. 18-133, § 1, 5-7-2018)

13.04.040 - Responsibility for pipes and meters.

A. All pipes and other fixtures from the water main in the street to the outlet of the meter on the house side of the stopcock shall be furnished and laid by the city at the expense of the owner of the property. The service from the water main to the street line shall be maintained by the city.

B. All water takers shall be liable for such repairs of the fixtures upon the premises owned or occupied by them as shall be deemed necessary by the superintendent of public works to prevent waste of water. Where repair of the water meter is not practical the water taker shall be liable for the installation of a new meter, subject to the provisions of Section 13.04.070.

(C.O. 18-133, § 1, 5-7-2018)

13.04.050 - Shutoff for work on system—Nonliability.

No damages shall be allowed any taker for shutting off water for the purpose of doing ordinary repairs on pipes, gates, hydrants or other fixtures, adding or inserting new ones, changing pipes at any time from one size to another, or lowering and raising pipes in any street.

(C.O. 18-133, § 1, 5-7-2018)

13.04.060 - Shutoff for work on system—Notice.

A reasonable notice shall be given by the city to all takers before their supply of water is cut off for purposes set out in Section 13.04.050, except in cases of great emergency.

(C.O. 18-133, § 1, 5-7-2018)

13.04.070 - Shutoff for nonpayment.

If bills for water, meter or service pipe or materials and labor furnished are not paid within forty days after notice from the city collector that the same are at his or her office, ready for payment, the water may be shut off from the premises which are supplied and shall not be turned on again until all bills are paid, and, in addition thereto, fees for the expense of shutting off and for letting on the water. This rule shall apply to all premises supplied with water, whether they are occupied at the time of such shutting off by the persons who owned or occupied the premises at the time the bills accrued or by other persons.

(C.O. 18-133, § 1, 5-7-2018)

Cross reference— As to city fees, see Table 1 of this revision.

13.04.080 - Shutoff for violations.

Any person neglecting or refusing to comply with the provisions of this chapter may have his or her supply of water cut off, in addition to being subject to the penalty provided in Section 1.12, Article III.

(C.O. 18-133, § 1, 5-7-2018)

13.04.090 - Unlawful connections and turning on or off.

No person shall turn on or off the water in any water main, service pipe, hydrant, water post, drinking fountain or other fixture or appurtenance of the water department, or make any opening into or connection therewith, without authority from the water department; except, that hydrants may be used by firemen in the discharge of their duties.

(C.O. 18-133, § 1, 5-7-2018)

13.04.100 - Right of entry for inspection or repair.

Consistent with M.G.L. ch. 165, § 11D, the superintendent of public works, or any employee authorized by him or her, shall have access at all times to all premises where water is used, for the inspection or repair of the fixtures, setting, testing, or repairing or replacing meters, and shutting off the water from any delinquent taker by closing any faucet or cutting any pipe necessary to effect the object desired. Any person who denies an authorized city employee access to a water line, fixture, or water meter will be subject to, but not limited to, the penalty provided in Section 1.12, Article III.

(C.O. 18-133, § 1, 5-7-2018)

13.04.110 - Services requested by water takers.

Water takers shall be charged for shutting off and for letting on water at the street mains when required by them. Water takers shall be charged for all services rendered upon their premises for thawing frozen pipes, repairing the same in any manner or removing obstructions therefrom. Twenty-four hours' notice shall be given to the water department before letting on or shutting off the water.

(C.O. 18-133, § 1, 5-7-2018)

Cross reference— As to fees for the city, see Table 1 of this revision.

13.04.120 - Use for extinguishing fires.

No charge shall be made for water used from hydrants for extinguishing fires.

(C.O. 18-133, § 1, 5-7-2018)

13.04.121 - Water usage restrictions.

The superintendent of public works shall have the authority in the case of an emergency affecting the water system, including but not limited to water contamination, pressure, flow or volume to declare a water usage emergency restricting the usage of water within the city and when necessary shutting off the supply of water. A reasonable notice shall be given by the city via the media of the declaration of emergency requiring the regulation of shut off of water usage and the dates and times that the regulations shall be in effect.

(C.O. 18-133, § 1, 5-7-2018)

13.04.130 - Meters—Metered rates.

On all premises where water meters have been set, the owner of the premises shall pay the rates according to the schedule established by the city council for not more than the entire amount of water used upon such estates, irrespective of leases or individual consumers. The schedule established by the city council shall include different rates for residential and commercial use, defined as follows:

"Residential use" is use in residential buildings which have one, two or three residential units. This definition is also intended to include all separately-metered condominium, cooperative, or townhouse units.

"Commercial use" is use by non-residential business enterprises, use in residential buildings that have more than three units, and any other use that is not "residential use."

(C.O. 18-133, § 1, 5-7-2018)

13.04.131 - Separate water meters.

Commencing on January 1, 2008, for any new construction of a building or structure with ten or less condominium, cooperative or townhouse units, each unit shall have a separate water meter to measure the water usage within the individual unit. All separately-metered residential condominium, cooperative, or townhouse units shall be charged the residential rate for water and sewer usage in accordance with the schedule established by the city council.

(C.O. 18-133, § 1, 5-7-2018)

13.04.132 - Multi-unit facility billing.

All residential buildings and structures that have more than three units shall be charged the commercial rate for water and sewer usage in accordance with the schedule established by the city council. Should an owner of such a building or structure wish to establish submeters to allow the owner to bill his or her tenants separately, the owner may do so in accordance with the provisions of MGL ch. 186, § 22.

(C.O. 18-133, § 1, 5-7-2018)

13.04.140 - Meters—Removal and repair.

No person, except an agent authorized by the superintendent of public works, shall at any time remove or repair any meter or fixture connected therewith which has been set or used by the water department.

(C.O. 18-133, § 1, 5-7-2018)

13.04.145 - Meters—Accessibility and location.

All water meters shall be located indoors, protected from the elements or other outside intrusions, and shall be readily accessible. The owner is responsible for ensuring that the meter is located in a safe indoor location, accessible and free from obstructions or obstacles, and is not hindered, attached or encased in any manner that would make it difficult or impossible to access, repair, remove, or replace. Any person who fails to comply with this Section will be subject to, but not limited to, the penalty provided in Section 1.12, Article III.

(C.O. 18-133, § 1, 5-7-2018)

13.04.150 - Meters—History.

The superintendent of public works shall keep a history of each water meter showing the make, style, size, number, date purchased, location, date when set, reading at such date and record of tests, and the location, reading and date when reset, and also a description of all repairs.

(C.O. 18-133, § 1, 5-7-2018)

13.04.160 - Prevention of waste.

It is the duty of the superintendent of public works at all times to be diligent to prevent waste of city water and to make such examinations, investigations and tests as to such waste, arising from all causes, as are conducive to the most economical use of water, and no persons shall permit or allow any waste of water.

(C.O. 18-133, § 1, 5-7-2018)

13.04.170 - Fire service meters.

A. Where a fire service line exists on private property or inside a privately-owned building, no connections to that line may be made by any entity for any purpose other than fire protection, and no water from the fire service line may be used for any purpose other than fire protection. Any hose or piping connected to a dedicated fire service line for other types of water use must be disconnected promptly under the supervision of the superintendent of public works and the plumbing inspector.

B. All new building construction that includes a dedicated fire service line shall include a meter on that line. The meter and its automatic meter reading equipment shall be consistent with city water metering standards, and must be approved by the superintendent of public works.

C. By or before March 31, 2017, all existing fire service lines shall have been retrofitted with a water meter. The meter and its automatic meter reading equipment shall be consistent with city water metering standards, and must be approved by the superintendent of public works and the plumbing inspector. Any person or entity that fails to comply with this section shall be subject to, but not limited to, the enforcement and penalty provided in Section 1.12, Article III.

A double check detector assembly will be allowed for the purpose of compliance with this paragraph. This includes the double checks, two gate valves, and meter, but not installation. The property owner is responsible for all costs associated with the purchase and installation of a double check detector assembly.

(C.O. 18-133, § 1, 5-7-2018)

13.04.180 - Water taken from city hydrants for construction or other purposes.

A. No person may utilize a city hydrant to obtain water for construction or any other purposes without the approval of the superintendent of public works.

B. Use of a city hydrant to obtain water for construction purposes shall only be allowed with a temporary meter and backflow device. The temporary meter and backflow device must be obtained from the superintendent of public works after paying the required deposit; see Table 1, Fee Schedule, Water shut-off and turn-on.

(C.O. 18-133, § 1, 5-7-2018)

Chapter 13.05 - CROSS-CONTROL AND BACKFLOW PREVENTION

Sections:

13.05.010 - Purpose.

The purpose of this regulation is as follows:

A. To protect the public potable water supply of the city of Revere from the possibility of contamination or pollution by isolating within the customer's internal distribution system(s) or the customer's private water system(s) such contaminants or pollutants which could flow into the public potable water supply; and

B. To promote the elimination or control of existing cross connections between the customer's in-plant potable water system(s) and nonpotable water system(s), plumbing fixtures and industrial piping systems; and

C. To provide for the maintenance of a continuing cross connection control program which will systematically and effectively prevent contamination or pollution of all potable water systems.

(C.O.07-23 § 1 (part))

13.05.020 - Responsibility of the city.

The city of Revere plumbing department (hereinafter called the "city") shall be responsible for the protection of the public drinking water supply from contamination or pollution due to the backflow of contaminants or pollutants through the water service connection. If, in the judgment of the city, an approved backflow prevention assembly is required at the customer's private water system, for the safety of Revere's public water supply, the city shall give notice in writing to said customer to install an approved backflow prevention device(s) at specific location(s) on the customer's premises. The customer shall immediately install such approved devices, at the customer's expense. The failure, refusal or inability on the part of the customer to install, have tested and maintain said devices shall constitute grounds for the disconnection of water service to the premises until such requirements have been satisfactorily met.

(C.O.07-23 § 1 (part))

13.05.030 - General definitions.

As used in this section, unless the context indicates otherwise, the following words shall have the following meanings:

"Air gap separation" means the method of preventing backflow through the use of an unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture or other device and the flood level of the receptacle.

"Approved backflow prevention device" or "device" means a method to prevent backflow approved by the Massachusetts Department of Environmental Protection for use in Massachusetts.

"Atmospheric vacuum breaker" means an approved backflow device used to prevent back siphonage which is not designed for use under static pressure.

"Backflow" means the flow of water or other liquids, mixtures or substances into the distribution pipes of a potable water supply from any source other than the intended source.

"Backflow preventer with intermediate atmospheric vent" means a device having two independently operating check valves separated by an intermediate chamber with a means for automatically venting it to the atmosphere in which the check valves are force-loaded to a normally closed position and the venting means is force-loaded to a normally open position.

"Barometric loop" means a loop of pipe rising at least thirty-five feet, at its topmost point, above the highest fixture it supplies.

"Contaminant" means any physical, chemical, biological or radiological substance or matter in water.

"Cross connection" means any connection between a distribution pipe of potable water from a public water system and any waste pipe, soil pipe, sewer, drain or other unapproved source. Without limiting the generality of the foregoing, the term "cross connection" shall also include any bypass arrangements, jumper connections, removal section swivel or changeover connection and other temporary or permanent connection through which backflow can or may occur.

"Double check valve assembly" means a backflow prevention device which incorporates an assembly of check valves, with shutoff values at each end and appurtenances for testing.

"Potable water" means water from any source which has been approved by the department of environmental protection for human consumption.

"Pressure vacuum breaker" means an approved backflow prevention device designed to prevent only back siphonage and which is designed for use under static line pressure.

"Public water supply system" means a system for the provision to the public of piped water for human consumption as defined in 310 CMR 22.02(8).

"Reduced pressurer backflow preventer" means an approved backflow prevention device incorporating (1) two or more check valves; (2) automatically operating differential relief value located between the two checks; (3) two shutoff valves; and (4) necessary appurtenances for testing; and which is designed to operate so that (5) the pressure in the zone between the two check valves is maintained at a value less than the pressure on the public water system side of the device; and (6) at cessation of normal flow, the pressure in the zone between the two check valves is maintained at a value less than the pressure on the public water system side of the device; and (7) in the case of leakage of either check valve, the differential relief valve shall operate to maintain reduced pressure in the zone by discharging to the atmosphere.

(C.O.07-23 § 1 (part))

13.05.040 - Description of water system.

The water system shall be considered as made up of two parts: the utility system and the customer system.

A. The utility system shall consist of source facilities and the distribution system, and shall include all those facilities of the water system under the complete control of the utility, up to the point where the customer's system begins. In this definition, the "source" shall include all components of the facilities utilized in the production, treatment, storage and delivery of water to the distribution system; and the "distribution system" shall include the network of conduits used for the delivery of water from the source to the customer's system.

B. The customer system shall include those parts of the facilities beyond the termination of the utility distribution system which are utilized in conveying utility delivered domestic water to points of use.

(C.O.07-23 § 1 (part))

13.05.050 - Prohibited connections and requirements.

A. No water service connection to any premises shall be installed or maintained by the water purveyor unless the water supply is protected as required by Massachusetts state laws and regulations and this chapter. Service of water to any premises shall be discontinued by the city if a backflow prevention assembly required by this chapter and Massachusetts law is not installed, tested and maintained, or if it found that a backflow prevention assembly has been removed, bypassed or if an unprotected cross connection exists on the premises. Service will not be restored until such conditions or defects are corrected.

B. The customer system should be open for inspection at all reasonable times to authorized representatives of the city to determine whether cross connections or other structural or sanitary hazards, including violations of this chapter, exist. When such a condition becomes known, the city shall deny or immediately discontinue service to the premises by providing for a physical break in the service line until the customer has corrected the condition(s) in conformance with the department of environmental protection regulations and this chapter relating to cross connections.

C. No person shall construct or install or contract with another person for the construction or installation of any air gap separation with tank and pump arrangement, reduced pressure backflow preventer, or double check value assembly required by the department of environmental protection or this chapter unless a design data sheet with plans showing the method of protection of the city public water supply has been approved by the city for the installation of such device.

D.

Prior to the installation of any pressure or atmospheric vacuum breaker, backflow preventer with intermediate atmospheric vent, or barometric loop, the plans and specifications for the plumbing work must receive a permit issued pursuant to 248 CMR 2.04(3) by the plumbing inspector. For these devices, a plumbing permit issued under 248 CMR. 2.04(3) shall constitute installation approval pursuant to these regulations.

E. Any person owning or occupying any premises where a cross connection is present shall apply annually to the city for a permit for each reduced pressure backflow preventer and double check valve assembly installed on the premises. Applicants for the annual permit must be made on the Massachusetts Department of Environmental Protection permit application form on or before January 1st of each year. Applications must be accompanied by the appropriate permit fee and the owner inspection and maintenance report form.

F. The Department of Environmental Protection shall revoke any approval or permit for any installation or change in installation of any backflow prevention device which is found to be in noncompliance with 310 CMR 22.22.

G. It shall be the duty of the customer-user at any premises where backflow prevention devices are installed to have certified inspections performed on reduced pressure backflow devices twice each year by the city, and double check valve assemblies shall have certified inspections performed once each year by the city. In those instances where the city deems the hazard to be great enough, the city may require certified inspections at more frequent intervals. These inspections and tests shall be at the expense of the customer and shall be performed by the city or its agents. These assemblies shall be repaired, overhauled or replaced by the customer, at the customer's expense, whenever such assemblies are found to be defective. Records of such tests, repairs or overhaul shall be kept and made available to the city.

(C.O.07-23 § 1 (part))

13.05.060 - Records and reports.

The city shall maintain the following records and reports: (1) all survey and inspection reports; (2) copies of backflow device tests and re-tests; (3) copies of lists, summaries and annual reports submitted to the Department of Environmental Protection; (4) design data sheets and plumbing plans; and (5) copies of violation report forms.

The water customer shall maintain the following records and reports: (1) copies of violation report forms; (2) copies of all backflow device tests and re-tests; and (3) copies of design data sheets and plumbing plans.

(C.O.07-23 § 1 (part))

13.05.070 - Enforcement.

A. Any person or entity violating this chapter, by maintaining a cross connection without a permit, or maintaining a cross connection without installing the appropriate backflow prevention device required by the Massachusetts Department of Environmental Protection or this chapter, is subject to a fine of up to three hundred dollars per offense. Each day that the owner is in violation shall constitute a separate offense.

B. Any violation of this chapter shall be subject to the administrative penalty provisions of 310 CMR 5.00.

C. In order to ensure the delivery of a fit and pure water supply, the city may issue a written order, pursuant to M.G.L. c.111, Section 160 requiring the supplier of water to cease supplying water to any premises if one or more cross connections are maintained in violation of the requirements of this chapter, or requiring any person to take such actions as are reasonable and necessary to prevent or to eliminate cross connections.

D. The plumbing inspector, the health agent and/or code enforcement officers of the board of health shall have the right to enforce this chapter pursuant to the noncriminal disposition procedures set forth in Chapter 1.12.

(C.O.07-23 § 1 (part))

Chapter 13.08 - SEWERS

Sections:

Footnotes:
*--- (**2**) ---*
***Note—** For the law of the Commonwealth as to sewer assessments generally, see G.L. Ch. 83, § 11 et seq. For the law of the Commonwealth as to establishment of common sewers and regulation thereof, see G.L. Ch. 40 § 21(5), (6). See also G.L. Ch. 83, § 1 et seq. and SP Acts of 1916, Ch. 303. For the law of the Commonwealth as to the Massachusetts Water Resources Authority (MWRA) see Ch. 372, SP Acts of 1984.*

Article I. - General Provisions

13.08.005 - Massachusetts Water Resources Authority and other rules unimpaired.

No provision in this chapter shall contravene nor render ineffective any lawfully established rule or regulation of the Massachusetts Water Resources Authority, or any other state or federal agency having jurisdiction.

(C.O.83-52 § 60 (Art. VII § 2))

13.08.010 - Federal and state requirements.

In the event that federal or state agencies enact or promulgate law or regulations more stringent than this chapter, the federal or state requirements shall take precedence.

(C.O.83-52 § 60 (Art. VII § 3))

Article II. - Definitions

13.08.015 - Applicability.

Unless the context specifically indicates otherwise, the meaning of terms used in this chapter shall be as set out in this article.

(C.O.83-52 § 60 (Art. I (part))

13.08.020 - Act.

"Act" means the Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500, and as the same is amended from time to time.

(C.O.83-52 § 60 (Art. I § 1))

13.08.025 - Biochemical oxygen demand (BOD).

"Biochemical oxygen demand (BOD)" means the quantity of oxygen utilized in five days at twenty degrees Celsius, expressed in milligrams per liter, in biochemical oxidation of wastewater as determined by a procedure described in the Standard Methods.

(C.O.83-52 § 60 (Art. I § 2))

13.08.030 - Building sewer.

"Building sewer" means the sanitary sewer connection beginning ten feet from a building and extending to the public sewer, a private sewer or other place of disposal. Also called "house connection."

(C.O.83-52 § 60 (Art. I § 3))

13.08.035 - Chemical oxygen demand (COD).

"Chemical oxygen demand (COD)" means the quantity of oxygen utilized in chemical oxidation of organic matter with a strong chemical oxidant, expressed in milligrams per liter as determined by a procedure described in the Standard Methods.

(C.O.83-52 § 60 (Art. I § 4))

13.08.040 - City engineer.

"City engineer" means the city engineer of the city or his or her authorized agent, deputy or representative.

(C.O.83-52 § 60 (Art. I § 5))

13.08.045 - Compatible pollutant.

"Compatible pollutant" means a substance that is amenable to removal in substantial amounts by the wastewater treatment plant at the MDC Deer Island facility. Compatible pollutants include, but are not limited to, coliform bacteria, suspended solids and those that exert BOD.

(C.O.83-52 § 60 (Art. I § 7))

13.08.050 - Composite sample.

"Composite sample" means a combination of individual samples of water or wastewater taken at selected intervals (generally hourly) for a specified time period, to minimize the effect of the variability of the individual sample. Individual samples may have equal volume or may be proportioned to the flow at the time of sampling.

(C.O.83-52 § 60 (Art. I § 8))

13.08.055 - Department of public works.

"Department of public works" means the department of public works of the city.

(C.O.83-52 § 60 (Art. I § 9))

13.08.060 - Drainage.

"Drainage" means (A) unpolluted surface water which has been collected by a storm drainage system and discharged into a natural outlet, and (B) unpolluted water flowing in a storm drain, derived from groundwater, surface water or stormwater.

(C.O.83-52 § 60 (Art. I § 10))

13.08.065 - Effluent.

"Effluent" means wastewater or other liquid flowing out of a treatment plant, or industrial treatment system, or part thereof.

(C.O.83-52 § 60 (Art. I § 11))

13.08.070 - Entrails.

"Entrails" means the internal parts of animals such as the bowels, guts and viscera.

(C.O.83-52 § 60 (Art. I § 12))

13.08.075 - Equalization of waste flows.

"Equalization of waste flows" means an averaging of variations in flow and composition of wastewaters from particular sources by an equalizing basin or other means, to provide a flow or reasonably uniform volume and composition prior to discharge into a public sewer.

(C.O.83-52 § 60 (Art. I § 13))

13.08.080 - Excessive.

"Excessive" means more than the limits established in this chapter and/or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System regulations or of such magnitude that, in the judgment of the department of public works or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System may cause damage to any facility, be harmful to the wastewater treatment process or reduce its efficiency, cannot be removed in the wastewater treatment plant to the degree required to meet the Act, creates any hazard in the receiving waters, exceeds the capacity of the Metropolitan Sewerage System, or otherwise endangers life, limb or public property, or constitutes a public nuisance.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. I § 14))

13.08.085 - Floatable oil.

"Floatable oil" means oil, fat or grease in a physical state such that it will separate by gravity from wastewater by treatment in an approved pretreatment facility.

(C.O.83-52 § 60 (Art. I § 15))

13.08.090 - Garage.

"Garage" means any building wherein is kept or stored one or more motor vehicles, including among others a public or private garage, carport, motor vehicle repair shop or paint shop, service station, lubritorium, car wash or any building used for similar purposes.

(C.O.83-52 § 60 (Art. I § 16))

13.08.095 - Garbage.

"Garbage" means wastes from the domestic and commercial preparation, cooking and dispensing of food and from the handling, storage and sale of produce.

(C.O.83-52 § 60 (Art. I § 17))

13.08.100 - Grab sample.

"Grab sample" means a single sample of sewage.

(C.O.83-52 § 60 (Art. I § 18))

13.08.105 - Groundwater.

"Groundwater" means a subsurface water occupying the saturation zone, from which wells and springs are fed.

(C.O.83-52 § 60 (Art. I § 19))

13.08.110 - Health inspector.

"Health inspector" means the health inspector of the city or his or her authorized agent, deputy or representative.

(C.O.83-52 § 60 (Art. I § 20))

13.08.115 - Incompatible pollutant.

"Incompatible pollutant" means a substance that is not amenable to removal in substantial amounts by the wastewater treatment plant at the MDC Deer Island facility. Incompatible pollutants include, but are not limited to, toxic metals and persistent organics.

(C.O.83-52 § 60 (Art. I § 21))

13.08.120 - Industrial user.

"Industrial user" means any user identified in the Standard Classification Manual of the U.S. Office of Management and Budget, as amended and supplemented under the following divisions:

A. Division A, agriculture, forestry and fishing;

B. Division B, mining;

C. Division D, manufacturing;

D.

Division E, transportation, communication, electric, gas and sanitary service;

E. Division I, services.

(C.O.83-52 § 60 (Art. I § 22))

13.08.125 - Industrial wastes.

"Industrial wastes" means any solid, liquid or gaseous wastes resulting from industrial processes.

(C.O.83-52 § 60 (Art. I § 23))

13.08.130 - Infiltration.

"Infiltration" means the water entering a sewerage system, including sewer service connections, from the ground or water body, through such means as, but not limited to, defective pipes, pipe joints, connections or manhole walls.

(C.O.83-52 § 60 (Art. I § 24))

13.08.135 - Inflow.

"Inflow" means the water discharged into a sewerage system, including sewer service connections, from such sources as, but not limited to, roof leaders, cellar, yard and area drains, foundation drains, cooling water discharges, drains from springs and swampy areas, manhole covers, cross-connections from storm sewers and combined sewers, catchbasins, stormwaters, surface runoff, street washwaters, or drainage.

(C.O.85-52 § 60 (Art. I § 25))

13.08.140 - Manhole.

"Manhole" means a structure built over a sanitary sewer or a storm drain providing access to the sanitary sewer or storm drain by a person.

(C.O.83-52 § 60 (Art. I § 26))

13.08.150 - Massachusetts Water Resources Authority.

"Massachusetts Water Resource Authority (MWRA)" means an independent agency of the commonwealth or its authorized representative created under Chapter 372 of The Acts of 1984. All of the powers and duties relative to water and sewer formerly of the Metropolitan District Commission (MDC), Metropolitan Sewerage District and Metropolitan Sewerage System are under the jurisdiction and authority of the MWRA, as of the passage date of Council Order 86-23. (Added during 11/90 supplement)

13.08.160 - Milligrams per liter (Mg/l).

"Milligrams per liter (Mg/l)" means a unit of the concentration of substances in water or sewage. One milligram per liter is 0.001 gram of the constituent in one thousand milliliters of water and is approximately equal to one part per million (ppm), which unit has been commonly used for reporting concentration in water and wastewater analyses.

(C.O.83-52 § 60 (Art. I § 31))

13.08.165 - Natural outlet.

"Natural outlet" means any watercourse, pond, ditch, lake or other body of unpolluted surface water or groundwater.

(C.O.83-52 § 60 (Art. I § 32))

13.08.170 - Neutralized.

"Neutralized" means the condition of a solution existing after the reaction of an acid with a base when the concentration of hydrogen and hydroxyl ions in the solution are approximately equal.

(C.O.83-52 § 60 (Art. I § 33))

13.08.175 - Ordinance.

"Ordinance" is synonymous with "by-law," as applied to the city.

(C.O.83-52 § 60 (Art. I § 34))

13.08.180 - Outfall sewer.

"Outfall sewer" means a sanitary sewer leading to the ultimate disposal area normally owned, operated and maintained by the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. I § 35))

13.08.185 - Paunch manure.

"Paunch manure" means the waste products of animals found in the belly upon slaughtering.

(C.O.83-52 § 60 (Art. I § 36))

13.08.190 - Person.

"Person" means any individual, firm, company, partnership, association, society, corporation, group or any political subdivision of the commonwealth.

(C.O.83-52 § 60 (Art. I § 37))

13.08.195 - pH.

"pH" means the logarithm of the reciprocal of the hydrogen ion concentration, expressed in moles per liter of solution. Neutral water, for example, has a pH value of 7 and a hydrogen ion concentration of 10^{-7}. The electrometric method of measurement is preferred. The colorimetric method of measurement may be substituted upon approval by the superintendent of public works, subject to concurrence by the MDC.

(C.O.83-52 § 60 (Art. I § 38))

13.08.200 - Pickling waste.

"Pickling waste" means the wastewater from the cleaning of iron, usually containing high amounts of iron and chloride ions in hydrochloric acid.

(C.O.83-52 § 60 (Art. I § 39))

13.08.205 - Plating solution.

"Plating solution" means a solution of the salts of metals used in metal plating and electrotyping.

(C.O.83-52 § 60 (Art. I § 40))

13.08.210 - Pretreatment.

"Pretreatment" means any treatment of sewage to an acceptable condition for discharge to a sanitary sewer.

(C.O.83-52 § 60 (Art. I § 41))

13.08.215 - Private sewer.

"Private sewer" means a sanitary sewer, other than a building sewer, owned and operated and maintained by some person other than the city or the MDC.

(C.O.83-52 § 60 (Art. I § 42))

13.08.220 - Properly shredded garbage.

"Properly shredded garbage" means garbage that has been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than one-half inch or 1.27 centimeters in any dimension.

(C.O.83-52 § 60 (Art. I § 43))

13.08.225 - Public nuisance.

"Public nuisance" means a wrongful act which destroys or deteriorates the property, real or personal, of an indefinite number of persons, or interferes with their lawful use or enjoyment thereof.

(C.O.83-52 § 60 (Art. I § 44))

13.08.230 - Public sewer.

"Public sewer" means a sanitary sewer owned, operated and maintained by the city.

(C.O.83-52 § 60 (Art. I § 45))

13.08.235 - Public sewerage system.

"Public sewerage system" means any device, equipment or sewerage works owned, operated and maintained by the city, used in the transportation, pumping, storage, treatment, recycling and reclamation of sewage and industrial wastes.

(C.O.83-52 § 60 (Art. I § 46))

13.08.240 - Receiving waters.

"Receiving waters" means any watercourse, river, pond, ditch, lake, aquifer, ocean or other body of surface water or groundwater receiving discharge of wastewater or effluent.

(C.O.83-52 § 60 (Art. I § 47))

13.08.245 - Sanitary sewage.

"Sanitary sewage" means liquid and water-carried human and domestic wastes from residences, public buildings, commercial buildings, industrial plants and institutions, exclusive of groundwater, stormwater and surface water and exclusive of industrial wastes.

(C.O.83-52 § 60 (Art. I § 48))

13.08.250 - Sanitary sewer.

"Sanitary sewer" means a pipe or conduit intended to carry only liquid and water-carried wastes from residences, public buildings, commercial buildings, industrial plants and institutions, together with minor quantities of groundwaters, stormwaters and surface waters that are not admitted intentionally.

(C.O.83-52 § 60 (Art. I § 49))

13.08.255 - Septage.

"Septage" means the liquid and solid wastes of sanitary sewage origin that are removed from a cesspool, septic tank or similar receptacle.

(C.O.83-52 § 60 (Art. I § 50))

13.08.260 - Sewage.

"Sewage" means wastewater from residences, public buildings, commercial or industrial establishments, or any combination thereof.

(C.O.83-52 § 60 (Art. I § 51))

13.08.265 - Sewage treatment plant.

"Sewage treatment plant" means an arrangement of devices and structures for treating wastewater, industrial wastes, and sludge. This term is used as a synonym for "waste treatment plant," "wastewater treatment plant" or "water pollution control plant." The sewage treatment plant at Deer Island is under the jurisdiction of the MDC.

(C.O.83-52 § 60 (Art. I § 52))

13.08.270 - Sewer layer; drain layer.

See 12.18.010.

(C.O. 22-057, § 1, 4-11-2022)

Editor's note— C.O. 22-057, § 1, adopted April 11, 2022, amended § 13.08.270 in its entirety to read as herein set out. Former § 13.08.270 pertained to sewer layer and derived from C.O. 83-52, § 60(Att. I, § 53).

13.08.275 - Sewerage works.

"Sewerage works" means a system of piping, with appurtenances, for collecting and conveying sewage from the source to the point of discharge.

(C.O.83-52 § 60 (Art. I § 54))

13.08.280 - Sludge.

"Sludge" means waste containing amounts of solid contaminants removed from water, sanitary sewage, wastewater or industrial wastes by physical, chemical or biological treatment.

(C.O.83-52 § 60 (Art. I § 56))

13.08.285 - Slug.

"Slug" means any discharge of water, sewage, wastewater or industrial waste which, in concentration of any given constituent or in quantity of flow, exceeds, for any period of duration longer than fifteen minutes, more than five times the average twenty-four-hour concentration or flow during normal operation which may adversely affect the sewerage system.

(C.O.83-52 § 60 (Art. I § 57))

13.08.290 - Standard Methods.

"Standard Methods" means the current edition of "Standard Methods for the Examination of Water and Wastewater" as published by the American Public Health Association, American Water Works Association and Water Pollution Control Federation.

(C.O.83-52 § 60 (Art. I § 58))

13.08.295 - Storm drain.

"Storm drain" means a conduit or channel constructed to carry off, by gravity, unpolluted water, including surplus groundwater, stormwater or surface water. It may be an open ditch, lined or unlined, or a buried pipe.

(C.O.83-52 § 60 (Art. I § 59))

13.08.300 - Director of public works.

"Director of public works" refers to the head of the public works department of the city or his or her authorized agent, deputy or representative.

(C.O. 22-057, § 3, 4-11-2022)

Editor's note— C.O. 22-057, § 3, adopted April 11, 2022, amended § 13.08.300 in its entirety to read as herein set out. Former § 13.08.300 pertained to superintendent of public works and derived from C.O. 83-52, § 60(Att. I, § 60).

13.08.305 - Suspended solids.

"Suspended solids" means (1) solids that either float on the surface of, or are in suspension in, water, wastewater or other liquids, and which are largely removable by laboratory filtering procedures described in the Standard Methods; (2) the quantity of material removed from wastewater in a laboratory test, as prescribed in Standard Methods, and referred to as nonfilterable residue.

(C.O.83-52 § 60 (Art. I § 61))

13.08.310 - Toxic wastes.

"Toxic wastes" means wastes containing toxic or poisonous solids, liquids or gases in sufficient quantity, either singly or by interaction with other wastes, to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, create a public nuisance, or create any hazard in the receiving waters of the sewage treatment plants, and those wastes so specified in this chapter and in the Act.

(C.O.83-52 § 60 (Art. I § 62))

13.08.315 - Treatment system.

"Treatment system" means any device, equipment of works used in the pumping, storage, treatment, recycling and reclamation of sewage and industrial wastes. The treatment system may be publicly owned or privately owned.

(C.O.83-52 § 60 (Art. I § 63))

13.08.320 - Trunk sewer.

"Trunk sewer" means a sanitary sewer that receives many tributary branches and serves a large area. A "trunk sewer" may be owned, operated and maintained by the city or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. I § 64))

13.08.325 - Unpolluted waters.

"Unpolluted waters" means waters that require no treatment to meet the standards of water quality for discharge into natural outlets as determined by the Act.

(C.O.83-52 § 60 (Art. I § 65))

13.08.330 - User.

"User" means any municipality, governmental agency, public authority, person or permittee discharging sewage or industrial wastes directly or indirectly into the public sewerage system or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. I § 66))

13.08.335 - Wastes.

"Wastes" means substances in liquid, solid or gaseous form that can be carried in water.

(C.O.83-52 § 60 (Art. I § 67))

13.08.340 - Wastewater.

"Wastewater" means the spent water of a community, a combination of the liquid and water-carried wastes from residences, public buildings, commercial buildings, industrial plants and institutions, together with any groundwater, surface water and stormwater that may be present.

(C.O.83-52 § 60 (Art. I § 68))

13.08.345 - Watercourse.

"Watercourse" means a natural or manmade channel in which a flow of unpolluted water occurs, either continuously or intermittently.

(C.O.83-52 § 60 (Art. I § 69))

13.08.350 - Whoever.

"Whoever" has the same definition as "person."

(C.O.83-52 § 60 (Art. I § 70))

Article III. - Construction and Connections

13.08.355 - Permit required.

No person shall construct any sanitary sewer or building sewer or uncover, make any connection with or any opening into, use, alter or disturb any public sewer or appurtenance thereof without first obtaining a permit from the department of public works. Any person proposing a new connection into a public sewer or any person proposing a substantial change in the volume or character of sanitary sewage that is being discharged into a public sewer shall notify the department of public works prior to making the proposed change or connection. The department of public works may hold the request for a period of forty-five days in order to ascertain if more information regarding the character of the sewer and/or sanitary sewage is deemed advisable by the director of public works and the city engineer.

(C.O.83-52 § 60 (Art. II § 1))

(C.O. 22-057, § 3, 4-11-2022)

13.08.360 - Application for permit.

A. Consistent with section 12.18.020, applications for permits to construct, repair, alter and/or connect a sanitary sewer, building sewer or other private sewer to the public sewers shall be obtained from the department of public works and approved by the city engineer. There shall be two classes of permits: (1) for residential and commercial service, and (2) for service to establishments producing industrial wastes. In either case, the owner or the owner's authorized agent shall make the application on a form furnished by the department of public works. The permit application shall be supplemented by any plant, specifications or other information considered pertinent in the judgment of the director of public works and/or the city engineer.

B. Prior to obtaining a permit to install or repair a sanitary sewer, building sewer, private sewer or to make a connection to a public sewer, the owner or the owner's authorized agent must notify, by certified mail, at least twenty-four hours before performing the work, all public and private utility departments and companies of the applicant's intentions. Written proof of such notification must be made a part of the application submitted to the director of public works.

(C.O.83-52 § 60 (Art. II § 2 (part))

(C.O. 22-057, §§ 4, 5, 4-11-2022)

13.08.365 - Return of permit upon completion of work.

Upon completion of the work by a licensed drain layer, the permit shall be returned to the director of public works and/or the city engineer with the drain layer's endorsement thereon, stating the work the drain layer has done under such permit.

(C.O.83-52 § 60 (Art. II § 2 (part))

(C.O. 22-057, §§ 6, 7, 4-11-2022)

13.08.370 - Permit and inspection fee.

A. A permit and inspection fee shall be paid to the city at the time the application for a permit under this article is filed.

B. In cases where the owner of the sanitary sewer or building sewer is an agency of the city, other governmental agency or public authority, and in cases where construction of the sanitary sewer or building sewers is being performed by an agent of the city, other governmental agency or public authority, the fee for the permit shall be waived.

(C.O.83-52 §§ 60 (Art. II § 3), 75 (part))

Note— As to permit and inspection fees, see Table I of this revision.

13.08.375 - Record of permits.

The department of public works shall keep a complete record of permits granted, giving the name of the street, the number of the estate, if any, the name of the owner, the size, kind (residential, commercial, industrial) and location of building sewers and other sanitary sewers connected to the public sewers, the name of the drain layer making the connection, and such other facts in connection therewith as may be important as matters of record.

(C.O.83-52 § 60 (Art. II § 4))

(C.O. 22-057, § 8, 4-11-2022)

13.08.380 - Display of permit—Time for completion of work.

No work of laying or repairing building sewers or any sanitary sewer and appurtenances shall be commenced unless the permit to do so is issued by the director of public works and/or the city engineer and is at the site of the work, in the hands of the drain layer or his or her employee. All work shall be completed within the time limitations stated in the permit, which shall be established by the director of public works and/or the city engineer at the time the permit is issued. If not so completed, a new permit shall be obtained by the owner to validate continuance of the work.

(C.O.83-52 § 60 (Art. II § 5 (part))

(C.O. 22-057, §§ 9, 10, 4-11-2022)

13.08.385 - Hours of work.

A. All work shall be performed Monday through Friday, excluding legal holidays, between the hours of eight a.m. and five p.m. When authorized by the director of public works and/or the city engineer, emergency repairs may be performed at hours other than those specified in this section.

B. All permits shall be returned to the department of public works as stated in Section 13.08.370 of this chapter.

(C.O.83-52 § 60 (Art. II § 5 (part))

(C.O. 22-057, § 11, 4-11-2022)

13.08.390 - Responsibility for costs.

All costs and expenses incident to the construction and connection of a building sewer or private sewer shall be borne by the owner.

(C.O.83-52 § 60 (Art. II § 6))

13.08.395 - Separate sewers for each building—Rear buildings.

A. A separate and independent building sewer shall be provided for each and every building; except where one building stands at the rear of another building on an interior lot and no public or private sewer is available or no private sewer can be constructed to the rear building through an adjoining alley, courtyard or driveway, the building sewer may, at the discretion of the director of public works and/or the city engineer, be extended to the rear building and the whole considered as one building sewer. A manhole shall be constructed at the junction of the front building sewer and the rear building sewer or where directed by the department of public works.

B. The department of public works will grant a permit for the type of building sewer connection described in subsection A of this section only if the permit application is forwarded with a certified copy of a legal instrument, which has been filed at the county registry of deeds, in the form of an easement, shown on a plan referred to and filed with the legal instrument, whereby perpetual rights are granted to the rear building to use and maintain the whole building sewer, which shall begin at the public sewer.

(C.O.83-52 § 60 (Art. II § 7))

(C.O. 22-057, § 12, 4-11-2022)

13.08.400 - Use of existing sewers.

A. Existing building sewers, public sewers and private sewers may be used in connection with new building construction or in connection with new sanitary sewer construction, in whole or in part, only after they are examined by the director of public works, the city engineer, the health inspector and the developer/owner, and are found to meet all the requirements of this chapter. The developer/owner, when so required, shall provide documentation to the satisfaction of the director of public works, city engineer and health inspector as to the adequacy of the existing sewer and shall enter into a written agreement whereby he or she assumes all liability and holds harmless the city, its agents and employees, for any damages which might result from the use of the existing sewer insofar as the same is determined to be adequate and in compliance with this chapter.

B. Where the existing sewer is found to be inadequate by the director of public works, city engineer and the health inspector, the cost for all required improvements to such sewer shall be borne by the developer/owner and same shall comply with this chapter.

(C.O.83-52 § 60 (Art. II § 8))

(C.O. 22-057, § 13, 4-11-2022)

13.08.405 - Construction methods and materials.

The size, slope, depth, alignment and materials of the construction of a building sewer, private sewer or sanitary sewer, and the methods to be used in excavating, placing of the pipe, jointing, testing, backfilling the trench and patching, shall all conform to the requirements of the director of public works, the city engineer and/or any other applicable rules and regulations of the city.

(C.O.83-52 § 60 (Art. II § 9))

(C.O. 22-057, § 14, 4-11-2022)

13.08.410 - Elevation of building sewer.

The building sewer, wherever possible, shall be brought to the building at an elevation below the basement floor. In all buildings in which any building sewer is too low to permit gravity flow to the public sewer, the sewage carried by such building sewer shall be lifted by an approved means and discharged into the public sewer.

(C.O.83-52 § 60 (Art. II § 10))

13.08.415 - Clearwater drain connections.

No person shall make a connection of roof downspouts, foundation drains, areaway drains, sump pumps or other sources of surface runoff or groundwater to a building sewer or a private sewer directly or indirectly, which in turn is connected directly or indirectly to a public sewer.

(C.O.83-52 § 60 (Art. II § 11))

(C.O. 13-046, § 1, 2-11-2013)

13.08.420 - Connection specifications.

The connection of the building sewer or a private sewer into the public sewer shall conform to the requirements of the director of public works and the city engineer and/or any other applicable rules and regulations of the city. All such connections shall be made gastight and watertight. Any deviation from the prescribed procedures and materials shall be approved by the director of public works and the city engineer before installation. All work shall be performed by a licensed drain layer.

(C.O.83-52 § 60 (Art. II § 12))

(C.O. 22-057, §§ 15, 16, 4-11-2022)

13.08.425 - Notice of pipelaying and connection.

The applicant for the permit or his or her drain layer for the building sewer or the private sewer shall notify the director of public works twenty-four hours in advance of when the work is to be performed. The laying of the building sewer shall be made under the observation of the director of public works or the director's duly authorized representative. No work shall be covered by the drain layer without the authorization of the director of public works or his or her duly authorized representative.

(C.O.83-52 § 60 (Art. II § 13))

(C.O. 22-057, §§ 17, 18, 4-11-2022)

13.08.430 - Excavation safety.

All excavations for building sewers and private sewer construction shall be adequately guarded with barricades and lights so as to protect the public from hazard. Streets, sidewalks, parkways and other public property disturbed in the course of the work shall be restored in a manner consistent with applicable rules and regulations and to the satisfaction of the director of public works.

(C.O.83-52 § 60 (Art. II § 14))

(C.O. 22-057, § 19, 4-11-2022)

13.08.435 - Licensing and bonding of installers.

No person shall construct, repair or alter any building sewer, or make any connection into any public sewer or Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System sewer unless such person is duly licensed by the director of public works and the city engineer as a drain layer. Such person so licensed shall, before performing any work by virtue of such license, execute a satisfactory bond to the city in a sum of not less than ten thousand dollars. The bond is to contain conditions that the drain layer comply with the ordinances of the city, and the terms and conditions of the permit under which, in each case, work is performed, and that the drain layer will indemnify and hold harmless the city from all damages or costs to which the city may be put by reason of injuries resulting from failure to comply with the terms and conditions of the permit.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. II § 15))

(C.O. 22-057, §§ 20, 21, 4-11-2022)

13.08.440 - Allowing use of license by another.

No person duly licensed as a sewer layer shall allow his or her name to be used by any other person, for the purpose of obtaining permits.

(C.O.83-52 § 60 (Art. II § 16))

13.08.445 - Forfeiture of license.

Any drain layer violating the provisions of this chapter shall, in addition to the general penalty provided for the violation of this chapter, forfeit his or her license.

(C.O.83-52 § 60 (Art. II § 17))

(C.O. 22-057, § 22, 4-11-2022)

Article IV. - Use

13.08.450 - Required.

Owners of a building or buildings situated upon any street, easement or way through which a public sewer has been constructed shall construct and maintain building sewers or private sewers through their premises as may be necessary to conduct the sewage from the building or buildings to enter the public sewers. Any person included within the provisions of this section who refuses to make a permit application to the department of public works for the construction of such building sewers or private sewers and

connecting the same to the public sewer, or neglects to make such permit application within the space of fourteen days after written notice from the department of public works to do so, shall pay the penalty provided for in this chapter.

(C.O.83-52 § 60 (Art. III § 1))

13.08.455 - Repair of building and private sewers.

Whenever any building sewer or private sewer becomes clogged, broken, obstructed, out of order or detrimental to the use of a public sewer, or unfit for sewage purposes, the owner, agent, occupant or person having charge of any such building sewer or private sewer shall, when directed by written notice from the department of public works, remove, reconstruct, alter, cleanse or repair the building sewer or private sewer, as the conditions thereof require. In case of neglect or refusal to comply with such notice within five days after the same is given, the department of public works may cause the building sewer or private sewer to be removed, reconstructed, repaired, altered or cleansed, as it may deem expedient, at the expense of the owner, agent, occupant or other person so notified, who shall also be liable to pay the penalty provided for in these rules and regulations.

(C.O.83-52 § 60 (Art. III § 2))

13.08.460 - Discharge of unpolluted waters.

A. No person shall discharge or cause to be discharged any drainage, unpolluted water, groundwater, roof runoff, subsurface drainage including from sump pumps, uncontaminated cooling waters, live steam or unpolluted industrial process waters, directly or indirectly into the public sewer.

B. All owners of buildings where roof water, groundwater or surface water is being disposed of contrary to the provisions of this section shall be notified by the department of public works and/or another appropriate city department to cease the prohibited discharge. The city may take any and all enforcement measures specified in this chapter. The department of public works may also notify the inspector of plumbing, who shall cause the fixtures through which the water is being admitted to be sealed. If for any reason it becomes necessary to break the seal, it shall only be done as authorized by the department of public works. The work shall be done by a licensed plumber who shall notify the department of public works (in writing) of his or her doings. The inspector shall, as soon as possible thereafter, cause the fixtures to be resealed, the expense of sealing to be borne by the owner.

(C.O.83-52 § 60 (Art. III § 3))

(C.O. 13-046, §§ 2, 3, 2-11-2013)

13.08.465 - Proper discharge of unpolluted waters.

A. Drainage and all other unpolluted waters shall be discharged to such watercourses or storm drains that are specifically designated for unpolluted waters. Permission to enter city-maintained watercourses or storm drains must be obtained from the superintendent of public works and health inspector.

B. Industrial cooling water, unpolluted process waters and live steam may be discharged, in conformance with federal and state regulations, upon approval of the superintendent of public works and health inspector, to storm drains, watercourses or natural outlets.

(C.O.83-52 § 60 (Art. III § 4))

(C.O. 13-046, § 4, 2-11-2013)

13.08.470 - Industrial waste permit—Required.

Every user discharging industrial wastes to the public sewerage system or directly into the Metropolitan Sewerage System shall obtain a joint permit from the department of public works and from the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System. Industrial users proposing new discharges shall obtain such permits prior to constructing a building sewer. The department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System may change the conditions of permit from time to time as circumstances, including regulations enacted or promulgated by the state or federal governments or their agencies, may require. The department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System may stipulate special conditions and terms upon which the permit will be issued. No user may increase the daily volume, strength or rate of the user's permitted discharge beyond fifteen percent without first securing an amendment to his or her permit.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 5 (part))

13.08.475 - Industrial waste permit—Application.

Every industrial user shall be required to obtain a permit and shall, within ninety calendar days of the promulgation of the regulations codified in this chapter, complete and file at their own expense a permit application form with the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System. Known industrial users who have not filed a permit application will be notified by the department of public works or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System to apply for a permit. All industrial users are advised to apply for a permit prior to such notification. Permit application

forms may be obtained from the department of public works at the City Hall and shall be filed within thirty calendar days of notification to both the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 5(a))

13.08.480 - Industrial waste permit—Issuance.

The department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System shall evaluate the adequacy of data furnished in the application form. If insufficient data has been furnished, the department of public works and/or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System will notify the industrial user to provide additional data within a specified time. After acceptance of data, and satisfactory completion of any investigations deemed pertinent, the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System will issue the permit. The department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System may stipulate special conditions and terms upon which the permit may be issued.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 5(b))

13.08.485 - Industrial waste permit—Conditions.

Industrial waste permits may contain the following conditions:

A. Limits on rate, time and characteristics of discharge or requirements for flow regulation and equalization;
B. Installation of inspection, flow measurement and sampling facilities, including access to such facilities;
C. Specifications for monitoring programs which may include flow measurement, sampling, chemical and biological tests, recording of data, and reporting schedule;
D. Pretreatment requirements and schedules for implementation, including schedules for reporting progress toward meeting these requirements;
E. Submission of discharge reports;
F. Special service charges or fees;
G. Other conditions as deemed appropriate by the department of public works and/or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System to ensure compliance with this chapter and with applicable requirements of state or federal law.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 5(c))

13.08.490 - Industrial waste permit—Assignment or transfer.

An industrial waste permit shall not be reassigned or transferred.

(C.O.83-52 § 60 (Art. III § 5(d))

13.08.495 - Industrial waste permit—Revocation—Modification.

If an individual user discharges amounts or rates of pollutants in violation of this chapter, the department of public works or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System may revoke the existing permit in accordance with Section 13.08.655. If an industrial user shows that changes in the industrial process have improved the characteristics and/or volume of its discharge, the permit may be modified upon application by the industrial user to the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System.

(C.O.86-23 § 8 (part); 83-52 § 60 (Art. III § 5(e))

13.08.500 - Industrial waste permit—Enforcement of conditions.

The conditions of all permits shall be enforced by the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System in accordance with the provisions of this chapter.

(C.O.86-23 § 8 (part); 83-52 § 60 (Art. III § 5(f))

13.08.505 - Industrial waste permit—Discharge report.

When required by the permit, each industrial permittee shall submit a duly signed discharge report to the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System containing all information requested by the department of public works and/or Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System in a form acceptable to the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System. The department and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System will evaluate the data furnished. If insufficient data has been furnished, additional information shall be furnished as required.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 5(g))

13.08.510 - Industrial waste permit—Use of information.

The department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System may use the information provided in the permit applications, permits and discharge reports as the basis for determining user charges.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 5(h))

13.08.515 - Prohibited wastes—Generally.

No user or person shall discharge or shall cause or allow to be discharged into a public sewer any substances, water or wastes that the department of public works or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System has identified as likely, either singly or by interaction with other substances:

A. To harm either the sewerage system or the wastewater treatment process;
B. To be otherwise incompatible with the treatment process;
C. To cause a violation of federal and state discharge permits issued to the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System;
D. To adversely affect receiving waters;
E. To endanger life, limb or public property; or
F. To constitute a public nuisance.

(C.O.86-23 § 8 (part); 83-52 § 60 (Art. III § 6 (part))

13.08.520 - Prohibited wastes—Specifically.

Specifically prohibited from public sewers are the following:

A. Unpolluted waters: groundwater, stormwater and surface water, roof runoff, tidewater, subsurface drainage, uncontaminated cooling water, and uncontaminated industrial process water;
B. Flammables: gasoline, benzene, naphtha, fuel oil, crude oil, lubricating oils and flammable or explosive liquids, solids or gases, or any other oils or greases of hydrocarbon or petroleum origin;
C. High or low pH: waters or wastes having a pH lower than 5.5 or higher than 9.5, or having any corrosive or injurious properties capable of causing damage or hazard to structures, equipment, sewerage systems and personnel;
D.

Solids or viscous substances: solids or viscous substances in quantities or of such size as to be capable of causing obstruction to the flow in sewers, or other interference with the proper operation of the sewerage systems, such as but not limited to ashes, cinders, straw, hair, rags, feathers, paunch manure, entrails, paper products, sand, mud, metal, glass, wood, plastics, rubber, latex and lime slurries;

E. Liquids having high temperatures: liquids or vapors having a temperature higher than one hundred fifty degrees Fahrenheit or sixty-five degrees Celsius;

F. Viscous materials: waters or wastes containing fats, wax, grease or oils of vegetable or animal origin in excess of one hundred mg/l or containing other substances which may solidify or become viscous at temperatures between thirty-two degrees Fahrenheit or zero degrees Celsius and one hundred fifty degrees Fahrenheit or sixty-five degrees Celsius. Waters or wastes containing such substances, excluding normal household waste, shall exclude all visible floating oils, fats and greases. The use of chemical or physical means (such as temperature variation, emulsifying agents, mechanical mixers) to bypass or release fats, oils and greases into the municipal sewerage system is prohibited. If the discharge concentration for any fats, oils or greases is in excess of one hundred mg/l after treatment, the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System may increase the discharge concentration limit on a case-by-case basis, when the user demonstrates to the department of public works' or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System's satisfaction that the discharge is not contributing to public nuisance conditions;

G. Garbage: garbage that has not been properly shredded;

H. Toxic metals: waters or wastes containing strong acid, steel pickling wastes, concentrated plating solutions, whether neutralized or not, or any amounts of toxic or objectionable metals in excess of the concentrations attainable by acceptable control technology including, but not limited to, the following:

antimony

arsenic

barium

beryllium

boron

cadmium

chromium

copper

iron

lead

manganese

mercury

nickel

selenium

silver

tin

zinc

In general, wastes containing the above metals shall be treated to reduce their concentrations to the minimum levels attainable by chemical precipitation processes or other equally effective methods. In no case, however, shall allowable metal concentrations be higher than those concentrations allowed by applicable state or federal law;

I. Toxic nonmetals: waters or wastes containing amounts of objectionable nonmetals in excess of concentrations attainable by acceptable control technology including, but not limited to:

ammonia

cyanides

herbicides

hexavalents

pesticides

phenols

phosphates

sulfates

sodium chlorate

chlorides

polychlorinated biphenyls (PCB's)

sulfides

In no case, however, shall allowable nonmetal concentrations be higher than those concentrations allowed by applicable state or federal law;

J. Radioactive wastes: radioactive wastes or isotopes of such half-life or concentrations as may exceed limits established by the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System in compliance with state or federal regulations;

K. Materials which exert or cause:

1. Excessive concentrations of inert suspended solids (such as, but not limited to, fuller's earth, lime slurries and lime residues) or of dissolved solids (such as, but not limited to, sodium chloride, sodium sulfate and ferrous iron compounds) or any other sludges or deposited solids resulting from an industrial or pretreatment process,
2. Excessive discoloration or turbidity (such as, but not limited to, dye wastes and vegetable tanning solutions),
3. Excessive biochemical oxygen demand (BOD), chemical oxygen demand (COD) or chlorine requirements,
4. Unusual volume of flow or concentration of wastes constituting "slugs" as defined in this chapter;

L. State and federal requirements: waters or wastes containing substances, as determined by the Metropolitan District Commission Sewerage Division, which are not amenable to treatment only to such degree that the sewage treatment plant effluent cannot meet the requirements of other agencies having jurisdiction over discharge of effluent to the receiving waters;

M. Dilution: the attainment of specific levels for discharge to municipal sewers by dilution in the absence of treatment is prohibited.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 6))

13.08.525 - Temporary permit for prohibited wastes.

Notwithstanding the limitations set forth in Sections 13.08.515 and 13.08.520, a special permit between the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System and the city and the user may be issued whereby a waste of unusual character or strength may be accepted on an interim basis when, in the opinion of the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System and the department of public works, unusual or extraordinary circumstances compel special terms and/or conditions of temporary duration. Such permit or amendment will be issued only when, in the opinion of the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System and the department of public works, it would not cause any interference with or disruption in the treatment works, would not violate the National Pollutant Discharge Elimination System (NPDES) permit or commonwealth water quality standards, and would not force additional controls on other discharges to achieve compliance with effluent limitations.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 7))

13.08.530 - Requiring pretreatment for prohibited wastes.

If any waters or wastes are proposed to be discharged to the public sewers, which waters or wastes contain the substances or possess the characteristics enumerated in Sections 13.08.515 and 13.08.520, and which, in the judgment of the department of public works, may have a deleterious effect upon the sewage works or which otherwise create a hazard to life or constitute a public nuisance, or which do not meet the limits established by state and federal regulations, the department of public works, with the recommendations of the city engineer and health inspector, may:

A. Recommend that no permit be issued;

B. Require pretreatment to an acceptable condition for discharge to the public sewers.

(C.O.83-52 § 60 (Art. III § 8 (part))

13.08.535 - Pretreatment facilities.

A. If the department of public works permits the pretreatment or equalization of wastewater flows, a facility required to pretreat wastewater to a level acceptable to the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System shall be provided and maintained at the user's expense. Prior to construction of the pretreatment facility, the user shall forward to the department of public works, in triplicate, a description together with detailed plans and calculations showing the proposed facility and operating procedures.

B. Any subsequent changes in an approved facility or method of operation shall be reported to the department of public works, and shall be approved by the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System before modification of the facility.

C. Any user to whom federal or state pretreatment standards are applicable shall be in compliance with such standards within the time required by the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System;

D. The superintendent of public works, the city engineer, the health inspector, the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System or the authorized representative thereof, may inspect the pretreatment facility at all reasonable times to ascertain whether this chapter is being met.

E. Such facilities shall be subject to periodic inspection by the superintendent of public works, the city engineer, the health inspector and Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System personnel or the authorized representatives thereof.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 8 (part))

13.08.540 - Grease, oil and sand traps.

Garages and other establishments where gasoline is used or where wastes containing grease in excessive amounts or any flammable wastes, sand or other harmful ingredients can be discharged and are connected with public sewers, directly or indirectly, shall be provided with a suitable trap or separator. The trap or separator shall be located before any connection to other building sewers, private sewer or public sewers. All traps or separators shall be in accordance with all state and local plumbing codes and shall be of a type and capacity approved by the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System and shall be located so as to be readily and easily accessible for cleaning and inspection. Gas traps shall be constructed and maintained at the user's expense.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 9))

13.08.545 - Control manhole.

A. When required by the department of public works or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System, the owner or user of any property served by a building sewer or other private sewer carrying industrial wastes shall install a suitable control or measuring device together with manholes, chambers, meters and other appurtenances in the building sewer or private sewer to facilitate observation, sampling and measurement of the wastes. Such manholes, chambers and meters, when required, shall be located in a safe and accessible place, and shall be constructed by the owner or user in accordance with plans and specifications approved by the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System with provisions made to ensure that the process wastewater at this location is exclusive of sanitary waste contamination. The manholes, chambers and meters shall be installed by the owner at his or her expense, and shall be maintained and kept in good operating condition by the owner so as to be safe and accessible at all times. The records from the meters and measuring devices shall be furnished to the department of public works and/or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System upon request.
B. The superintendent of public works, the city engineer, the health inspector and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System or the authorized representative thereof, may inspect the sampling facility at reasonable times to ascertain whether this chapter is being met.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 10))

13.08.550 - Measurement, test and analysis methods.

All measurements, tests and analyses of the characteristics of water and wastes to which reference is made in this chapter shall be determined in accordance with the latest editions of Standard Methods, and shall be determined at the control manhole or chamber provided, or by use of suitable samples taken at the control manhole or chamber. In the event that no special manhole has been provided, the control point shall be determined by the department of public works with approval from the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System. Sampling shall normally be performed by the user and shall be carried out by customarily accepted methods; all industries discharging directly or indirectly into a public sewer shall perform such monitoring of their discharges as the department of public works or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System may reasonably require, including installation, use and maintenance of monitoring equipment, keeping records and reporting the results of such monitoring to the department of public works. Such records shall be made available, upon request, to the department of public works or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System.

(C.O.86-23 § 8 (part); 83-52 § 60 (Art. III § 11))

13.08.555 - Discharge reports by industrial users.

Each industrial user having a permit shall submit a duly signed semiannual discharge report to the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System. The discharge report shall be in a form approved by the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System and may be required to include, but not be limited to, the process, volume, rates of flow, production quantities, hours of operation, personnel, substances and concentrations in the wastewater discharge, progress toward compliance with pretreatment requirements, and other information related to the generation and characteristics of the wastes. The report may also be required to include the chemical constituents and quantity of liquid or gaseous materials stored on site even though they may not normally be discharged into the public sewers. The department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System will evaluate the data furnished; if insufficient data have been furnished, additional information may be required.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 12))

13.08.560 - Right to make measurements, tests, analyses.

The department of public works or the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System may inspect, take measurements, and test the facilities of any user to ascertain whether state and federal regulations are being met. Persons or occupants of premises where wastewater is generated or discharged shall allow the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System ready access at all reasonable times to all parts of the premises for inspection, measurements or sampling. The department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System shall be deemed to be performing a governmental function for the benefit of the general public and neither the department of public works nor the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System shall be liable for any loss or damage as a result of the performance of such governmental functions. Where a user has security measures in force which would require proper identification and clearance before entry into the premises, the user shall make necessary arrangements with their security guards so that upon presentation of suitable identification the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System will be permitted to enter without delay for the purposes of carrying out their specific responsibilities.

(C.O.86-23 § 8 (part); 83-52 § 60 (Art. III § 13))

13.08.565 - Use of information.

All information and data on a user obtained from reports, questionnaires, permit applications, permits and monitoring programs and from inspections shall be made available, upon request, to other governmental agencies and to the public without restriction unless the user specifically requests and is able to demonstrate, in writing, to the satisfaction of the department of public works, that the release or communication of such information would divulge methods or processes entitled to protection as trade secrets or would violate any applicable provisions of law.

(C.O.83-52 § 60 (Art. III § 14))

13.08.570 - Accidental discharges.

Each user shall provide protection from any discharges, including accidental discharges, in violation of state and federal regulations.

A. Users shall notify the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System immediately upon discharging wastes in violation of the city, Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System, state and/or federal

regulations, in order for countermeasures to be taken by the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System to minimize damage to the sewerage system and its receiving waters.

B. This notification shall be followed within fifteen days of the date of occurrence by a detailed written statement to the department of public works and the Massachusetts Water Resources Authority District, Massachusetts Water Resources Authority Sewerage System describing the causes of the accidental discharge and the measures being taken to prevent future occurrences. Such notification will not relieve users of liability for any expense, loss or damage to the public or to the Metropolitan Sewerage System, or for any fines imposed by the regulating agencies.

C. Users shall inform their employees of the existence of these accidental discharge regulations and at least one copy shall be permanently posted on the user's bulletin board. A notice shall be furnished and permanently posted advising employees whom to call in case of accidental discharges.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. III § 15))

13.08.575 - Damaging or interfering with system.

No unauthorized person shall maliciously, wilfully or negligently break, damage, destroy, uncover, deface or tamper with any structure, appurtenance or equipment which is a part of the public sewerage system or the Metropolitan Sewerage System, inclusive of pretreatment facilities, monitoring and sampling facilities, building sewers and private sewers. Any person violating this section shall be prosecuted to the fullest extent of the law.

(C.O.83-52 § 60 (Art. IV § 1))

Article V. - User Charges

13.08.580 - Established—Applicability.

The superintendent of public works shall establish an annual charge for each and every estate having one or more building sewers discharging into public sewers, and/or the Massachusetts Water Resources Authority Sewerage System.

(C.O.86-23 § 1)

13.08.585 - Designated generally.

The superintendent of public works shall establish the charge for use of public sewers of the city which shall be fixed based upon per hundred cubic feet of metered water consumption of sewer usage as set forth in Section 13.08.595, 13.08.600 and 13.08.605.

(C.O.86-23 § 2)

13.08.590 - Annual rate setting.

For each fiscal year the superintendent of the department of public works shall establish, as a part of the annual budget submitted to the mayor, a just and equitable sewer user charge based on metered water consumption and/or other applicable standards for computation of sewer usage as set forth in Sections 13.08.595, 13.08.600 and 13.08.605. The charge shall take into account all appropriate sewer-related estimated revenues and available surpluses, and shall produce sufficient revenue to equal or exceed the annual appropriations proposed for sewer operations, maintenance and debt service. The superintendent of the department of public works shall establish the annual sewer user charge in conjunction with the department's annual budget.

(C.O.86-23 § 3; C.O. 83-52 § 60 (Art. VIII § 1(b)))

13.08.595 - Water-usage basis.

Where more than one source of water is used on an estate, the sewer user charge shall be based on the total quantity of water supplied to the estate. Quantities of water shall be determined by approved water meters. Water meters two inches and smaller shall be furnished and maintained by the city; installation shall be by the estate. Water meters larger than two inches shall be furnished, installed and maintained by the estate.

(C.O.83-52 § 60 (Art. VIII § 1(c)))

13.08.600 - Water not discharged to sewer.

An abatement of sewer user charges will be considered, upon receipt by the department of public works of proof that portions of water supplied to the estate does not enter the public sewers, private sewers and/or the Massachusetts Water Resources Authority.

(C.O.86-23 § 4; C.O. 83-52 § 60 (Art. VIII § 1(d)))

13.08.605 - Minimum.

The minimum annual sewer user charge under the provisions of this chapter shall be established by the superintendent of the department of public works.

(C.O.86-23 § 5; C.O. 83-52 § 60 (Art. VIII § 1(e)))

13.08.610 - Payment.

The charges established by this chapter shall be due and payable by the owner of record at such time or times, and in such installments, if any, as the superintendent of the department of public works from time to time determines.

(C.O.86-23 § 6; C.O. 83-52 § 60 (Art. VIII § 1(f)))

13.08.615 - Interest—Delinquency.

On all premises, the owner of the premises shall pay sewer rates according to a schedule established by the superintendent of the department of public works for sewer discharge from such estates, irrespective of leases or individual consumers. A five-dollar charge shall be added to all sewer bills which remain unpaid after thirty days of issue. Nonpayment upon such date shall furthermore be deemed to be delinquent, and thereafter such delinquency shall constitute a lien upon the real estate for which such charges apply. The city treasurer/collector is authorized to file sworn statements showing such delinquencies in the office of the recorder of deeds of the county, and the filing of such statements shall be deemed notice of the lien of such charges.

(C.O.86-23 § 7; C.O. 83-52 § 60 (Art. VIII § 1(g)))

Article VI. - Inspectors

13.08.620 - Right of entry and inquiry.

Authorized representatives of the city and/or the MWRA, bearing proper credentials, shall be permitted to enter all properties connected with the public sewers for the purposes of inspection, observation, measurement, sampling and testing, all in accordance with the provisions of this chapter. They may inquire into any processes including metallurgical, chemical, oil refining, ceramic, paper, plating or other industrial activities that contribute wastewaters or wastes to the public sewers, but shall not order or demand information concerning any patented process or trade secret beyond that necessary to determine that kind, source and amount of wastewater discharged from the industrial or commercial plant to the public sewers.

(C.O.83-52 § 60 (Art. V § 1))

(C.O. 13-046, § 5, 2-11-2013)

13.08.625 - Conduct.

While performing the necessary work on private properties referred to in Section 13.08.620, a representative of the Massachusetts Water Resources Authority or the city shall observe all safety rules applicable to the premises established by the owner of the private property. The owner of the private property shall be held harmless for injury or death to representatives of the Massachusetts Water Resources Authority and/or the city, to the extent permissible by law and shall indemnify the owner of the private property against loss or damage to his or her property by a representative of the city and against all claims and demands for personal injury or property damage asserted against the owner and to the extent caused by the city, except as such may be caused by negligence or failure of the owner to maintain safe conditions as required in Section 13.08.545.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. V § 2))

(C.O. 13-046, § 6, 2-11-2013)

13.08.630 - Right of entry to easements.

Any duly authorized representative of the city bearing proper credentials and identification shall be permitted to enter all private properties through which the city holds a duly negotiated easement for the purposes of, but not limited to, inspection, observation, measurement, sampling, repair and maintenance of any portion of the sewage works lying within the easement. All entry and subsequent work, if any, on the easement, shall be done in full accordance with the terms of the duly negotiated easement pertaining to the private property involved.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. V § 3))

(C.O. 13-046, § 7, 2-11-2013)

Article VII. - Violations

13.08.635 - Cease-and-desist order—Compliance schedule.

When the city and/or the Massachusetts Water Resources Authority finds that any person is, or threatens to be, in violation of this chapter or the provisions of a permit issued under this chapter, the following actions may be taken (not exclusive of other remedies):

A. The city and/or the Massachusetts Water Resources Authority may issue an order to cease and desist any violation, or prevent any threatened violation, to any person not complying, or threatening not to comply, with this chapter, and direct such person as follows:
    1. To comply forthwith;

2. To comply in accordance with a time schedule set forth by the department of public works and/or the Massachusetts Water Resources Authority; or
3. To take appropriate remedial preventive action in the event of a threatened violation;

B. The city and/or the Massachusetts Water Resources Authority may require a user to submit a detailed time schedule setting forth specific actions to be taken as the city and/or the Massachusetts Water Resources Authority deem necessary for the user to follow in order to prevent or correct a violation. The city and/or the Massachusetts Water Resources Authority may issue an implementation schedule to the user containing such specific actions and time schedule.

C. Should a recipient of an order under this section fail to undertake the remedial action by the deadline ordered, the city may, at its option, undertake such work, and expenses thereof, including attorney's fees, shall be recoverable by the city in an action of contract in a court of competent jurisdiction, up to the amount of the total penalty that could have been imposed for the violation.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. VI § 1))

(C.O. 13-046, § 12, 2-11-2013)

13.08.640 - Fines and penalties.

Any person who violates this chapter or any permit, notice or order issued hereunder, or any user who knowingly makes any false statement, representation, record, report, plan or other document filed with the department of public works or the Massachusetts Water Resources Authority, or who falsifies, tampers with or knowingly renders inaccurate any monitoring device or method required under this chapter, may be punished by a fine of not more than fifty dollars for each day such violation continues, or may be subject to a civil penalty not to exceed five thousand dollars per day of such violation, each of which may be assessed in action brought on behalf of the city in any court of competent jurisdiction. As an alternative to criminal prosecution for imposition of a fine, the city may elect to utilize the non-criminal disposition procedure set forth in Chapter 1.12. The city officers authorized to utilize the non-criminal disposition procedure to enforce this chapter are employees of the department of public works, the health agent and code enforcement officers, the building inspector, the plumbing inspector, the city engineer, and any other city officers duly authorized by the superintendent of public works.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. VI § 2))

(C.O. 13-046, § 13, 2-11-2013)

13.08.645 - Liability for damages.

Any person violating any of the provisions of this chapter shall become liable to the city or the Massachusetts Water Resources Authority for any expense, loss or damage suffered by the city or the Massachusetts Water Resources Authority by reason of such offense.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. VI § 3))

(C.O. 13-046, § 8, 2-11-2013)

13.08.650 - Penalties by other jurisdictions.

In addition to all other penalties, fines and liabilities imposed by this chapter, violators shall also be subject to all fines, penalties and liabilities imposed by the Massachusetts Water Resources Authority and all other state and federal agencies having jurisdiction.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. VI § 4))

(C.O. 13-046, § 9, 2-11-2013)

13.08.651 - Injunctive relief.

If a person violates the provisions of this chapter of a permit, notice or order issued hereunder, the city may seek injunctive relief in superior court restraining the person from activities which would create further violations or compelling the person to abate or remedy the violation. Such remedy is not exclusive of other remedies that may be pursued by the city or the Massachusetts Water Resources Authority.

(C.O. 13-046, § 10, 2-11-2013)

13.08.655 - Notice and hearing rights.

In the implementation and enforcement of this chapter, the following provisions shall be observed:

A. Whenever the department of public works issues, denies or modifies a permit; issues an order; or assesses charges under Section 13.08.635 or 13.08.645, the department of public works shall inform the person to whom such action is addressed of the person's right to submit, within ten working days, a written request for reconsideration of that action. The request shall set forth in detail the facts supporting it. The department of public works shall attempt to schedule an informal interview with the person submitting the request, to be held within fifteen days of receiving it, and shall rule in writing on the request within ten working days of the completion of the interview. If the department of public works is, after reasonable attempts, unable to schedule an interview with the person submitting the request, or if that person fails to appear for the scheduled interview, the department of public works shall rule on the request within twenty-five days of receiving the request.

B. When the department of public works proposes to revoke a permit, the department of public works shall notify the user in writing of such proposed ruling and of his or her right to submit, within ten days, a written request for reconsideration of that ruling. The request shall set forth in detail the facts supporting it. The department of public works shall schedule in informal conference with the user submitting the request, to be held within fifteen working days of receiving it, and shall rule in writing on the request within ten working days of the completion of the conference. If the department of public works is, after reasonable attempts, unable to schedule a conference with the user, or if the user of user's representative fails to appear for the scheduled conference, the department of public works shall rule on the request within twenty-five days of receiving the request.

C. A ruling by the department of public works under subsection A or B of this section is final. Appeal may be made to a court of competent jurisdiction.

D. Notwithstanding any other provisions of these regulations, upon determination by the department of public works that a discharge or a violation of these regulations appears to present an imminent danger to health, public welfare or the environment or threatens to interfere with the operations of the city's sewer system, the department may, after informal notice to the user or violator, issue an emergency order to immediately suspend the discharge or cease the violation. Any user receiving such an emergency order shall comply. Should the user fail to act, the city may take action to halt or prevent the discharge or violation, including, without limitation, taking steps to disconnect the user or bringing a civil action for injunctive relief.

E. Enforcement and permit revocation actions taken by the Massachusetts Water Resources Authority under this chapter shall be governed by the provisions of 360 CMR 2.00. The Massachusetts Water Resources Authority reserves the right to take direct enforcement action through the courts, pursuant to Section 8A, Chapter 92, General Laws, in any case of violation of this chapter.

(C.O.86-23 § 8 (part); C.O. 83-52 § 60 (Art. VI § 5))

(C.O. 13-046, § 11, 2-11-2013)

Chapter 13.10 - STORMWATER MANAGEMENT

Sections:

A. Purpose.

1.

The purpose of this section is to eliminate non-stormwater discharges to the city of Revere's municipal storm drain system (storm drain). Non-stormwater discharges contain contaminants and supply additional flows to the city of Revere's storm drain system. Non-stormwater discharges are major causes of:

a. Impairment of water quality and flow in oceans, lakes, ponds, streams, rivers, wetlands, and groundwater;

b. Contamination of drinking water supplies;

c. Alteration or destruction of aquatic and wildlife habitat; and

d. Flooding.

2. Regulation of illicit connections and discharges to the storm drain system is necessary for the protection of the city of Revere's natural resources, municipal facilities, general health, safety, welfare, and the environment.

3. The objectives of this section are:

a. To prevent pollutants from entering the storm drain;

b. To prohibit illicit connections and unauthorized discharges to the storm drain;

c. To remove all such illicit connections;

d. To comply with state and federal statutes and regulations relating to stormwater discharges; and

e. To establish the legal authority to ensure compliance with the provisions of this section through inspection, monitoring, and enforcement.

B. Definitions. For purposes of this section:

1. "Authorized enforcement agency" means the department of public works (hereafter DPW) and the department of municipal inspections and their employees or agents designated to enforce this chapter.

2. "Best management practice (BMP)" means an activity, procedure, restraint, or structural improvement that helps reduce the quantity or improve the quality of stormwater runoff.

3. "Clean Water Act" means the Federal Water Pollution Control Act (33 U.S.C. Section 1251 et seq.) and as it is amended from time to time.

4. "Discharge of pollutants" means the addition from any source of any pollutant or combination of pollutants into the storm drain or into waters of the United States or commonwealth from any source.

5. "Groundwater" means water beneath the surface of the ground, except where the water under the ground is the result of a perched water table.

6. "Illicit connection" means a surface or subsurface drain or conveyance, which allows an illicit discharge into the 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 the ordinance codified in this chapter.

7. "Illicit discharge" means direct or indirect discharge to the storm drain that is not composed entirely of stormwater. The term does not include a discharge in compliance with an NPDES stormwater discharge permit or resulting from firefighting activities exempted.
8. "Impervious surface" means any material or structure on or above the ground that prevents water from infiltrating the underlying soil. Impervious surface includes without limitation roads, paved parking lots, sidewalks, and rooftops.
9. "Municipal storm drain system (storm drain)" or "municipal separate storm sewer system (MS4)" means 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, ditch, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the city of Revere.
10. "National pollutant discharge elimination system (NPDES) stormwater discharge permit" means a permit issued by the United States Environmental Protection Agency or jointly with the state of Massachusetts that authorizes the discharge of pollutants to waters of the United States or commonwealth.
11. "Non-stormwater discharge" means discharge to the storm drain not comprised entirely of stormwater.
12. "Person" means 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.
13. "Pollutant" means 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 nonpoint 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:
    a. Paints, varnishes, solvents;
    b. Oil, grease, antifreeze, other automotive fluids and/or products;
    c. Nonhazardous liquid and solid wastes;
    d. Refuse, garbage, litter, rubbish, yard wastes, or other discarded or abandoned objects, ordnances, accumulations and floatables;
    e. Pesticides, herbicides, and fertilizers;
    f. Hazardous materials and wastes;

g. Sewage;

h. Dissolved and particulate metals;

i. Metal objects or materials;

j. Animal wastes;

k. Rock, sand, salt, soils, or other products/materials that mobilize in surface water runoff; and

l. Construction wastes and/or residues.

14. "Process wastewater" means water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any material, intermediate product, finished product, or waste product.

15. "Recharge" means the process by which groundwater is replenished by precipitation through the percolation of runoff and surface water through the soil.

16. "Stormwater" means runoff from precipitation or snowmelt.

17. "Toxic or hazardous material or waste" means any material, which because of its quantity, concentration, chemical, corrosive, flammable, reactive, toxic, infectious or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare or to the environment. Toxic or hazardous material includes without limitation:

a. Any synthetic organic chemical;

b. Petroleum products;

c. Heavy metals;

d. Radioactive or infectious waste;

e. Acid and alkali substances;

f. Any substance defined as toxic or hazardous under G.L. Ch. 21C and Ch. 21E, and the regulations at 310 CMR 30.000 and 310 CMR 40.000; and

g. Any substance listed as hazardous under 40 CFR 261.

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

19. "Waters of the commonwealth" means all waters within the jurisdiction of the commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, coastal waters, and groundwater.

20. "Wastewater" means any sanitary waste, sludge, or septic tank or cesspool overflow, and water that during manufacturing, cleaning or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished

product, byproduct or waste product.

C. Applicability. This section shall apply to flows entering the municipally owned and/or operated storm drainage system.

D. Authority. Chapter 13.10 is adopted under the authority granted by the home rule amendment of the Massachusetts Constitution, the home rule statutes, and the regulations of the Federal Clean Water Act found at 40 CFR 122.34.

E. Responsibility for Administration. The DPW and director of municipal inspections shall administer, implement and enforce Chapter 13.10. Any powers granted to or duties imposed upon the DPW to promulgate such rules and regulations shall not have the effect of suspending or invalidating this chapter.

F. Regulations. The DPW may promulgate rules and regulations to effectuate the purpose of this chapter. Failure by the DPW to promulgate such rules and regulations shall not have the effect of suspending or invalidating this chapter.

G. Prohibited Activities.

1. Illicit Discharges. No person shall dump, discharge, cause or allow to be discharged any pollutant or non-stormwater discharge into the storm drain system, into a watercourse, or into waters of the United States and/or commonwealth.
2. Illicit Connections. 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.
3. Obstruction of the Municipal Storm Drain System. No person shall obstruct or interfere with the normal flow of stormwater into or out of the municipal storm drain system without prior approval from the DPW.
4. Exemptions.
    a. Discharge or flow resulting from firefighting activities and DPW ice and snow control operations;
    b. The following non-stormwater discharges or flows are considered exempt provided that the source is not a significant contributor of pollution to the municipal storm drain system:
        i. Waterline flushing,
        ii. Flow from potable water sources,
        iii. Springs,
        iv. Natural flow from riparian habitats and wetlands,
        v. Diverted stream flow,
        vi. Rising groundwater,

vii. Uncontaminated groundwater infiltrating as defined in 40 CFR 35.2005(20), or uncontaminated pumped groundwater,

viii. Water from exterior foundation drains, footing drains (not including active groundwater dewatering systems), crawl space pumps, or air conditioning condensation,

ix. Discharge from landscape irrigation or lawn watering,

x. Water from individual residential car washing,

xi. Discharge from dechlorinated swimming pool water (less than one ppm chlorine) provided the water is allowed to stand for one week prior to draining and the pool is drained in such a way as not to cause a nuisance,

xii. Discharge from street sweeping,

xiii. Dye testing, provided verbal notification is given to the DPW prior to the time of the test,

xiv. Non-stormwater discharge permitted under an NPDES permit, waiver, or waste discharge order administered under the authority of the United States Environmental Protection Agency, provided that the discharge is in full compliance with the requirements of the permit, waiver, or order and applicable laws and regulations, and

xv. Discharge for which advanced written approval is received from the DPW as necessary to protect public health, safety, welfare, and the environment.

H. Emergency Suspension of Storm Drainage System Access. The DPW may suspend municipal storm drain system access to any person or property without prior written notice when such suspension is necessary to stop an actual or threatened discharge of pollutants that presents imminent risk of harm to public health, safety, welfare or the environment. In the event any person fails to comply with an emergency suspension order, the authorized enforcement agency may take all reasonable steps to prevent or minimize harm to the public, health, safety, welfare, or the environment.

I. Notification of Spills. Any spills or releases that require notification under local, state or federal law will be the responsibility of the person responsible for a facility or operation, or for an emergency response for a facility or operation (i.e., construction). In the event of a spill or release which may result in a discharge of pollutants or non-stormwater discharge to the municipal storm drain system, waters of the United States, and/or waters of the commonwealth, the responsible parties, potentially responsible parties, or any person or persons managing a site or facility shall take all necessary steps to ensure containment, and remediate any municipal storm drains that have been impacted. However, if in the opinion of the DPW, there is an excessive amount of pollutants in the stormdrain system, the DPW can require remediation by the responsible party regardless of other state or federal regulations. If the discharge of prohibited materials is from a

commercial or industrial facility, the facility owner or operator of the facility shall take all necessary steps to ensure containment, cleanup of the release, retain on-site a written record of the discharge, and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

J. Enforcement.

1. The DPW, the department of municipal inspections or an authorized agent of the city shall enforce this chapter, regulations, orders, violation notices, and enforcement orders, and may pursue all civil and criminal remedies for such violations.
    a. Civil Relief. If a person violates the provisions of this by-law, regulations, permit, notice, or order issued thereunder, the DPW or the department of municipal inspections may seek injunctive relief in a court of competent jurisdiction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.
    b. Orders. The DPW, the department of municipal inspections or an authorized agent of the city may issue a written order to enforce the provisions of this chapter or the regulations thereunder, which may include:
        i. Elimination of illicit connections or discharges to the MS4;
        ii. Performance of monitoring, analyses, and reporting;
        iii. That unlawful discharges, practices, or operations shall cease and desist; and
        iv. Remediation of contamination in connection.
2. If the enforcing person determines that abatement or remediation of contaminations is required and is the responsibility of the property owner, the order shall set forth a deadline by which such abatement or remediation must be completed. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the city of Revere may, at its option, undertake such work, and expenses times three thereof shall be charged to the violator.
3. Within thirty days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner will be notified of the costs incurred by the city of Revere, including administrative costs. The violator or property owner may file a written protest objecting to the amount or basis of costs with the DPW within thirty days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within thirty days following a decision of the DPW affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the costs shall become a special assessment against the property owner and shall

constitute a lien on the owners property for the amount of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in G.L. Ch. 59, Section 57 after the thirty-first day at which the costs first become due.

a. Penalty. Any person who violates any provision of this chapter, regulation, order or permit issued thereunder, shall be subject to the penalties set forth in Chapters 1.12 and 1.16 of the revised ordinances of the city of Revere.

b. Entry to Perform Duties Under this Chapter. To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the DPW, the department of municipal inspections, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under this chapter and may make or cause to be made such examinations, surveys or sampling as deemed reasonably necessary.

c. Appeals. The decision or orders of the city shall be final. Further relief shall be to a court of competent jurisdiction.

d. Remedies not Exclusive. The remedies listed in this chapter are not exclusive of any other remedies available under any applicable federal, state or local law.

K. Severability. The provisions of this chapter are declared to be severable. If any provision, paragraph, sentence, or clause, of this chapter or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this chapter.

(C.O.04-753 § A (part))

13.10.020 - Erosion and sediment control.

A. Purpose.

1. The purpose of this section is to eliminate or reduce the adverse effects of soil erosion and sedimentation on the environment, public welfare/health, and municipal facilities.

2. These adverse effects may be the result of managed construction and other activities including but not limited to earth alteration, excavation, removal of vegetation and general construction activities.

B. Definitions. For purposes of this section:

"Agriculture" means the normal maintenance or improvement of land in agricultural or aquacultural use as defined by the Massachusetts Wetlands Protection Act and its implementing regulations.

"Clearing" means any activity that removes the vegetative surface cover.

"Drainage way" means any channel that coveys surface runoff throughout the site.

"Erosion control" means a measure that prevents erosion.

"Erosion and sediment control plan" means a set of plans prepared by or under the direction of a licensed professional engineer, certified professional in erosion and sediment control, or other appropriately licensed and experienced professional, indicating the specific measures and sequencing to be used to control sediment and erosion on a development site during and after construction.

"Grading" means excavation or fill of material, including the resulting conditions thereof.

"Owner" means a person with a legal or equitable interest in property.

"Perimeter control" means a barrier that prevents sediment from leaving a site by filtering sediment-laden runoff or diverting it to an on-site sediment trop or basin.

"Phasing" means clearing a parcel of land in distinct phases, with the stabilization of each phase completed before the clearing of the next.

"Sediment control" means measures that prevent eroded sediment from leaving the site or entering off-site drainage structures.

"Site" means a parcel of land or a contiguous combination thereof, where grading work is performed as a single unified operation.

"Stabilization" means the use of practices that prevent exposed soil from eroding.

"Start of construction" means the first land-disturbing activity associated with a development, including but not limited to land preparation such as clearing, grading and filling; installation of streets and walkways; excavation for basements, footings, piers, or foundations; erection of temporary forms; and installation of accessory buildings such as garages.

"Watercourse" means any body of water, including, but not limited to, lakes, ponds, rivers, streams, and bodies of water.

"Waterway" means a channel that directs surface runoff to a watercourse or to the public storm drain.

C. Jurisdiction.

1. No person shall excavate, cut, grade or perform any land-disturbing activities of significance, without an approved erosion and sediment control plan. Activities of significance are those which meet or exceed the following thresholds:
    a. Any change of existing grade of more than two thousand five hundred square feet or twenty-five percent of the lot whichever is smaller;
    b. Removal of existing vegetation of more than two thousand five hundred square feet or twenty-five percent of the lot whichever is smaller;
    c. Storage of more than one hundred cubic yards of excavate or fill.
2.

Activities which are exempt from the requirement of an approved erosion and sediment control plan are as follows:

a. Emergency activities for the protection of life, property, or natural resources;

b. Existing permitted nursery and agricultural operations.

D. Erosion and Sediment Control Plan.

1. Activities which require the change of existing grade or removal of existing vegetation on any parcel of less than twenty thousand square feet or storage of excavate or fill between one hundred and one thousand three hundred cubic yards shall be deemed a project of minor significance and will require that the following information to be included on the erosion and sediment control plan:

   a. Name, address and telephone number of owner, civil engineer and person responsible for implementation of the plan;

   b. Property lines;

   c. Location of all existing and proposed building and impervious surface;

   d. Location of all existing and proposed stormwater utilities, including structures, pipes, swales and detention basins;

   e. Erosion and sediment control provisions to minimize on-site erosion and prevent off-site sediment transport, including provisions to preserve topsoil and limit disturbance;

   f. Design details for both temporary and permanent erosion control structures;

   g. The department of public works may require any additional information or data deemed appropriate and/or may impose such conditions thereto as may be deemed necessary to ensure compliance of public health and safety.

2. Activities which require (a) the change of existing grade or removal of exiting vegetation on more than twenty thousand square feet or (b) storage of excavate or fill in excess of one thousand three hundred cubic yards shall be deemed a project of significant impact and will require that the erosion and sediment control plan include all of the information required of projects of minor significance plus the following additional information:

   a. An attached vicinity map showing the location of the site in relationship to the surrounding area's watercourses, water bodies and other significant geographic features, and roads and other significant structures;

   b. Suitable contours for the existing and proposed topography;

   c. A clear and definite delineation of any areas of vegetation or trees. Note all vegetation that is to be removed and all vegetation that is to be saved;

   d. A clear and definite delineation of any wetlands, natural or artificial water storage detention areas, and drainage ditches on the site;

e. A sequence of construction of the development site, including stripping and clearing; rough grading; construction of utilities; infrastructure, and buildings; and final grading and landscaping. Sequencing shall identify the expected date on which clearing will begin, the estimated duration of exposure of cleared areas, areas of clearing and establishment of permanent vegetation.

E. Performance Standards. A construction project shall be considered in conformance with this section if soils or other eroded matter has been prevented from being deposited onto adjacent properties, rights-of-ways, public storm drainage system, or wetland or watercourse. The design, testing, installation, and maintenance of erosion and sediment control operations and facilities shall adhere to the standards and specifications contained in the Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas dated March 1997 or the latest edition thereof.

F. Review and Approval. An erosion and sediment control review is triggered by a building permit application or other activity that falls within the jurisdiction described in subsections C and D above. Applicants are referred by the permit-issuing agency to the department of public works and city engineer to conduct the erosion and sediment control review. Activities that fall within the jurisdiction described in subsections C and D above that do not require a permit from any city department are not exempt from this provision. In this situation, the applicant must seek erosion and sediment control review directly from the department of public works.

1. The department of public works will review each erosion and sediment control plan to determine its conformance with the provisions of this section. Within thirty calendar days after receiving an application, the department of public works shall, in writing:
   a. Approve the plan as submitted;
   b. Approve the plan subject to such reasonable conditions as may be necessary to secure substantially the objectives of this regulation, and issue the permit subject to these conditions; or
   c. Disapprove the plan, indicating the reason(s) and procedure for submitting a revised application and/or submission.
2. Failure of the department of public works to act on an original or revised plan within thirty calendar days of receipt shall authorize the applicant to proceed in accordance with the plans as filed unless such time is extended by agreement between the applicant and the department of public works. Pending preparation approval of a revised plan, development activities shall be allowed to proceed in accordance with conditions established by the department of public works.

G. Inspections.

1.

The superintendent of public works, or designated agent shall make inspections as hereinafter required and either shall approve that portion of the work completed or shall notify the owner or person responsible for the implementation of the plan wherein the work fails to comply with the erosion and sediment control plan as approved. Plans for grading, stripping, excavating, and filling work bearing the stamp of approval of the department of public works shall be maintained at the site during the progress of the work. To obtain inspections, the permittee shall notify the department of public works at least two working days before the following:

a. Installation of sediment and erosion control measures*;
b. Start of construction;
c. Completion of site clearing;
d. Completion of rough grading;
e. Close of the construction season;
f. Completion of final landscaping.

* Only notification required on minor projects.

2. The person responsible for implementation of the plan shall make regular inspections of all control measures in accordance with the inspection schedule outlined on the approved erosion and sediment control plan(s). The purpose of such inspections will be able to determine the overall effectiveness of the control plan and the need for additional control measures. All inspections shall be documented in written form and submitted to the department of public works at the time interval specified in the approved permit.
3. The superintendent of public works or its designated agent shall enter the property of the applicant as deemed necessary to make regular inspections to ensure the validity of the reports filed as noted above.

H. Enforcement. Suspension of Construction or Site Alteration Activity. In the event that the activity at a site violates the conditions as stated or shown on the approved erosion and sediment control plan in such a manner as to adversely affect the environment, public welfare/health and municipal facilities, then the superintendent of public works or director of municipal inspections may suspend work until the violations are corrected.

(C.O.04-753 § A (part))

13.10.030 - Post-construction stormwater management.

A. Purpose. The purpose of this section is to establish minimum requirements and controls to protect and safeguard the environment, natural resources, general health, safety, and welfare of the public residing in watersheds within the city's jurisdiction from the adverse impacts of

stormwater runoff. Stormwater management controls are typically permanent features of a complete project, and as such require maintenance and management. This section seeks to meet that purpose through the following objectives:

1. To minimize stormwater runoff from any development;
2. To minimize nonpoint source pollution caused by stormwater runoff from development;
3. To provide for groundwater recharge where appropriate; and
4. To ensure controls are in place to respond to subsections (A)(1) and (2) and are properly operated and maintained.

B. Definitions. For purposes of this section:

"Accelerated erosion" means erosion caused by development activities that exceeds the natural processes by which the surface of the land is worn away by the action of water, wind, or chemical action.

"Applicant" means a property owner or agent of a property owner who has filed a stormwater management plan.

"Building" means any structure, either temporary or permanent, having walls and a roof, designed for the shelter of any person, animal, or property and occupying more than one hundred square feet of area.

"Channel" means a natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water.

"Dedication" means the deliberate appropriation of property by its owner for general public use.

"Detention" means the temporary storage of storm runoff in a stormwater management facility with the goals of controlling peak discharge rates and providing gravity settling of pollutants.

"Detention facility" means a detention basin or alternative structure designed for the purpose of temporary storage of stream flow or surface runoff and gradual release of stored water at controlled rates.

"Developer" means a person who undertakes land disturbance activities.

"Drainage easement" means a legal right granted by a landowner to a grantee allowing the use of private land for stormwater management purposes.

"Erosion and sediment control plan" means a plan that is designed to minimize the accelerated erosion and sediment runoff at a site during construction activities.

"Fee in lieu" means a payment of money in place of meeting all or part of the stormwater performance standards required by this section.

"Hotspot" means an area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.

"Hydrologic soil group (HSG)" means a natural resource conservation service classification system in which soils are categorized into four runoff potential groups. The groups range from A soils, with high permeability and little runoff production, to D soils, which have low permeability rates and produce much more runoff.

"Impervious cover" means those surfaces that cannot effectively infiltrate rainfall (e.g., building rooftops, pavement, sidewalks, driveways, etc.).

"Industrial stormwater permit" means a national pollutant discharge elimination system (NPDES) permit issued to a commercial industry or group of industries which regulates the pollutant levels associated with industrial stormwater discharges or specifies on-site pollution control strategies.

"Infiltration" means the process of percolating stormwater into the subsoil.

"Infiltration facility" means any structure or device designed to infiltrate retained water to the subsurface. These facilities may be above grade or below grade.

"Jurisdictional wetland" means an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophilic vegetation.

"Land disturbance activity" means any activity which changes the volume or peak flow discharge rate of rainfall runoff from the land surface. This may include the grading, digging, cutting, scraping, or excavating of soil, placement of fill materials, paving, construction, substantial removal of vegetation, or any activity which bares soil or rock or involves the diversion or piping of any natural man-made watercourse.

"Landowner" means the legal or beneficial owner of land, including those holding the right to purchase or lease the land, or any other person holding propriety rights in the land.

"Operation and maintenance plan" means a plan setting up the functional, financial and organizational mechanisms for the ongoing operation and maintenance of a stormwater management system to insure that it continues to function as designed.

"Nonpoint source pollution" means pollution from any source other than from any discernible, confined, and discrete conveyances, and shall include, but not be limited to, pollutants from agricultural, mining, construction, subsurface disposal and urban runoff sources.

"On-site facility" means a stormwater management measure located within the subject property boundary described in the permit application for land development activity.

"Person" means any individual, group of individuals, association, partnership, corporation, company, business organization, trust, estate, the commonwealth of Massachusetts or other political subdivision thereof to the extent subject to city ordinances, administrative agency, public or quasi-public corporation or body, the city of Revere and any other legal entity, its legal representatives, agents or assigns.

"Resource area" means any area protected under the Massachusetts Wetlands Protection Act or Massachusetts Rivers Act.

"Recharge" means the replenishment of underground water reserves.

"Redevelopment" means any construction, alteration, or improvement exceeding one acre in area where existing land use is high-density commercial, industrial, institutional or multifamily residential.

"Stop work order" means an order issued which requires that all construction activity on a site be stopped.

"Stormwater management" means the use of structural or nonstructural practices that are designed to reduce stormwater runoff pollutant loads, discharge volumes, peak flow discharge rates, and detrimental changes in stream temperature that affect water quality and habitat.

"Stormwater retrofit" means a stormwater management practice designed for the existing development site that previously had either no stormwater management practice in a place or a practice inadequate to meet the stormwater management requirements of the site.

"Stormwater runoff" means flow on the surface of the ground, resulting from precipitation.

"Stormwater treatment practices (STPs)" means measures, either structural or nonstructural, that are determined to be the most effective, practical means of preventing or reducing point source or nonpoint source pollution inputs to stormwater runoff and water bodies.

"Water quality volume (WQ)" means the storage needed to capture and treat ninety percent of the average annual stormwater runoff volume; numerically (WQ) will vary as a function of long-term rainfall statistical data.

"Watercourse" means a permanent or intermittent stream or other body of water, either natural or man-made, which gathers or carries surface water.

C. Jurisdiction.

1. No person shall conduct land disturbance activities which would exceed the following thresholds without an approved stormwater management plan:
    a. Any land disturbance activity greater than two thousand five hundred square feet which would result in an increased amount of stormwater runoff from the property to public/private property or resource areas;
    b. Any activity which would increase the flow to the municipal storm or sanitary sewer systems;
    c. Any activity which would alter or modify an existing drainage system.
2. Activities which are exempt from the requirements of an approved stormwater management plan are:

a. Emergency repairs to any stormwater structure;

b. Maintenance of existing gardens or lawns;

c. Construction of utilities, other than drainage, which would not alter the terrain, ground cover or drainage patterns.

D. Stormwater Management Plan. A stormwater management plan, which meets the design requirements of this chapter, shall be prepared by a licensed professional engineer and submitted to the city engineer and department of public works. The plan shall include, but not be limited to, the items listed below and, at a minimum, be designed to provide sufficient information to evaluate the environmental characteristics of the affected areas, the potential impacts of the proposed development on water resources, and the effectiveness and acceptability of measures proposed for managing stormwater runoff. The applicant shall certify on the drawings that all clearing, grading, drainage, construction, and development shall be conducted in strict accordance with the plan. The minimum information, in addition to the name, address and telephone number of the owner, civil engineer and person responsible for implementation of the plan, submitted for support of a stormwater management plan shall be as follows:

1. Locus map;
2. Drainage area map showing drainage area and stormwater flow paths;
3. Location of existing and proposed utilities;
4. Location of all existing and proposed stormwater utilities, including structures, pipes, swales and detention basins;
5. Topographic survey showing existing and proposed contours;
6. Soils investigation, including borings or test pits, for areas where construction of infiltration practices will occur;
7. Description of all watercourses, impoundments, and wetlands on or adjacent to the site or into which stormwater flows;
8. Delineation of one hundred-year floodplains, if applicable;
9. Groundwater levels at the time of probable high groundwater elevation (November to April) in areas to be used for stormwater retention, detention, or infiltration;
10. Existing and proposed locations, cross sections, and profiles of all brooks, streams, drainage swells and the method of stabilization;
11. Location of existing and proposed easements;
12. Proposed improvements including location of buildings or other structures, impervious surfaces and storm drainage facilities, if applicable;
13.

Structural details for all components of the proposed drainage systems and stormwater management facilities;

14. Timing schedules and sequences of development including clearing, stripping, rough grading, construction, final grading, and vegetative stabilization;
15. Operation and maintenance schedule;
16. Notes on drawings specifying materials to be used, construction specifications, and typicals;
17. Location of areas to be cleared of more than fifty percent of the vegetation.

E. Design Requirements and Performance Standards.

1. Performance Standards. Control of stormwater runoff shall meet the performance standards for both flood control (volume and peak discharge) and nonpoint source pollution reduction as defined in the Massachusetts Stormwater Management Policy dated March 1997 as amended. All assumptions, methodologies and procedures used to design BMPs and stormwater management practices shall accompany the design. All activities, project design, BMPs, and stormwater management practices should aim to minimize stormwater runoff, maximize infiltration and recharge where appropriate, and minimize pollutants in stormwater runoff.
2. Major and Minor Projects. Activities will be classified as major and minor projects. Major projects are defined as projects which have activities resulting in the land disturbance of one acre or more. All other activities will be considered minor projects. Requirements for major and minor projects are as follows:
   a. Major projects must either meet the requirements of the stormwater management standards or demonstrate that an equivalent level of environmental protection is provided in the event that one or more of the standards are not met.
   b. Minor projects must meet the stormwater management standards, however, at the discretion of the DPW, certain aspects of the stormwater management plan may be waived. In general, projects which fall into this category will not require the submission of an operation and maintenance plan.

F. Review and Approval.

1. The department of public works will review the stormwater management plan to determine its conformance with the provisions of this section. For major projects, the conservation commission shall also review the stormwater management plan. Within thirty days after receiving the plan, the department of public works and engineering department shall, in writing:
   a. Approve the plan as submitted;
   b.

Approve the plan subject to such reasonable conditions as may be necessary to secure substantially the objectives of this regulation and approve the plan subject to these conditions;

c. Disapprove the plan indicating the reason(s) and procedure for submitting a revised plan and/or submission.

2. Failure of the department of public works to act on an original or revised application within thirty calendar days of receipt shall authorize the applicant to proceed in accordance with the plan as filed unless such time is extended by agreement between the applicant and the department of public works. Pending preparation and approval of a revised plan, development activities shall be allowed to proceed in accordance with conditions established by the department of public works.

G. Inspections.

1. The superintendent of public works, or designated agent shall make inspections as hereinafter required. To obtain inspections, the applicant shall notify the department of public works at least two working days before the following:
   a. Start of construction;
   b. Installation of stormwater controls;
   c. Close of construction season;
   d. Completion of final grading and landscaping.
2. The applicant shall submit an "as-built" plan for the stormwater controls after the final construction is completed. The plan must show the final design specifications of all stormwater management controls and must be prepared by a professional engineer.

H. Enforcement.

1. When the department of public works or department of municipal inspections determines that an activity is not being carried out in accordance with the requirements of this chapter, a written notice of noncompliance to the applicant shall be issued which, at a minimum, will contain the following:
   a. The name and address of the applicant;
   b. The street address or description of the building, structure or land upon which the noncompliance is occurring;
   c. A statement specifying the nature of the noncompliance;
   d. A description of the remedial measures necessary to bring the activity into compliance with this bylaw and a time schedule for the completion.
2. Applicants receiving a notice of noncompliance will be required to halt all construction activities. This "stop work order" will be in effect until the department of public works or department of municipal inspections confirms that the activity involved in the noncompliance

has been satisfactorily addressed. Occupancy permits, if applicable, will not be granted until the requirements of this bylaw are complied with.

3. In the event that damages occur to the environment, natural resources, municipal facilities, and/or general health, safety and welfare of the public due to improper installation, operation or maintenance of stormwater controls, a fine may be imposed by the city in accordance with Chapters 1.12 and 1.16 of the revised ordinances of the city of Revere.

(C.O.04-753 § A (part))

APPENDIX I

Inspection Procedures

CONSTRUCTION SITE STORMWATER INSPECTION REPORT

General Information

Project Name			
Project Location			
Site Operator			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Subject to USEPA Construction General Permit? Yes ☐ No ☐ If yes, has NOI been approved? Yes ☐ No ☐ If yes, attach approved NOI to this report. **If no, contact site operator immediately to determine status of NOI.**			
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			
Describe the current phase of construction			

Site-Specific BMPs

Customize the following BMPs to be consistent with the SWPPP for the site being inspected.

	BMP Description	Installed and Operating Properly?	Corrective Action Needed
1		Yes ☐ No ☐	
2		Yes ☐ No ☐	

(continued)

	BMP Description	Installed and Operating Properly?	Corrective Action Needed
3		Yes ☐ No ☐	
4		Yes ☐ No ☐	
5		Yes ☐ No ☐	
6		Yes ☐ No ☐	
7		Yes ☐ No ☐	
8		Yes ☐ No ☐	
9		Yes ☐ No ☐	
10		Yes ☐ No ☐	
11		Yes ☐ No ☐	
12		Yes ☐ No ☐	
13		Yes ☐ No ☐	
14		Yes ☐ No ☐	
15		Yes ☐ No ☐	
16		Yes ☐ No ☐	
17		Yes ☐ No ☐	
18		Yes ☐ No ☐	
19		Yes ☐ No ☐	
20		Yes ☐ No ☐	

Erosion and Sedimentation Control

Document any of the following issues found on the construction site, and the corrective action(s) required for each.

Issue	Status	Corrective Action Needed
Have all ESC features been constructed before initiating other construction activities?	Yes ☐ No ☐	
Is the contractor inspecting and maintaining ESC devices regularly?	Yes ☐ No ☐	
Is existing vegetation maintained on the site as long as possible?	Yes ☐ No ☐	
Is construction staged so as to minimize exposed soil and disturbed areas?	Yes ☐ No ☐	
Are disturbed areas restored as soon as possible after work is completed?	Yes ☐ No ☐	
Is clean water being diverted away from the construction site?	Yes ☐ No ☐	
Are sediment traps and sediment barriers cleaned regularly?	Yes ☐ No ☐	
Are vegetated and wooded buffers protected and left undisturbed?	Yes ☐ No ☐	
Are soils stabilized by mulching and/or seeding when they are exposed for a long time?	Yes ☐ No ☐	
Has vegetation been allowed to establish itself before flows are introduced to channels?	Yes ☐ No ☐	
Is regular, light watering used for dust control?	Yes ☐ No ☐	
Is excessive soil compaction with heavy machinery avoided, to the extent possible?	Yes ☐ No ☐	

(continued)

Issue	Status	Corrective Action Needed
Are erosion control blankets used when seeding slopes?	Yes ☐ No ☐	
Are trees and vegetation that are to be retained during construction adequately protected?	Yes ☐ No ☐	
Are areas designated as off-limits to construction equipment flagged or easily distinguishable?	Yes ☐ No ☐	
If excavated topsoil has been salvaged and stockpiled for later use on the project, are stockpiles adequately protected?	Yes ☐ No ☐	
Are temporary slope drains or chutes used to transport water down steep slopes?	Yes ☐ No ☐	
Do all entrances to the storm sewer system have adequate protection?	Yes ☐ No ☐	

Overall Site Conditions

Document any of the following issues found on the construction site, and the corrective action(s) required for each.

Issue	Status	Corrective Action Needed
Are slopes and disturbed areas not being actively worked properly stabilized?	Yes ☐ No ☐	
Are material stockpiles covered or protected when not in use?	Yes ☐ No ☐	
Are natural resource areas protected with sediment barriers or other BMPs?	Yes ☐ No ☐	
Are perimeter controls and sediment barriers installed and maintained?	Yes ☐ No ☐	

(continued)

Issue	Status	Corrective Action Needed
Are discharge points and receiving waters free of sediment deposits and turbidity?	Yes ☐ No ☐	
Are storm drain inlets properly protected?	Yes ☐ No ☐	
Is there evidence of sediment being tracked into streets?	Yes ☐ No ☐	
Is trash/litter from the construction site collected and placed in dumpsters?	Yes ☐ No ☐	
Are vehicle/equipment fueling and maintenance areas free of spills and leaks?	Yes ☐ No ☐	
Are potential stormwater contaminants protected inside or under cover?	Yes ☐ No ☐	
Is dewatering from site properly controlled?	Yes ☐ No ☐	
Are portable restroom facilities properly sited and maintained?	Yes ☐ No ☐	
Are all hazardous materials and wastes stored in accordance with local regulations?	Yes ☐ No ☐	

Non-Compliance Actions

The municipality shall provide the site operator with a copy of this report, and notice of the corrective action(s) to be taken. The site operator shall have thirty days from the receipt of the notice to commence curative action of the violation.

EROSION AND SEDIMENTATION CONTROL INSPECTION REPORT

General Information

Project Name			
Project Location			
Inspector's Name			
Site Operator			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	

Subject to USEPA Construction General Permit? Yes ☐ No ☐

If yes, has NOI been approved? Yes ☐ No ☐

If yes, attach approved NOI to this report.

If no, contact contractor immediately to determine status of NOI.

Type of Inspection:

Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐

Describe the weather conditions at time of inspection	
Describe the current phase of construction	

Erosion and Sediment Control (ESC) on Construction Sites

Document any of the following issues found on the construction site, and the corrective action(s) required for each.

Issue	Status	Corrective Action Needed
Have all ESC features been constructed before initiating other construction activities?	Yes ☐ No ☐	
Is the contractor inspecting and maintaining ESC devices regularly?	Yes ☐ No ☐	
Is existing vegetation maintained on the site as long as possible?	Yes ☐ No ☐	
Is construction staged so as to minimize exposed soil and disturbed areas?	Yes ☐ No ☐	
Are disturbed areas restored as soon as possible after work is completed?	Yes ☐ No ☐	
Is clean water being diverted away from the construction site?	Yes ☐ No ☐	
Are sediment traps and sediment barriers cleaned regularly?	Yes ☐ No ☐	
Are vegetated and wooded buffers protected and left undisturbed?	Yes ☐ No ☐	
Are soils stabilized by mulching and/or seeding when they are exposed for a long time?	Yes ☐ No ☐	
Has vegetation been allowed to establish itself before flows are introduced to channels?	Yes ☐ No ☐	
Is regular, light watering used for dust control?	Yes ☐ No ☐	
Is excessive soil compaction with heavy machinery avoided, to the extent possible?	Yes ☐ No ☐	

(continued)

Issue	Status	Corrective Action Needed
Are erosion control blankets used when seeding slopes?	Yes ☐ No ☐	
Are trees and vegetation that are to be retained during construction adequately protected?	Yes ☐ No ☐	
Are areas designated as off-limits to construction equipment flagged or easily distinguishable?	Yes ☐ No ☐	
If excavated topsoil has been salvaged and stockpiled for later use on the project, are stockpiles adequately protected?	Yes ☐ No ☐	
Are temporary slope drains or chutes used to transport water down steep slopes?	Yes ☐ No ☐	
Do all entrances to the storm sewer system have adequate protection?	Yes ☐ No ☐	

Non-Compliance Actions

The municipality shall provide the site operator with a copy of this report, and notice of the corrective action(s) to be taken. The site operator shall have thirty days from the receipt of the notice to commence curative action of the violation.

APPENDIX J

Sanitary Sewer Overflow (SSO) Inventory

Revere SSOs 2013-2024

Compliance Report Period #	Date Start	Time	Location	Final Disposition of SSO	Source of Notification	Cause of Event	Blockage or Hydraulic Limitations within the City's Collection System?	Measures Taken to Stop Event	Estimate of Wastewater Released (gal)	Date of Last SSO that Occurred in this Location
7	1/25/2013	3:00:00 PM	304 Squire Road	Street/Sidewalk	City Workers	Sewer system blockage/collapse	YES	Repaired sewer/cleared blockage & washed and disinfected	<10,000	1/25/2013
7	1/28/2013	2:00:00 PM	339 Salem Street	Street/Sidewalk	Resident	Sewer system blockage/collapse	YES	Repaired sewer/cleared blockage & washed and disinfected	<5,000	1/28/2013
7	2/27/2013	2:30:00 PM	732 Washington Avenue	Street/Sidewalk	N/A	Rain Event	YES	Washed and Disinfected (3 Manholes)	>10,000	2/27/2013
7	4/25/2013	10:00:00 AM	4 Bay Road	Discharge into basement of homeowner	Resident	Sewer blockage in house	NO	Plumber snaked house sewer pipe and cleared blockage, cleaned and disinfected	<10,000	4/25/2013
7	5/13/2013	9:00:00 AM	Washington Avenue at Howard Street	Street/Sidewalk	N/A	Sewer system blockage/collapse	YES	Repaired sewer/cleared blockage & washed and disinfected	<10,000	5/13/2013
7	6/8/2013	1:00:00 PM	46 Neponset Stret	Street/Sidewalk	Resident	Rain Event	YES	Washed and Disinfected	<10,000	6/8/2013
7	6/12/2013	8:30:00 AM	Dix Street	Street/Sidewalk	Resident	Rain Event	YES	Washed and Disinfected	<10,000	6/12/2013
7	6/14/2013	12:30:00 PM	13 Cottage Street	Discharge into basement of homeowner and Street/ Sidewalk	Resident	Rain Event	YES	Repaired sewer/cleared blockage & washed and disinfected	<10,000	6/14/2013
7	6/14/2013	7:00:00 AM	Tuscano and Asti Avenue	Street/Sidewalk	City Workers	Rain Event	YES	Washed and Disinfected	<10,000	6/14/2013
8	7/17/2013	Not Available	Squire Rd. and Quincy	Street/Sidewalk	City Workers	Sewer system blockage/collapse	YES	Repaired sewer/cleared blockage & washed and disinfected	<10,000	1/25/2013
8	7/28/2013	9:00:00 AM	Garfield School	Backup into Property	City Workers	Sewer system blockage/collapse	YES	Repaired sewer/cleared blockage & washed and disinfected	<10,000	8/25/2010
9	3/30/2014	2:00:00 PM	Ocean Ave at West St	Ground Surface, Catch Basin to Receiving water	City Workers	Sewer System Blockage	Yes	Cleard with Jet truck	<10,000	N/A
9	3/31/2014		Furlong Dr at Sewer Pumping Station	Ground Surface, Catch Basin to Receiving water	City Workers	Pump Station Failure,	No	Pump station under rehab	Unknown	5/6/2011
9	5/14/2014	11:00:00 AM	1069 North Road	Ground Surface	City Workers	Blockage on Home owners service, possible broken line	No	The City has tried to make repeated contact with property owner is going through the process with inspectional services to get this issues resolved.	<10,000	N/A
9	5/15/2014	2:00:00 PM	53 Bellingham Ave	Catch Basin	City Workers	Service blockage or collapse	No	Disinfection Treatment	<10,000	N/A
9	5/26/2014	3:00:00 PM	30 Linehurst Rd	Ground Surface	City Workers	Sewer system blockage, handy wipes found on hose	Yes	Cleared with Jet truck	<10,000	N/A
9	6/3/2014	3:00:00 PM	North Marshall st Sewer Pumping Station	Ground Surface	City Workers	Pump Station Failure, Power Failure Reset	No	Reset Breakers, Pump station under rehab	<5000	N/A
10	8/5/2014	5:15:00 PM	204 Ocean Avenue	Ground Surface	City Workers	House Fire	Blockage likely caused by event	Disinfection Treatment	<10,000	N/A
10	8/19/2014	12:00:00 PM	Garfield School Field (50 Avalon Street)	Ground Surface	City Workers	Towels in sewer main	Yes	Cleared with jetter truck	<10,000	8/25/2010
10	8/30/2014	7:00:00 PM	128 North Marshall Street	Ground Surface	City Workers	Pump Station Failure, Power Failure Reset	No	Reset Pumps; Pumps are beling replaced and electircal upgraded under ongoing construction project	<50	6/3/2014
10	10/25/2014	12:00:00 AM	550 Revere Beach Blvd	Catch Basin to Receiving Water	City Workers	Service blockage or collapse	Yes	Disinfection Treatment	>10,000	N/A
10	12/9/2014	4:30:00 PM	130 Eliot Road	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	8/25/2010
10	12/9/2014	4:30:00 PM	83 Tuscano Avenue	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	41/1/10
10	12/9/2014	4:30:00 PM	23 Porter Avenue	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	5/17/2010

Revere SSOs 2013-2024

Compliance Report Period #	Date Start	Time	Location	Final Disposition of SSO	Source of Notification	Cause of Event	Blockage or Hydraulic Limitations within the City's Collection System?	Measures Taken to Stop Event	Estimate of Wastewater Released (gal)	Date of Last SSO that Occurred in this Location
10	12/9/2014	4:30:00 PM	65 Asti Avenue	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	6/14/13
10	12/9/2014	4:30:00 PM	722 Washington Avenue	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	8/25/2010
10	12/9/2014	4:30:00 PM	708 Washington Avenue	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	4/1/2010
10	12/9/2014	4:30:00 PM	61 McKinley Street	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	2/27/13
10	12/9/2014	4:30:00 PM	655 Revere Beach Blvd	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	N/A
10	12/9/2014	4:30:00 PM	620 Revere Beach Blvd	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	N/A
10	12/9/2014	4:30:00 PM	Atwood at Shurtleff Street	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	4/1/2010
10	12/9/2014	4:30:00 PM	105 Douglas Street	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	N/A
10	12/9/2014	4:30:00 PM	116 Broadsound Avenue	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	3/30/10
10	12/9/2014	4:30:00 PM	424 Spring Street	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	N/A
10	12/9/2014	4:30:00 PM	Leonard Rd at Lawrence Road	Ground Surface	City Workers	Rain Event	Yes	Cleared with Jet truck and Disinfection Treatment	>10,000	N/A
10	12/9/2014	4:30:00 PM	41 Roland Road	Basement	City Workers	Rain Event	Yes	Pumped Out Basements		N/A
10	12/9/2014	4:30:00 PM	43 Dana Street	Basement	City Workers	Rain Event	Yes	Pumped Out Basements		N/A
10	12/9/2014	4:30:00 PM	58 Everard Street	Basement	City Workers	Rain Event	Yes	Pumped Out Basements		N/A
10	12/9/2014	4:30:00 PM	56 Oakwood Avenue	Basement	City Workers	Rain Event	Yes	Pumped Out Basements		N/A
10	12/9/2014	4:30:00 PM	52 Oakwood Avenue	Basement	City Workers	Rain Event	Yes	Pumped Out Basements		N/A
10	12/9/2014	4:30:00 PM	555 Washington Avenue	Basement	City Workers	Rain Event	Yes	Pumped Out Basements		N/A
10	12/9/2014	4:30:00 PM	166 Hichborn Street	Basement	City Workers	Rain Event	Yes	Pumped Out Basements		N/A
10	12/9/2014	4:30:00 PM	4 Leonard Road	Basement	City Workers	Rain Event	Yes	Pumped Out Basements		N/A
11	5/8/2015	10:00:00 AM	1 Spray Avenue	Ground Surface	City Workers	Service blockage	Yes	Cleared with jet truck and Disinfection Treatment	<200	
11	2/16/2015	3:30:00 PM	220 Ocean Avenue	Ground Surface	City Workers	Main sewer blockage	Yes	Cleared with jet truck and Disinfection Treatment	<10,000	
11	3/18/2015	8:00:00 AM	Four Points Sheraton Hotel (407 Squire Road)	Basement	City Workers	Service blockage	Yes	Pumped Out Basements	>10,000	
11	3/26/2015	8:00:00 PM	Tuscano Avenue between Asti Avenue and Genva Street	Ground Surface	City Workers	Rain Event	Yes	Disinfection Treatment	>10,000	
11	4/21/2015	6:00:00 AM	Tuscano Avenue between Asti Avenue and Genva Street	Ground Surface	City Workers	Rain Event	Yes	Cleared with jet truck and Disinfection Treatment	<10,000	

Revere SSOs 2013-2024

Compliance Report Period #	Date Start	Time	Location	Final Disposition of SSO	Source of Notification	Cause of Event	Blockage or Hydraulic Limitations within the City's Collection System?	Measures Taken to Stop Event	Estimate of Wastewater Released (gal)	Date of Last SSO that Occurred in this Location
11	5/20/2015	9:00:00 AM	40 Everard Street	Basement	City Workers	Sewer main block	Yes	Cleared with jet truck and Disinfection Treatment	<10,000	
11	6/17/2015	12:30:00 PM	1 Linehurst Street	Ground Surface	City Workers	Sewer main block	Yes	Cleared with jet truck and Disinfection Treatment	<10,000	
11	6/19/2015	7:00:00 AM	11 Bellingham Avenue	Ground Surface	City Workers	Service blockage	Yes	Disinfection Treatment	<10,000	
12	8/11/2015	1:00:00 PM	Revere Beach Parkway at Charles Ave	Ground Surface	City Workers	Collapsed Sewer Main	Yes	Replaced sections of sewer and water main	<5,000	11/21/2011
12	9/14/2015	7:00:00 PM	5, 11, 15 South Ave	Building	City Workers	Residents used toilet while sewer was being lined (Residents were notified to not use toilets)	Yes	Serv Pro was called to clean the area of back up and the services were cut from the CIPPL liner	<100	None
12	9/30/2015	11:30:00 AM	Sachem Street	Catch Basin	City Workers	Rain Event	Yes	Areas of SSO were cleaned after storm subsided	>10,000	12/9/2014
12	9/30/2015	11:30:00 AM	Atwood St @ Hawes St	Catch Basin	City Workers	Rain Event	Yes	Areas of SSO were cleaned after storm subsided	>10,000	12/9/2014
12	9/30/2015	11:30:00 AM	Asti St @ Tuscano St	Catch Basin	City Workers	Rain Event	Yes	Areas of SSO were cleaned after storm subsided	>10,000	4/21/2015
12	9/30/2015	11:30:00 AM	Geneva St @ Tuscano St	Catch Basin	City Workers	Rain Event	Yes	Areas of SSO were cleaned after storm subsided	>10,000	4/21/2015
12	9/30/2015	11:30:00 AM	Gage Ave @ Groves Ave	Catch Basin	City Workers	Rain Event	Yes	Areas of SSO were cleaned after storm subsided	>10,000	None.
12	9/30/2015	11:30:00 AM	31 Gore Rd	Catch Basin	City Workers	Rain Event	Yes	Areas of SSO were cleaned after storm subsided	>10,000	None
12	9/30/2015	11:30:00 AM	229 Washington Ave	Catch Basin	City Workers	Rain Event	Yes	Areas of SSO were cleaned after storm subsided	>10,000	None
12	9/30/2015	11:30:00 AM	Dunn Road	Catch Basin	City Workers	Rain Event	Yes	Areas of SSO were cleaned after storm subsided	>10,000	6/8/2013
12	10/2/2015	7:00:00 PM	176 Revere Street	Basement	City Workers	Contractor did not cut out sewer service coupon after CIPPL of service	Yes	Serv Pro was called to clean the area of back up and the services were cut from the CIPPL liner	<1000	None
12	10/11/2015	6:00:00 PM	Everett Street	Catch Basin	City Workers	Large amount of paper product flushed into sewer	Yes	Blockage Jetted and Vactored, Public outreach to specific buildings in the area	<2000	None
12	11/17/2015	7:30:00 AM	North Marshall Sewer Station	Ground Surface	City Workers	Pump Failure	No	Area was cleaned and Pumps were reset. Alarming issue is being looked into	<1000	8/30/2014
12	11/27/2015	12:30:00 PM	Wait Park Sewer Station	Ground Surface	City Workers	Sewer main block	Yes	Main was Jetted and then disinfected	>5,000	3/30/10
13	2/1/2016	7:25:00 AM	166 Hitchborn St	Building	City Workers	Sewer main block due to grease	No	Cleaned sewer blockage with jet truck. Cleaned area of spill.	<10,000	
13	4/19/2016	4:00:00 PM	1559 North Shore Rd. - Assalam Market	Building	City Workers	Back up in building sewer service caused surcharge in basement	No	Area basement cleaned, system back to normal.	<2,000	
13	4/15/2016	9:00:00 AM	12 Goodwin Ave	Front Yard	City Workers	Sewer service collapse	No	Area of SSO cleaned. Home owner contracted service repair	<300	
13	5/26/2016	8:30:00 AM	11 and 15 Bellingham Ave.	City Street	City Workers	Sewer service collapse	No	Residents warned of violation by City. Repair is underway.	30 gallos/half hour	
13	6/7/2016	8:15:00 AM	61, 65, and 70 Thornton St.	Building	City Workers	Sewer main block due to grease	No	Cleaned sewer blockage with jet truck. Cleaned area of spill.	<10,000	
13	6/13/2016	10:00:00 AM	201 American Legion Highway	Auto garage	City Workers	Sewer main block due to grease	No	Cleaned sewer blockage with jet truck. Cleaned area of spill.	<500	
13	6/30/2016	9:00:00 AM	Ocean Ave. Behind 55 Revere Beach Blvd.	City Street	City Workers	Sewer main block due to grease	No	Cleaned sewer blockage with jet truck. Cleaned area of spill.	<100	

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Compliance Report Period #	Date Start	Time	Location	Final Disposition of SSO	Source of Notification	Cause of Event	Blockage or Hydraulic Limitations within the City's Collection System?	Measures Taken to Stop Event	Estimate of Wastewater Released (gal)	Date of Last SSO that Occurred in this Location
14	7/12/2016	10:00:00 AM	36 Crest Ave, 42 Bellingham Ave	Back yard	City Workers	Sewer service pipe collapse	No	None - City workers informed home owner at 36 Crest Ave that they wil have to address the issue.	<200	
14	7/22/2016	10:00:00 AM	55, 45, 41 Revere Beach Blvd	City Street	City Workers	Sewer main blockdue to wipes and grease	No	Jet cleaned 300 feet of main in either direction. Area of SSO cleaned.	<1,000	
14	8/4/2016	10:00:00 AM	25 Winthrop Ave - Revere Senior Center	Basement	City Workers	Sewer service block	No	Area of SSO cleaned. Building owner contracted service cleaning.	<200	
14	8/23/2016	9:00:00 AM	25 Winthrop Ave - Revere Senior Center	Basement	City Workers	Sewer service block	No	Area of SSO cleaned. Building owner contracted service cleaning.	<200	
14	9/29/2016	8:15:00 AM	18 Proctor Ave		City Workers	Sewer main block due to grease	No	Cleaned sewer blockage with jet truck. Cleaned area of spill.	<200	
14	10/11/2016	10:00:00 AM	700 Washington Ave	City Street	City Workers	Rain Event	Yes	Cleaned area around surcharged manhole following completion of the storm.	>1,000	
14	10/11/2016	10:49:00 AM	Tuscano Rd & Asti Ave	City Street	City Workers	Rain Event	Yes	Cleaned area around surcharged manholes (2) following completion of the storm.	>1,000	
14	10/11/2016	1:30:00 PM	McLeary & Howard Street	City Street	City Workers	Rain Event	Yes	Jet cleaned sewer main and cleaned area around surcharged manhole	>1,000	
14	10/18/2016	3:00:00 AM	281 Lee Burbank Hwy	City Street	City Workers	Sewer main block	No	Jet cleaned sewer main and cleaned area around surcharged manhole	<500	
14	11/28/2016	2:30:00 PM	95 Squire Rd - Barn Car Wash	City Street	City Workers	Sewer service block	No	Area of SSO cleaned. Building owner contracted service cleaning.	<1,000	
14	12/30/2016	9:30:00 AM	Everard Street	City Street	City Workers	Sewer main block	No	Jet cleaned sewer main and cleaned area around surcharged manholes (2)	<1,000	
15	1/24/2017	8:30:00 AM	Brenton Street and Glover Street	City Street	Home owner	Sewer main block	No	City workers cleaned the blockage and disinfected the area	<1,000	
15	2/23/2017	8:30:00 AM	34-35 Green Street Trailer Park	Surface water body (Seals Creek)	Private call to DPW	Sewer main block	No	City workers pumped out the system and cleaned the block. City workers also cleaned the area and reconnected the broken sewer pipes.	>1,000	
15	3/9/2017	7:00:00 AM	18 Proctor Ave	City Street	Private call to DPW	Sewer main block	No	The area was cleaned and the sewer main block was cleared.	<500	
15	3/29/2017	2:30:00 PM	19 Pratt Street-Lees Trailer Park	Ground surface	City Staff	Private service failure	No	The area was cleaned and the private plumbing was fixed.	< 200	
15	4/1/2017	8:00:00 AM	Bryant Street	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed. Multiple sewer main blocks were cleared as well.	>1,000	
15	4/1/2017	8:00:00 AM	575 Washington Street	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed. Multiple sewer main blocks were cleared as well.	>1,000	
15	4/1/2017	8:00:00 AM	Asti Ave & Tuscano Ave	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed. Multiple sewer main blocks were cleared as well.	>1,000	
15	4/1/2017	8:00:00 AM	Tuscano Ave	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed. Multiple sewer main blocks were cleared as well.	>1,000	
15	4/1/2017	8:00:00 AM	732 Washington Ave	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed. Multiple sewer main blocks were cleared as well.	>1,000	
15	4/1/2017	8:00:00 AM	Eliot & Porter Street	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed. Multiple sewer main blocks were cleared as well.	>1,000	
15	4/1/2017	8:00:00 AM	662 Revere Beach Blvd	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed. Multiple sewer main blocks were cleared as well.	>1,000	
15	4/1/2017	8:00:00 AM	Waitt Park Sewer Station	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed. Multiple sewer main blocks were cleared as well.	>1,000	
15	4/3/2017	8:00:00 AM	Waitt Park Sewer Station	Ground surface	City Staff	Pump station failure	No	City workers cleaned the pump station and got it up and running again.	>1,000	

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15	4/4/2017	5:30:00 PM	38 Bateman Ave	City Street/Basement	Private call to DPW	Sewer main block	No	The blockage in the main was cleared so that the backup into the homeowners basement stopped. The City sidewalk was disinfected.	<500	
15	4/7/2017	9:30:00 PM	Porter Street and Eliot Street	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed.	>1,000	
15	4/7/2017	9:30:00 PM	Bryant Street	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed.	>1,000	
15	4/7/2017	9:30:00 PM	575 Washington Street	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed.	>1,000	
15	4/7/2017	9:30:00 PM	Asti Ave and Tuscano Ave	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed.	>1,000	
15	4/7/2017	9:30:00 PM	662 Revere Beach Blvd	City Streets	City Staff	Rain Event	Yes	City workers went to each effected areas and disinfected areas as needed.	>1,000	
15	4/19/2017	4:00:00 PM	44 Garfield Ave	City Street	City Staff	Sewer main block	No	The homeowners service had collapsed and they were pumping sewage to the sidewalk via a sump pump. The homeowner hired a company to fix the service and city workers cleaned the area.	<2,000	
15	5/2/2017	11:00:00 AM	1235 North Shore Road	City Street	City Staff	Pipe collapse	No	The sewer service was leaking to the exterior of the building. The homeowner hired a company to fix the problem and city staff cleaned the area.	<1,000	
15	5/4/2017	3:00:00 PM	551-549 Broadway	Basement	Private call to DPW	Pipe collapse/Sewer main block	No	The homeowner hired a company to fix the service and city staff cleaned the area.	<500	
15	5/24/2017	8:30:00 AM	144 Broadsound Ave	City Street	City Staff	Pipe collapse	No	The sewer service was leaking. The homeowner hired a company to fix the problem and the city staff cleared the area.	<200	
16	9/30/2017	9:00:00 AM	Eliot Road and Porter Avenue	Ground Surface	City Staff	Rain Event	Yes	City workers cleaned and disinfected each area as necessary.	<10,000	
16	9/30/2017	11:30:00 AM	Everard Street and Cottage Street		City Staff	Rain Event	Yes	City workers cleaned and disinfected each area as necessary.	<10,000	
17	1/13/2018	8:00:00 AM	57 Agawam Street	Catch basin	City Staff	Sewer main block	Yes	Jet cleaned sewer main and cleaned area around surcharged.	<1,000	
17	1/22/2018	11:00:00 AM	Waitt Park Pump Station	City Street	City Staff	Pump station failure	No	Area of SSO cleand with jet truck and disinfected.	<100	
17	1/26/2018	8:30:00 AM	Waitt Park Pump Station	City Street	City Staff	Pump station failure	No	Area of SSO cleaned and disinfected.	>500	
17	1/29/2018	2:00:00 PM	11-15 Bellingham Avenue	Catch basin	City Staff	Sewer service pipe collapse	No	Owner said they would have contractor repair sewer service the next day.	<100	
17	2/2/2018	11:00:00 AM	5 Green Street	Direct to Receiving Waters (Sales Creek)	City Staff	Sewer main block	Yes	Jet cleaned sewer main and cleaned area around surcharged manhole	>1,000	
17	2/16/2018	8:30:00 AM	151 VFW Parkway	Catch basin	City Staff	Sewer service pipe collapse	No	Owner had sewer service jet-cleaned by drain cleaning company. Area of SSO cleaned.	<1,000	
17	2/28/2018	12:30:00 PM	47 Bryant Street	City Street	City Staff	Rain Event	Yes	Cleaned area around surcharged manhole following completion of the storm.	>10,000	
17	3/3/2018	11:30:00 AM	Numerous locations inundated by coastal flooding	City Street	City Staff	Rain Event	Yes	Severe flooding across City caused by very heavy rain event. SSOs across city were cleaned following completion of storm.	>10,000	
17	4/3/2018	8:30:00 AM	34-38 Hillside Avenue	Catch basin	City Staff	Sewer main collapse	No	Sewer main repaired on 4-3-18.	>5,000	
17	5/17/2018	2:00:00 AM	63 Bennington Street	Catch basin	City Staff	Sewer main block	Yes	Sewer main block due to mop head and rags found. Jet cleaned sewer main and cleaned area around surcharged manhole	<500	
17	5/24/2018	9:00:00 AM	141 Pemberton Street	Basement	City Staff	Sewer main block	Yes	Area of SSO cleaned. Building owner contracted service cleaning.	<100	
17	6/2/2018	11:00:00 AM	Linehurst Pump Station	City Street	City Staff	Pump station failure caused manhole surcharge	No	Area of SSO cleaned and pumped down. City staff reset pump.	<500	

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17	6/6/2018	3:00:00 PM	34-38 Hillside Avenue	City Street	City Staff	Sewer main collapse	No	Sewer bypass installed by city for temporary diversion. Cleaned area around surcharged manhole. New 6" sewer main to be installed.	<500	
17	6/26/2018	7:00:00 PM	101 Rice Avenue	Catch basin	City Staff	Sewer main block due to rags and sump pump discharge	Yes	Cleaned sewer blockage and with jet truck. Cleaned area of spill.	<1,000	
17	6/28/2018	11:00:00 AM	91 Rice Avenue	Basement	City Staff	Sewer main block	Yes	Area of SSO cleaned. Building owner contracted service cleaning.	<500	
17	6/29/2018	10:30:00 AM	33 Lucia Avenue	Catch basin	City Staff	Sewer main block and sump pump discharge	Yes	Cleaned sewer blockage and with jet truck. Cleaned area of spill.	<200	
18	7/4/2018	1:00:00 PM	19 Montfern Avenue	Catch basin	Homeowner	Broken Service Lateral	No	Cleaned and disinfected sewer service.	<100	
18	7/23/2018	9:00:00 AM	53 Eliot Road	Catch basin	City Staff	Sewer System Blockage (MWRA Screen House Event)	No	MWRA fixed the closed screen and system went back to normal.	>10,000 (total)	
18	7/23/2018	9:00:00 AM	130 Eliot Road	Catch basin	City Staff	Sewer System Blockage (MWRA Screen House Event)	No	MWRA fixed the closed screen and system went back to normal.	>10,000 (total)	
18	7/23/2018	9:00:00 AM	23 Porter Avenue	Catch basin	City Staff	Sewer System Blockage (MWRA Screen House Event)	No	MWRA fixed the closed screen and system went back to normal.	>10,000 (total)	
18	7/23/2018	9:00:00 AM	176 Garfield Avenue	Catch basin	City Staff	Sewer System Blockage (MWRA Screen House Event)	No	MWRA fixed the closed screen and system went back to normal.	>10,000 (total)	
18	8/12/2018	6:00:00 AM	Asti Avenue and Tuscano Avenue	Catch basin	City Staff	Rain Event	Yes	SSO areas were washed and disinfected by City staff.	>10,000 (total)	
18	8/12/2018	6:00:00 AM	47 Bryant Street	Catch basin	City Staff	Rain Event	Yes	SSO areas were washed and disinfected by City staff.	>10,000 (total)	
18	8/12/2018	6:00:00 AM	655 Revere Beach Boulavard	Catch basin	City Staff	Rain Event	Yes	SSO areas were washed and disinfected by City staff.	>10,000 (total)	
18	8/12/2018	6:00:00 AM	184 Eliot Street	Catch basin	City Staff	Rain Event	Yes	SSO areas were washed and disinfected by City staff.	>10,000 (total)	
18	8/12/2018	6:00:00 AM	176 Garfield Avenue	Catch basin	City Staff	Rain Event	Yes	SSO areas were washed and disinfected by City staff.	>10,000 (total)	
18	8/12/2018	6:00:00 AM	732 Washington Avenue	Catch basin	City Staff	Rain Event	Yes	SSO areas were washed and disinfected by City staff.	>10,000 (total)	
18	8/21/2018	7:50:00 PM	5 Ward Street	Catch basin	City Staff	Service Lateral Blockage	No	Drain was cleaned and blockage was cleared out.	<500	
18	8/23/2018	8:00:00 AM	5 Ward Street	Catch basin	City Staff	Service Lateral Blockage	No	Grease blockage was cleared out and area was disinfected.	>500	
18	9/9/2018	2:00:00 PM	69 Malden Street	Basement	City Staff	Sewer System Blockage	No	Cleaned and disinfected sewer service.	<200	
18	9/23/2018	10:00:00 AM	Pratt Street	Ground Surface	City Staff	Sewer System Blockage	No	City found problem and cleaned out and disinfected sewer.	<200	
18	9/24/2018	8:00:00 AM	2 Washington Street	Catch basin	Homeowner	Sewer System Blockage	No	City cleaned line and disinfected area.	>200	
18	10/3/2018	9:00:00 AM	149 Squire Road	Catch basin	City Staff	Sewer System Blockage	No	City disinfected and washed down area.	<30	
18	11/26/2018	9:00:00 AM	Asti Avenue and Tuscano Avenue	Catch basin	City Staff	Rain Event	Yes	City cleaned and disinfected.	>10,000 (total)	
18	11/26/2018	9:00:00 AM	Tuscano Avenue	Catch basin	City Staff	Rain event	Yes	City cleaned and disinfected.	>10,000 (total)	
18	11/26/2018	9:00:00 AM	1 Orr Square	Catch basin	City Staff	Rain event	Yes	City cleaned and disinfected.	>10,000 (total)	

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18	11/26/2018	9:00:00 AM	720 Washington Avenue	Catch basin	City Staff	Rain event	Yes	City cleaned and disinfected.	>10,000 (total)	

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City of Revere, Massachusetts
SSO Inventory Table

Date Start	Time	Location	Final Disposition of SSO	Source of Notification	Cause of Event	Blockage or Hydraulic Limitations with the City's Collection System?	Measures Taken to Stop Event	Date Mitigated	Estimate Wastewater Released (gal)	Mitigation Plan
2/9/2019	4:00p	321 Charger Street	Ground surface	City staff	Sewer system blockage	No	City tried to clear the line and found a collapse. Pumped out manhole and cleaned out/disinfected area. Told gym not to use. Contractor of new building is going to fix.		<500	
4/27/2019	1:00p	40 Everard Street	Catch basin	City staff	Sewer system blockage	No	Cleaned and disinfected the area		<500	
7/2/2021	4:30a	Elliot Road & Porter Avenue	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/2/2021	500	Ongoing inflow and infiltration program
7/2/2021	4:00a	649 Revere Beach Blvd.	Ground surface	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/2/2021	>1,000	Ongoing inflow and infiltration program
7/2/2021	4:30a	Toscano Ave & Asti Avenue	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/2/2021	>500	Ongoing inflow and infiltration program
7/2/2021	4:00a	750 Washington Avenue	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Flowed for a few hours and went down by 5:30a; system went back to normal. Washed area and disinfected.	7/2/2021	>500	Ongoing inflow and infiltration program
7/9/2021	12:00p	116 & 134 Broad sound Avenue	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/10/2022	>1,000	Ongoing inflow and infiltration program
7/9/2021	12:00p	130 Elliot Road	-	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/10/2022	>1,000	Ongoing inflow and infiltration program
7/9/2021	12:00p	23 Porter Street	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/10/2022	>1,000	Ongoing inflow and infiltration program
7/9/2021	1:00p	637 Revere Beach Blvd	Discharged into basement and bathroom	Homeowner	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected area around the manhole by owner; suggested resident to install check valve	7/9/2022	<500	Ongoing inflow and infiltration program
7/9/2021	12:00p	658 Revere Beach Blvd	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/10/2022	>5,000	Ongoing inflow and infiltration program
7/9/2021	12:00p	Tuscano Ave & Asti Avenue	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/10/2022	>10,000	Ongoing inflow and infiltration program
7/9/2021	12:00p	Tuscano & Geneva Street	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/12/2022	>10,000	Ongoing inflow and infiltration program
7/9/2021	12:00p	726 Washington Avenue	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/10/2022	>10,000	Ongoing inflow and infiltration program
8/19/2021	1:00p	Tuscano Ave & Asti Avenue	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	8/19/2021	>1,000	Ongoing inflow and infiltration program
8/19/2021	1:00p	Tuscano Avenue	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	8/19/2021	>1,000	Ongoing inflow and infiltration program
9/2/2021	1:00p	726 Washington Avenue	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	8/19/2021	>1,000	Ongoing inflow and infiltration program
9/2/2021	2:00a	110 Asti Ave & Asti and Toscano Ave	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	8/19/2021	>5,000	Ongoing inflow and infiltration program
9/2/2021	2:00a	154 & 116 Broad sound Avenue	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	8/19/2021	>5,000	Ongoing inflow and infiltration program
9/2/2021	2:00a	111 Elliot Road	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	9/2/2021	>5,000	Ongoing inflow and infiltration program
9/2/2021	2:00a	Hawes St & Atwood Street	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	9/2/2021	>5,000	Ongoing inflow and infiltration program
9/2/2021	2:00a	25 Porter Street	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	9/3/2021	>5,000	Ongoing inflow and infiltration program
9/2/2021	2:00a	658 Revere Beach Blvd	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	9/3/2021	>5,000	Ongoing inflow and infiltration program
9/2/2021	2:00a	Tuscano Avenue	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	9/2/2021	>5,000	Ongoing inflow and infiltration program
9/2/2021	2:00a	726,708,658 Washington Avenue	Catch basin to receiving water	City of Revere DPW	Heavy Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	9/2/2021	>5,000	Ongoing inflow and infiltration program
3/14/2023	10:35a	Porter Street and Elliot Street	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/14/2023	>5,000	Ongoing inflow and infiltration program
3/14/2023	6:00p	651 Revere Beach Blvd	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/15/2023	8,000	Ongoing inflow and infiltration program
3/14/2023		321 Charger Street	-	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/14/2023	-	Ongoing inflow and infiltration program
3/14/2023	11:00a	end of Bryant Street	Ground Surface	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/15/2023	>5,000	Ongoing inflow and infiltration program
3/14/2023	10:17a	Asti Avenue and Toscano Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/15/2023	>5,000	Ongoing inflow and infiltration program
3/14/2023	10:30a	Philomena and Malino Street	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/14/2023	<2,000	Ongoing inflow and infiltration program
3/14/2023	10:17a	92 Asti Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/15/2023	<5,000	Ongoing inflow and infiltration program
3/14/2023	2:00p	21 Porter Street	Catch basin to receiving water	Homeowner	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/15/2023	>5,000	Ongoing inflow and infiltration program
3/14/2023	3:15p	58 Hawes Street	-	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/14/2023	-	Ongoing inflow and infiltration program
3/14/2023	12:00p	Atwood and Hawes Street	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/15/2023	>10,000	Ongoing inflow and infiltration program
3/14/2023	1:17p	Geneva and Tuscano Street	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/15/2023	<2,000	Ongoing inflow and infiltration program
3/15/2023	1:00a	658 Revere Beach Blvd	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/15/2023	>5,000	Ongoing inflow and infiltration program
3/15/2023	1:00a	647 Revere Beach Blvd	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/15/2023	>5,000	Ongoing inflow and infiltration program

Revere SSOs 2013-2024

Date Start	Time	Location	Final Disposition of SSO	Source of Notification	Cause of Event	Blockage or Hydraulic Limitations with the City's Collection System?	Measures Taken to Stop Event	Date Mitigated	Estimate Wastewater Released (gal)	Mitigation Plan
3/26/2023	5:00p	151 VFW Parkway	Ground Surface	City of Revere DPW	Sewer System Blockage	Blockage	Cleaned and disinfected the area	3/26/2023	<200	Ongoing inflow and infiltration program
4/26/2023	5:00p	Everard Street and Corrage Street	Ground Surface	City of Revere DPW	Sewer Blockage	Surcharged as they were jetting out the line	Cleaned and disinfected the area	4/26/2023	<100	Ongoing inflow and infiltration program
7/21/2023	10:45p	Washington Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/22/2023	> 20000	Ongoing inflow and infiltration program
7/21/2023	11:00p	Everard Street and Corrage Street	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/22/2023	> 4000	Ongoing inflow and infiltration program
7/21/2023	11:10p	Elliot Road and Porter Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/22/2023	> 12000	Ongoing inflow and infiltration program
7/21/2023	11:30p	Asti Avenue and Tuscano Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/22/2023	> 16000	Ongoing inflow and infiltration program
7/29/2023	7:15p	Asti Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/30/2023	> 8000	Ongoing inflow and infiltration program
7/29/2023	8:15p	Eliot Road and Curtis Street	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	7/30/2023	> 12000	Ongoing inflow and infiltration program
12/11/2023	8:00a	Washington Avenue and Grover Street	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	12/11/2023	> 3000	Ongoing inflow and infiltration program
12/11/2023	8:00a	Asti Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	12/11/2023	> 5000	Ongoing inflow and infiltration program
12/11/2023	8:15a	Atwood Street	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	12/11/2023	> 2800	Ongoing inflow and infiltration program
1/10/2024	6:30a	Asti Avenue and Tuscano Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	1/10/2024	> 16000	Ongoing inflow and infiltration program
1/10/2024	7:05a	Washington Avenue and Marble Street	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	1/10/2024	> 15250	Ongoing inflow and infiltration program
1/10/2024	7:10a	Eliot Road	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	1/10/2024	> 15000	Ongoing inflow and infiltration program
1/10/2024	8:15a	Revere Beach Boulevard	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	1/10/2024	> 15000	Ongoing inflow and infiltration program
1/10/2024	8:00p	Revere Beach Boulevard	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	1/10/2024	> 2000	Ongoing inflow and infiltration program
1/13/2024	9:15a	Washington Avenue and Marble Street	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	1/13/2024	> 12250	Ongoing inflow and infiltration program
1/13/2024	9:15a	Asti Avenue and Tuscano Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	1/13/2024	> 10250	Ongoing inflow and infiltration program
1/13/2024	9:30a	655 Revere Beach Boulevard	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	1/14/2024	> 46000	Ongoing inflow and infiltration program
1/13/2024	9:30a	Eliot Road and Porter Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	1/13/2024	> 12000	Ongoing inflow and infiltration program
3/23/2024	7:30p	Asti Avenue and Tuscano Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/24/2024	> 7000	Ongoing inflow and infiltration program
3/23/2024	7:50p	Eliot Road and Porter Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/24/2024	> 6000	Ongoing inflow and infiltration program
3/29/2024	9:30a	655 Revere Beach Parkway	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/29/2024	> 10500	Ongoing inflow and infiltration program
3/29/2024	9:30a	Asti Avenue and Tuscano Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	3/29/2024	> 9500	Ongoing inflow and infiltration program
4/4/2024	8:15a	Asti Avenue and Tuscano Avenue	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	4/5/2024	> 19500	Ongoing inflow and infiltration program
4/4/2024	10:30a	Washington Avenue and Marble Street	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	4/4/2024	> 5500	Ongoing inflow and infiltration program
4/4/2024	12:30p	655 Revere Beach Parkway	Catch basin to receiving water	City of Revere DPW	Rain Event	Insufficient Capacity in System	Cleaned and disinfected the area	4/5/2024	> 17000	Ongoing inflow and infiltration program

APPENDIX K

Operations and Maintenance (O&M) Plan

OPERATION AND MAINTENANCE PLAN FOR MUNICIPAL ACTIVITIES AND FACILITIES

Revere, Massachusetts

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1.0 INTRODUCTION

1.1 Requirement for Standard Operating Procedures

The 2016 Massachusetts MS4 General Permit, which came into effect on July 1, 2018, regulates discharges from small municipal separate storm sewer systems (MS4s) to waters of the United States. The Permit requires MS4 operators to develop, implement, and enforce a stormwater management program (SWMP). The purpose of the SWMP is to reduce the discharge of pollutants from the MS4 to the maximum extent practicable, to protect water quality, and to satisfy the applicable water quality requirements of the Clean Water Act. MS4 operators implement various Best Management Practices (BMPs) for each of six minimum control measures. These minimum control measures are as follows:

- Public Education and Outreach
- Public Involvement/Participation
- Illicit Discharge Detection and Elimination
- Construction Site Stormwater Runoff Control
- Post-Construction Stormwater Management in New Development and Redevelopment
- Good Housekeeping and Pollution Prevention for Municipal Operations

As part of the minimum control measure for Good Housekeeping and Pollution Prevention for Municipal Operations, Section 2.3.7 of the 2016 MS4 Permit requires regulated communities to develop and implement a written Operations and Maintenance (O&M) program for municipal activities and facilities. The O&M program serves to prevent or reduce pollutant runoff and protect water quality, and is required to include the following components:

1. Written O&M procedures for the following activities/facilities:
    a. Parks and open space
    b. Buildings and facilities where pollutants are exposed to stormwater runoff
    c. Vehicles and equipment
2. An inventory of all permittee-owned facilities
3. A written program outlining the necessary actions the permittee will implement so that the MS4 is properly maintained to reduce the discharge of pollutants from the MS4, including:
    a. Optimization of routine inspections, cleaning and maintenance of catch basins
    b. Implementation of procedures for sweeping and/or cleaning streets and municipally owned parking lots
    c. Proper storage and disposal of catch basin cleanings and street sweepings
    d. Implementation of procedures for winter road maintenance
    e. Implementation of inspection and maintenance frequencies and procedures for storm drain systems and stormwater treatment structures
4. Written records for all maintenance activities, inspections and training.

To address these requirements, Standard Operating Procedures (SOPs) associated with these municipal activities and facilities were taken and/or adapted from templates developed by EPA and the Central Massachusetts Regional Stormwater Coalition (CMRSWC). These templates were developed for use by MS4 communities in complying with the permit requirements outlined above. These pre-developed SOPs can be implemented by the city or adjusted to fit current practices as long as these practices meet all MS4 requirements.

1.2 Applicability

The operation and maintenance procedures outlined in this document and the accompanying SOPs apply to all the facilities, vehicles, and equipment denoted in the inventory included in Appendix A, as well as any activities associated with each facility, vehicle, or piece of equipment. They shall also apply to all drainage infrastructure owned or operated by the City. The inventory will be updated annually to reflect any changes in property or equipment ownership.

2.0 PARKS AND OPEN SPACE

2.1 Overview

The City of Revere's Department of Public Works (DPW) performs regular maintenance on parks and open spaces to ensure aesthetic appeal throughout the city. Maintenance consists of mowing, weeding, pruning, mulching, irrigation, and solid waste management. The City of Revere hires a private company to fertilize a portion of their fields and parks. Stormwater pollutants that can be generated from these activities include nutrients, pesticides, organics, sediment, trash, and bacteria.

The City of Revere owns and maintains the following parks and open spaces:

- Costa Park
- Della Russo Stadium
- Gibson Park
- Griswold Park
- Harmon Park
- Liberty Park
- Louis Pasteur Park
- Neponset Street Park
- Oak Island/ Destoop Park
- Paws & Play Dog Park
- Pearl Avenue/ Orchard Street Park
- Police Station Basketball Court
- Rose Street Federal Development Tot Lot
- Sonny Meyers Park
- State Veteran's Development Basketball Court
- Beachmont School/Frederick Park/ Repucci Park
- Garfield School/ Curtis Park
- Hill School Playground
- Lincoln Tot Lot
- McKinley School Playground
- Paul Revere School/ Consiglia Della Russo Park
- Revere High School Veteran's Field/ Ambrose Park/ Erricola Park
- Whelan School/ Ciarlone Tot Lot/ DiSalvo Park
- American Legion Park
- Beachmont Community Park
- Belle Isle Marsh
- Destasio/ Oxford Street Park
- Dunn Road Conservation Land
- Jacobs Park
- Leverett Avenue/ Edward Leach Park
- North Revere Conservation Area
- North Shore Conversation Land
- Northern Strand Community Strand
- Oak Island Marsh
- Pines River
- Pines Road Boat Launch
- Recreation Center
- Revere Society for Cultural and Historic Preservation
- Rumney Marsh
- Rumney Marsh Burial Ground

This list and detailed use information for each park and open space can be found in Appendix A.

2.2 Operation and Maintenance Activities

The City of Revere performs most of the maintenance for the locations listed above in house. All lawns are cut, weeded, irrigated, and seeded/reseeded by the City. The City is also responsible for trimming and pruning trees and shrubs, maintaining mulch in shrub beds, and removing leave litter every fall. All trash and yard waste is disposed of with City solid waste.

Appendix B Provides Standard Operating Procedures that the City should follow for all operation and maintenance activities in its parks and open spaces, including:

- B.1 Parks and Open Space Management

3.0 MUNICIPAL BUILDINGS AND FACILITIES

3.1 Overview

Revere owns and operates a variety of different buildings that have the potential for pollutants to be exposed to stormwater runoff. A complete list and the location can be seen in APPPENDIX A. Below is the list of Municipal buildings owned and operated by the City of Revere:

- City Hall
- Public Library
- Rossetti-Cowan Senior Center
- American Legion Building
- Revere Historical Society
- McKinley School
- Police Department
- Fire Stations (#1, #2, #3, #4, #5)
- Fire Department Storage
- DPW Facility
- Parks and Recreation Office
- A.C. Whelan Elementary School
- Abraham Lincoln School
- Beachmont Veterans Memorial School
- Garfield Elementary School
- Garfield Middle School
- Paul Revere Innovation School
- Revere High School
- Rumney Marsh Academy
- SeaCoast High School
- Staff Sergeant James J. Hill Elementary School
- Susan B. Anthony Middle School

3.2 Use, Storage, and Disposal of Petroleum Products and Other Stormwater Pollutants

The City has restrictions in place regarding the use, storage, and disposal of petroleum products and other stormwater pollutants to prevent the potential for polluted stormwater. Red, leak-proof gas cans are used for handing and temporary storage of flammable liquids such as gasoline. Vehicle maintenance oils, fluids, and waste oil are stored at the Department of Public Works with secondary containment.

There is a fuel island located at the DPW facility, where gasoline and diesel trucks are refueled.

Appendix C provides Standard Operating Procedures that the City should follow for the use, storage, and disposal of petroleum or other hazardous products utilized at municipal facilities, including:

- C.1: Fuel and Oil Handling
- C.2: Hazardous Materials Storage and Handling

3.3 Employee Training

The City has developed an employee training program, which provides information regarding stormwater pollution prevention and good housekeeping practices for municipal operations. Management practices included as part of the training program consist of: (1) minimizing and preventing exposure of vehicles and equipment to stormwater, (2) good housekeeping operations, (3) preventative maintenance, (4) spill prevention and response, (5) erosion and sediment control, (6) stormwater runoff management, (7) management of salt and piles containing salt and (8) maintenance of control measures. Training on the proper use, storage, and disposal of petroleum products is also included.

The City has a Stormwater Pollution Prevention Plan (SWPPP) in place for the Department of Public Works Facility at 319 Charger St. Employees complete annual training on the management practices outlined in the SWPPP.

3.4 Spill Prevention and Response

The DPW has a Spill Prevention and Response Plan. A copy of the plan is kept at the DPW Facility, and employees are trained on its contents once annually. The plan includes written procedures for the proper disposal of used absorbent/spill containment material.

In addition to the Spill Prevention and Response plan, other Good Housekeeping measures are in place to minimize the risk of spilled pollutants entering nearby surface waters. All transfers to and from fuel oil and chemical tanks on site are observed by qualified personnel trained in spill response procedures. Hydraulic equipment is kept in good repair to prevent leaks. Equipment and vehicles are regularly inspected to avoid situations that may result in leaks, spills, and other releases of pollutants that could be conveyed with stormwater to receiving waters. The fueling area at the DPW Facility is also regularly inspected for signs of spills or leaks, which includes inspection of hoses and fittings. Any spills are cleaned up immediately or are properly marked by barricades. Grease and oil spills are treated with an absorbent compound.

Appendix C provides additional Standard Operating Procedures that the City should follow for spill response at all facilities, including:

- C.3: Spill Response and Cleanup

3.5 Waste Management and Other Applicable Good Housekeeping Practices

Waste from all municipal facilities is collected with the rest of the City's trash by private contractor, Capital Waste.

Building maintenance is conducted to minimize the potential for stormwater pollution. This includes practices such as using tarps and drop cloths when painting or sanding, routinely checking buildings for leaks, and sweeping facility parking lots and driveways.

Appendix C also provides Standard Operating Procedures pertaining to waste management and facility housekeeping, including:

- C.4: Operations and Maintenance of Municipal Buildings and Facilities

There are other Standard Operating Procedures that are applicable to municipal buildings and facilities but are discussed and referenced exclusively in other sections. These include the following:

- SOPs for lawn maintenance and landscaping activities, which are included under Section 2.0, Parks and Open Space
- SOPs for vehicle and equipment storage, washing, and fueling, which are discussed in Section 4.0, Municipal Vehicles and Equipment
- SOPs for street sweeping, snow disposal, and the storage and application of deicing materials, which are discussed exclusively under Section 5.0, Infrastructure Operations and Maintenance

4.0 MUNICIPAL VEHICLES AND EQUIPMENT

4.1 Overview

The DPW is responsible for all the vehicles used by themselves. An inventory of all vehicles operated and maintained by the DPW is included in Appendix A. Vehicles and equipment owned and operated by other municipal departments should be added to the inventory as they are made available.

4.2 Municipal Vehicle Storage, Maintenance, and Repair

Vehicle maintenance facilities have the potential for spills that could contaminate stormwater. Potential pollutants associated with municipal vehicle storage, maintenance, and repair activities include oil and grease, petroleum products, metals, organics and chlorides.

In Revere, most vehicle maintenance is performed within the DPW garage. This maintenance includes changing of fluids. Employees use spigots/funnels and pumps to minimize drips/ leaks, use drip pans when changing fluids, and have absorbing compounds and spill kits available in the event of a spill. The maintenance garage is equipped with floor drains that discharge to an oil-water separator and then to the sanitary sewer system. Spill prevention practices are still encouraged to reduce the amount of oil entering the oil-water separator and the sanitary sewer. Vehicles and equipment are stored inside to the most practicable extent.

4.3 Municipal Vehicle and Equipment Fueling

DPW gasoline and diesel vehicles are fueled on site at the fuel island. Separate diesel and gasoline tanks are located aboveground at the DPW Facility. Both the gasoline and diesel tank are 4,000 gallons. The island is uncovered with a concrete spill pad as secondary containment. Potential stormwater pollutants associated with municipal vehicle and equipment fueling include oil and grease, petroleum products, trash, metals and organics. The fueling area is inspected for signs of spills or leaks, and there is a concrete pad below the fueling station. Spill response procedures are in place.

4.4 Municipal Vehicle Washing

Potential stormwater pollutants associated with municipal vehicle washing include sediment, nutrients, chlorides, trash, metals, oil & grease, petroleum products and organics.

All vehicle washing is conducted inside the DPW building wash bay, which is equipped with an area drain which discharges to the oil-water separator and sanitary sewer.

4.5 Other Applicable Good House Keeping/ Pollution Prevention Practices

Appendix D provides Standard Operating Procedures related to vehicle and equipment operation and maintenance, including:

- D.1: Operations and Maintenance of Municipal Vehicles and Equipment

There are other Standard Operating Procedures that are applicable to Municipal Vehicles and Equipment but are discussed and referenced exclusively in other sections. These include the following:

- SOPs for the use, storage, and disposal of petroleum products; SOPs for spill prevention and response, and SOPs for waste management, which are included under Section 3.0, Municipal Buildings and Facilities
- SOPs for street sweeping, which are discussed exclusively under Section 5.0, Infrastructure Operations and Maintenance

5.0 DRAINAGE INFRASTRUCTURE OPERATIONS AND MAINTENANCE

5.1 Drainage System Overview

Revere has developed a comprehensive map of the City's drainage system in GIS, which includes city-wide mapping of outfalls, culverts, drain manholes, catch basins, drainage pipes, swales, etc. The system consists of approximately:

- 70.5 Miles of Drainage pipe
- 3,266 municipal catch basins,
- 1,119 municipal storm drain manholes,
- 96 municipal outfalls

There are formal collection facilities on most streets in the City. Revere has several outfalls that discharge directly to surface waters, and few that discharge to infiltration or leaching basins which infiltrate stormwater directly into the ground. An inventory of City-owned structural BMPs is included in Appendix A of this plan.

5.2 Catch Basin Cleaning

The Department of Public Works performs routine inspections, cleaning, and maintenance of their 3,266 catch basins that are located within the MS4 regulated area. The City of Revere has been recording catch basin cleaning and inspection data since 2019. The City began recording depth of sediment in 2022, and plans to continue collecting sediment depth data as well as bottom of inlet, and height of sump data. This data will be utilized to identify those catch basins that are filling up more quickly and will therefore need to be cleaned more than once annually to ensure that the "50 Percent" goal, described below, is always reached. A catch basin inspection/cleaning procedure is included in Appendix E. All catch basin cleanings are temporarily stored at the DPW Facility and are disposed of by a contractor.

The City of Revere will implement the following catch basin inspection and cleaning procedures to reduce the discharge of pollutants from the MS4 and to meet anticipated requirements of the new MS4 Permit:

- If a catch basin sump is more than 50 percent full during two consecutive routine inspections or cleaning events, the finding will be documented, the contributing drainage area will be investigated for sources of excessive sediment loading, and to the extent practicable, contributing sources will be addressed. If no contributing sources are found, the inspection and cleaning frequency will be increased.
- Catch basins located near construction activities (roadway construction, residential, commercial, or industrial development or redevelopment) will be inspected and cleaned more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings (i.e., catch basins more than 50 percent full). Priority will also be given to catch basins that discharge to impaired waters.
- The following information will be included in each annual report:
    - Any action taken in response to excessive sediment or debris loadings
    - Total number of catch basins
    - Number of catch basins inspected
    - Number of catch basins cleaned
    - Total volume or mass of material removed from catch basins.

Appendix E provides Standard Operating Procedures that the City should follow, including:

- E.1: Catch Basin Inspection and Cleaning

5.3 Street Sweeping

The City of Revere has 800 centerline miles within the city. All streets and parking lots under municipal jurisdiction are swept every two weeks April through November. A schedule of street sweeping is maintained on the City's website and GIS database. Streets are swept at least once every two weeks, with the busiest streets swept once or multiple times weekly. Cleanings are temporarily stored at the DPW Facility and are disposed of by a contractor.

The City of Revere will implement the following street and parking lot sweeping procedures to reduce the discharge of pollutants from the MS4:

- More frequent sweeping will be considered for targeted areas based on pollutant load reduction potential, inspections, pollutant loads, catch basin cleaning or inspection results, land use, impaired waters, or other factors.
- More frequent sweeping is required for municipally-owned streets and parking lots in areas that discharge to certain nutrient-impaired waters. Sweeping must be performed in these areas a minimum of two times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).
- For limited access highways, the City of Revere will either meet the minimum frequencies above, or develop and implement an inspection, documentation, and targeted sweeping plan outlining reduced frequencies within two (2) year of the effective date of the permit, and submit such plan with its year one annual report.

The following information will be included in each annual report:

  - Number of miles cleaned, or the volume or mass of material removed (see sweeping log in Appendix F).

5.4 Winter Road Maintenance

Potential stormwater pollutants associated with winter road maintenance include chloride, sediment, and various deicing materials. Pollution potential is reduced by properly storing salt and sand, minimizing the use of sodium chloride and other salts, evaluating opportunities for use of alternative materials, and ensuring that snow disposal activities do not result in disposal of snow into waters of the United States.

The City of Revere strictly uses salt during winter road operations. All salt is stored in the salt shed at the DPW Facility at 319 Charger Street. This is where all truck loading and unloading occurs also. If any salt is spilled outside of the shed, it is quickly swept up and moved back inside.

Appendix G provides Standard Operating Procedures for winter road maintenance, including:

- G.1: Salt Use Optimization/ Winter Road Maintenance

There are other Standard Operating Procedures that are applicable to Winter Road Maintenance but are discussed and referenced exclusively in other sections. These include the following:

SOPs for the operation and maintenance of vehicles and equipment, which are discussed exclusively under Section 4.0, Municipal Vehicles and Equipment

5.5 Inspection and Maintenance of Stormwater Treatment Structures

The City annually inspects its stormwater treatment structures, which include detention basins, subsurface infiltration/detention basins, oil/water separators and stormceptors. When properly maintained, these structures reduce stormwater pollution and reduce stormwater facility maintenance costs. A complete inventory of existing stormwater treatment structures is included in Appendix A.

Appendix H provides Standard Operating Procedures for stormwater treatment structures, including:

- H.1: Inspection and Maintenance of Structural Stormwater Best Management Practices (BMPs)

Many stormwater treatment structures are proprietary systems for which the manufacturer provides operation and maintenance procedures. In the event that there are conflicting operation and maintenance procedures for a stormwater treatment structure, any procedure provided by the manufacturer shall take precedent.

APPENDIX A

Parks and Open Space Inventory

Municipal Buildings and Facilities Inventory

Municipal Vehicles and Equipment Inventory

Inventory of City-Owned Stormwater Treatment Structures

Figure 34: Open Space and Recreation Inventory

Name	Owner	Manager	Current Use	Condition	Recreation Potential	Funds Used	Zoning District	Level of Protection	Public Access	Acres
City-Owned Active Recreation										
Costa Park	City of Revere	Parks & Recreation	Recreation: picnic tables, benches, swings, playground equipment	Good	None planned	CDBG, Kaboom	GB	Permanent	Yes	0.2
Della Russo Stadium	City of Revere	Parks & Recreation	Recreation: football stadium with locker rooms, bathrooms, bleachers, track	Excellent	None planned	City	RB	Permanent	Yes	4.4
Gibson Park	City of Revere	Parks & Recreation	Recreation: softball field, benches, tennis courts, basketball courts, playground equipment, picnic table, parking lot	Fair	None planned	LWCF, CDBG	RA1	Permanent	Yes	5.8
Griswold Park	City of Revere	Parks & Recreation	Recreation and conservation: baseball field, softball field, small fenced in tot lot, bleachers, concession stand adjacent to conservation area	Good	Used for active recreation, potential for additional passive recreation such as walking paths	City	RB	Permanent	Yes	12.7
Harmon Park	City of Revere	Parks & Recreation	Recreation: basketball hoops, swings, located adjacent to Northern Strand Community Trail	Fair	None planned	CDBG, PARC	RA1	Permanent	Yes	0.5
Liberty Park	City of Revere	Parks & Recreation	Recreation: tot lot with playground equipment, benches	Good	None planned	Federal grant	RA1	Permanent	Yes	0.5
Louis Pasteur Park	City of Revere	Parks & Recreation	Recreation: playground equipment, basketball court, picnic table	Good	None planned	CDBG, Common Backyard	RB	Permanent	Yes	0.7

Name	Owner	Manager	Current Use	Condition	Recreation Potential	Funds Used	Zoning District	Level of Protection	Public Access	Acres
Neponset Street Park	City of Revere	Parks & Recreation	Recreation: tot lot with playground equipment and benches	Good	None planned	CDBG	RB	Permanent	Yes	0.2
Oak Island/ DeStoop Park	City of Revere	Parks & Recreation	Recreation: fenced in tot lot with playground equipment and benches, softball field, turf soccer field, basketball court	Excellent	None planned	CDBG, UPARR, PARC	RB	Permanent	Yes	2.5
Paws & Play Dog Park	City of Revere	Parks & Recreation	Recreation: fenced in dog park	Excellent	None planned	City	RB	Permanent	Yes	2.6
Pearl Avenue/ Orchard Street Park	City of Revere	Parks & Recreation	Recreation: tot lot with playground equipment and benches	Fair	None planned	Federal grant	GB	Permanent	Yes	0.4
Police Station Basketball Court	City of Revere	Parks & Recreation	Recreation: basketball courts, designated parking	Excellent	None planned	City	RB	Permanent	Yes	0.5
Rose Street Federal Family Development Tot Lot	Revere Housing Authority	Parks & Recreation	Recreation: small tot lot with benches and playground equipment at center of housing development	Good	None planned	Housing Authority	RB	Permanent	Yes	0.2
Sonny Meyers Park	City of Revere	Parks & Recreation	Recreation: tot lot with playground equipment, picnic tables, benches, parking available at Historical Society	Excellent	None planned	CDBG	RB	Permanent	Yes	0.3
State Veteran's Development Basketball Court	Revere Housing Authority	Revere Housing Authority	Recreation: basketball hoops at center of housing development	Good	None planned	Housing Authority	RB	Limited	Yes	0.3
City-Owned School-Based Recreation										

Name	Owner	Manager	Current Use	Condition	Recreation Potential	Funds Used	Zoning District	Level of Protection	Public Access	Acres
Beachmont School/Frederick Park/Repucci Park	City of Revere	Parks & Recreation	Recreation: soccer field, basketball courts, hockey court, tot lot, baseball/softball fields	Good	None planned	City, LWCF, UPARR, Child Safety grant	RB	Permanent	Yes	13.5
Garfield School/ Curtis Park	City of Revere	Parks & Recreation	Recreation: baseball field with bleachers, bicycle parking, basketball court, tot lot	Good	None planned	CDBG	RB	Permanent	Yes	2.8
Hill School Playground	City of Revere	Parks & Recreation	Recreation: fenced in tot lot adjacent to Della Russo Stadium	Excellent	None planned	City	RB	Permanent	Yes	0.1
Lincoln School Park	City of Revere	Parks & Recreation	Recreation: basketball court, playground	Excellent	None planned	City	RB	Permanent	Yes	2.0
McKinley School Playground	City of Revere	Parks & Recreation	Recreation: basketball court	Fair	None planned	City	RB	Permanent	Yes	0.4
Paul Revere School/Consiglia Della Russo Park	City of Revere	Parks & Recreation	Recreation: small tot lot, fenced in blacktop and playground, little league baseball field	Good	None planned	DCS/LWCF	RB	Permanent	Yes	1.8
Revere High School Veteran's Field/Ambrose Park/ Erricola Park	City of Revere	Parks & Recreation	Recreation: artificial turf football field, baseball field, softball field, playground	Good	None planned	UPARR, LWCF, CDBG	RB	Permanent	Yes	11.1
Whelan School/ Ciarlone Tot Lot/ DiSalvo Park	City of Revere	Parks & Recreation	Recreation: fenced in playground, fenced in tot lot, softball fields, basketball court	Excellent	None planned	LWCF, CDBG	RB	Permanent	Yes	3.8
Other City-Owned Open Space										

Name	Owner	Manager	Current Use	Condition	Recreation Potential	Funds Used	Zoning District	Level of Protection	Public Access	Acres
American Legion Park	City of Revere	City of Revere	Recreation and historical: small public plaza with pathways and statues	Good	None planned	City	CB	Limited	Yes	0.7
Beachmont Community Park	City of Revere	Parks & Recreation	Recreation: grassy triangle with benches and landscaped path	Excellent	None planned	City	RB	Permanent	Yes	0.1
Belle Isle Marsh	City of Revere	City of Revere	Conservation: marshland with limited access	Excellent	None planned	Unknown	RB	Limited	Yes	8.39
Destasio/Oxford Street Park	City of Revere	Parks & Recreation	Recreation: grassy strip of land between two roads with path	Fair	None planned	City	RB	Permanent	Yes	0.5
Dunn Road Conservation Land	City of Revere	Conservation Commission	Conservation: vacant land with no facilities	N/A	None	Tax title	RB	Permanent	Yes	0.1
Jacobs Park	City of Revere	Parks & Recreation	Conservation: parcel of land with no facilities	N/A	Potential for passive recreation such as walking paths	Gift to City	RB	Permanent	Yes	5.9
Leverett Avenue/ Edward Leach Park	City of Revere	Parks & Recreation	Recreation and flood control: landscaped area with walking paths	Excellent	None planned	FEMA	RB	Permanent	Yes	0.6
North Revere Conservation Area	City of Revere	Conservation Commission	Conservation: no facilities or signs, trails from previous use as a riding stable	N/A	Potential for passive recreation such as walking paths	Urban Self-Help	RA1	Permanent	Yes	21.3
North Shore Road Conservation Land	City of Revere	Conservation Commission	Conservation: vacant land with no facilities	N/A	None	Tax title	GB	Permanent	Yes	0.1

Name	Owner	Manager	Current Use	Condition	Recreation Potential	Funds Used	Zoning District	Level of Protection	Public Access	Acres
Northern Strand Community Trail	City of Revere	City of Revere	Recreation: regional shared use path for walking and biking	Excellent	None planned	Recreational Trails	TED, HB, RB, RA1, NB	Permanent	Yes	--
Oak Island Marsh	City of Revere	City of Revere	Conservation: area of marshland	N/A	None	Unknown	GB	Permanent	Yes	17.6
Pines River	City of Revere	City of Revere	Recreation: grassy area adjacent to the river	N/A	None planned	Unknown	GB	Limited	Yes	3.7
Pines Road Boat Launch	City of Revere	City of Revere	Recreation: small boat launch	Fair	None planned	City	RA	Permanent	Yes	0.1
Recreation Center	City of Revere	Parks & Recreation	Recreation: building houses the Recreation Department offices and is used for programs, has two full indoor basketball courts	Good	None planned	City	RB	None	Yes	0.2
Revere Society for Cultural and Historic Preservation	City of Revere	Revere Society for Cultural and Historic Preservation	Historical: property is a museum that is open to the public on Saturday afternoons	Fair	None	CDBG, other grants and donations	RB	Permanent	Yes	0.5
Rumney Marsh	City of Revere	City of Revere	Conservation: large marshland area	N/A	None planned	Unknown	TED	Limited	Yes	116.2
Rumney Marsh Burial Ground	City of Revere	Parks & Recreation	Historical: site is a historic burial ground	Good	None	City	RB	Permanent	Yes	0.6
State-Owned Open Space										
Belle Isle Marsh	DCR	DCR	Conservation: marshland with limited access	Excellent	None planned	State	RB	Permanent	Yes	17.8

Name	Owner	Manager	Current Use	Condition	Recreation Potential	Funds Used	Zoning District	Level of Protection	Public Access	Acres
Centennial Park	DCR	DCR	Recreation: small sitting area	Excellent	None planned	State	RB	Permanent	Yes	0.2
Cronin Rink	DCR	Private co.	Recreation: indoor skating rink	Excellent	None planned	State	RB	Permanent	Yes (fee)	5.5
Leverett Avenue Picnic Pavilion	DCR	DCR	Recreation: small picnic pavilion across street from Rocky Beach	Good	None planned	FEMA	RB	Permanent	Yes	0.6
Mill Creek Canoe Launch	DCR	DCR	Recreation: canoe launch, end of parking lot for Cronin Rink	Excellent	None planned	State	RB	Permanent	Yes	0.0
Revere Beach Parkway	DCR	DCR	Recreation: recreational parkway	Good	None	State	N/A	Permanent	Yes	39.5
Revere Beach Reservation	DCR	DCR	Recreation: public beach with bathrooms, pavilions, bandstand, green space	Good	None planned	State	RB	Permanent	Yes	28.0
Rocky Beach	DCR	DCR	Recreation: small beach rocky beach	Fair	None planned	State	RB	Permanent	Yes	0.8
Rumney Marsh	DCR	DCR	Conservation: large marshland area	N/A	None planned	Unknown	TED	Permanent	Yes	140.6
Sea Plane Basin	DCR	DCR	Conservation: area of marshland and open water	N/A	None planned	Unknown	TED	Permanent	Yes	114.7
Short Beach	DCR	DCR	Recreation: small beach at Winthrop border	Fair	None planned	State	RB	Permanent	Yes	0.9

Name	Owner	Manager	Current Use	Condition	Recreation Potential	Funds Used	Zoning District	Level of Protection	Public Access	Acres
Sullivan Field	DCR	DCR	Recreation: softball field	Poor	None planned	State	RB	Permanent	Yes	1.0
Privately-Owned Open Space										
McMackin Field	Revere Little League	Revere Little League	Recreation: private Little League baseball field, abandoned	Poor	None planned	Private	GB	None	Members only	3.0
North Shore Road Boat Launch	Private	Private	Recreation: boat ramp created as part of a Chapter 91 license	Good	None planned	Private	HB	Limited	Yes	0.0
Overlook Ridge Playground	Overlook Ridge	Overlook Ridge	Recreation: large accessible playground with two-story play structure, tennis courts	Excellent	None planned	Private	OROD C	None	Overlook Ridge residents	0.4
Overlook Ridge Stormwater Area	Overlook Ridge	Overlook Ridge	Recreation and flood control: constructed wetland with pond, stone benches, stone dust path	Excellent	None planned	Private	OROD A	Permanent	Yes	6.9
Pines Beach	Point of Pines Assoc.	Point of Pines Assoc.	Recreation: private beach	Good	None planned	Unknown	RA	None	Point of Pines residents	15.6
Slades Mill Canoe Launch	Private	Private	Recreation: boat ramp created as part of a Chapter 91 license	Poor	None planned	Private	TED	Limited	Yes	0.4

Revere, MA
City-Owned Building and Facility Inventory

Facility	Location
City Hall	281 Broadway
Public Library	179 Beach Street
Rossetti-Cowan Senior Center	25 Winthrop Avenue
American Legion Building	249 Broadway
Revere Historical Society	108 Beach Street
McKinley School	65 Yeamans Street
Police Department	400 Revere Beach Parkway
Fire Station #1	360 Revere Beach Parkway
Fire Station #2 (Decommissioned)	Point of Pines
Fire Station #3 (shared with City of Malden)	3 Overlook Ridge Drive
Fire Station #4 (headquarters)	400 Broadway
Fire Station #5	4 Freeman Street
Fire Department storage	929 Winthrop Avenue
DPW Building	321 Rear Charger Street
Recreation Offices	150 Beach Street
A.C. Whelan Elementary School	107 Newhall Street
Abraham Lincoln School	68 Tuckerman Street
Beachmont Veterans Memorial School	15 Everard Street
Garfield Elementary School	176 Garfield Avenue
Garfield Middle School	176 Garfield Avenue
Paul Revere Innovation School	395 Revere Street
Revere High School	101 School Street
Rumney Marsh Academy	140 American Legion Highway
SeaCoast High School	15 Everard Street
Staff Sergeant James J. Hill Elementary School	41-67 Park Avenue
Susan B. Anthony Middle School	107 Newhall Street
Winthrop Avenue Fire Station	931 Winthrop Avenue

City of Revere - DPW Vehicle List

Current Vehicle to remain

Vehicle on DPW List - Not observed. Dimensions estimated

New vehicle scheduled to be purchased

Weston & Sampson ITEM NO.	DPW INVENTORY NO.	VEHICLES & EQUIPMENT DIMENSIONS	DEPARTMENT	MAKE	PLATE #	COMMENT (plow,attach,etc.)
TRUCKS						
Truck 1	2	27'x10'	WATER	Emergency Response Box Truck	M58092	
Truck 2	3	19'x9'	DPW	Ford Econo E-350 Van	M74157	
Truck 3	4	20'x10'	SIGN	Ford E-350	M74166	
Truck 4	11	24'x12'	DPW	International Dump Truck	M73680	Large Plow 12'x7'
Truck 5	12	24'x10'	DPW	Ford Truck	M58253	
Truck 6	16	26'x10'	DPW	Ford Truck	M74171	
Truck 7	17	24'x10'*	DPW	Ford F-550 Dump	M74158	
Truck 8	25	26'x10'	DPW	Ford Chassis Cab Pickup	M68094	
Truck 9	28	19'x9'*	DPW	Ford E250 Van	M74162	
Truck 10	32	27'x10'	DPW	Ford Truck	M58255	
Truck 11	37	19'x8'	DPW	Chevy Express	M68084	
Truck 12	38	26'x10'	DPW	International Truck	M68928	Large Plow 12'x7'
Truck 13	39	22'x10'	DPW	International Truck	M69677	Large Plow 12'x7'
Truck 14	40	22'x10'	DPW	International Truck	M72122	Large Plow 12'x7'
Truck 15	41	26'x10'	DPW	Ford F350 Pickup	M33529	
Truck 16	42	19'x8'	DPW	Ford F250	M36959	
Truck 17	43	33'x11'	DPW	International 7400	M65362	Large Plow 12'x7'
Truck 18	45	19'x9'*	DPW	Ford Pickup	M74170	

* Vehicle Dimension Estimated

Weston & Sampson ITEM NO.	DPW INVENTORY NO.	VEHICLES & EQUIPMENT DIMENSIONS	DEPARTMENT	MAKE	PLATE #	COMMENT (plow,attach,etc.)
Truck 19	51	24'x12'	DPW	International Dump Truck	M72121	Large Plow 12'x7'
Truck 20	S-1	19'x9'	DPW	Ford Pickup	M74169	
Truck 21	S-2	23'x10'	DPW	Ford Pickup	M74168	
Truck 22	S-3	23'x10'	DPW	Ford Pickup	M74167	
Truck 23	S-5	19'x9'	DPW	Ford Pickup	M55505	
Truck 24	S-6	19'x9'*	DPW	Ford Pickup	M55506	
Truck 25	S-7	19'x9'	DPW	Ford F250 Pickup	M83767	
Truck 26	G-1	22'x9'	DPW	Ford Pickup	M74163	
Truck 27		33'x11'*	DPW	International 4300 SBA		NEW
Truck 28		24'x10'*	DPW	Chevy 2500 Double Cab		NEW
Truck 29		24'x10'*	DPW	Chevy 2500 4x4 Silverado Pickup		NEW
Truck 30		28'x10'*	DPW	Chevy Highway Chip Dump		NEW
Truck 31		24'x10'*	DPW	Chevy 3500		NEW
Truck 32		24'x10'*	DPW	Chevy 3500		NEW
Truck 33		24'x10'*	DPW	Chevy 2500 Crew Cab		NEW
Truck 34		24'x10'*	DPW	Chevy 2500 Crew Cab		NEW
Truck 35		28'x10'*	DPW	International 4300 SBA		NEW
Truck 36		28'x10'*	DPW	International 4300 SBA		NEW
Truck 37		28'x10'*	DPW	International 4300 SBA		NEW
Truck 38		28'x10'*	DPW	International 4300 SBA		NEW
TRAILERS						
T1	47	12'x6'	DPW	Ingersol Trailer	M72114	
T2	50	20'x10'	DPW	American Utility Trailer	M72120	
T3	68	14'x8'*	DPW	Carmate Trailer	M3058	
T4	72	36'x10'	DPW	Cross Country Flatbed Trailer	M76404	

* Vehicle Dimension Estimated

Weston & Sampson ITEM NO.	DPW INVENTORY NO.	VEHICLES & EQUIPMENT DIMENSIONS	DEPARTMENT	MAKE	PLATE #	COMMENT (plow,attach,etc.)
EQUIPMENT						
EQ1	13	17'x8'	DPW	Kubota Excavator	M79742	
EQ2	15	25'x12'	DPW	Volvo Loader	M72108	
EQ3	23	19'x9'	DPW	Elgin Sweeper	M68931	
EQ4	31	25'x8'	DPW	Cat Backhoe	M68080	
EQ5	34	25'x9'	DPW	John Deere Backhoe	M52686	
EQ6	35	14'x8'	DPW	Ston Roller		
EQ7	44	23'x8'	DPW	Case Tractor	M80539	
EQ8	65	14'x6'	DPW	Bobcat Skid Steer	M63232	
EQ9	66	14'x6'	DPW	Bobcat Skid Steer	M63233	
EQ10	69	16'x8'	DPW	Carlton Chipper	M68932	
EQ11	73	6'x8'	DPW	Cement Mixer	M46333	

* Vehicle Dimension Estimated

Inventory of Structural Stormwater Best Management Practices (BMPs)
Revere, Massachusetts

Facility ID	Location	BMP Type	Inspection Frequency	Date of Last Inspection	Comments
ODBA00143	400 Revere Beach Parkway	Detention Pond	Annually		
ODBA00144	400 Revere Beach Parkway	Detention Pond	Annually		
ODBA00145	360 Revere Beach Parkway	Detention Pond	Annually		
DIS01654	Hyde Street Place	Dry Well	Annually		
DTS02296	Dunn Road	Oil & Water Separator	Annually		
DTS04097	Furlong Drive	Oil & Water Separator	Annually		
DTS07227	Pearl Avenue	Oil & Water Separator	Annually		
DTS07228	Pearl Avenue	Oil & Water Separator	Annually		
DTS07223	Dolphin Avenue / Wave Avenue	Settling Tank	Annually		Settling tank found in field
DTS06196	Rumney Marsh Academy	Stormceptor	Annually		
DTS06198	Rumney Marsh Academy	Stormceptor	Annually		
DTS06287	Rumney Marsh Academy	Stormceptor	Annually		
DTS06309	Rumney Marsh Academy	Stormceptor	Annually		
DTS06320	Rumney Marsh Academy	Stormceptor	Annually		
DTS06324	Rumney Marsh Academy	Stormceptor	Annually		
DTS06329	Rumney Marsh Academy	Stormceptor	Annually		
DTS07554	Police and Fire HQ	Stormceptor	Annually		
DTS07570	Police and Fire HQ	Stormceptor	Annually		
DTS07691	Park Ave / Hill School	Stormceptor	Annually		
DTS07708	Fernwood Ave / Hill School	Stormceptor	Annually		
ODBA00154	51 Park Avenue	Subsurface Detention Basin	Annually		178 LF of 36" Solid Watertight CPP with 36" CPP Headers embedded in crushed stone
ODBA00153	51 Park Avenue	Subsurface Detention Basin	Annually		2927 LF of 36" Solid Watertight CPP with 36" CPP Headers embedded in crushed stone
DBA00004	18 Bellevue Avenue	Subsurface Infiltration Basin	Annually		3 Rows of 7 Cultec 330XL Subsurface Recharger Units
DBA00003	500 Ocean Avenue	Subsurface Infiltration Basin	Annually		45 Stormtech SC-310 Infiltration Chambers
DST07221	Atlantic Avenue / Jones Road	Other Structure	Annually		Material Change - See pipe notes on either side - observed in CCTV
DST07224	Della Russo Stadium	Other Structure	Annually		Unknown structure type, not clear from plan, part of field drainage
DST07225	Della Russo Stadium	Other Structure	Annually		Unknown structure type, not clear from plan, part of field drainage
DST07226	Della Russo Stadium	Other Structure	Annually		Unknown structure type, not clear from plan, part of field drainage
ODBA00085	770 Washington Avenue	Subsurface Infiltration Basin	Annually		Could be privately owned. 5 rows of 8 Cultec 280HD Rechargers (40 total)
ODBA00147	540 Revere Beach Boulevard	Underground Treatment Tank	Annually		Could be privately owned.
ODBA00086	36-40 Furlong Drive	Detention Pond	Annually		Could be privately owned
ODBA00087	36-40 Furlong Drive	Detention Pond	Annually		Could be privately owned
ODBA00088	36-40 Furlong Drive	Detention Pond	Annually		Could be privately owned
ODBA00089	36-40 Furlong Drive	Detention Pond	Annually		Could be privately owned
ODBA00118	Across from 3 Overlook Ridge Drive	Detention Pond	Annually		Could be privately owned
ODBA00119	Across from 3 Overlook Ridge Drive	Detention Pond	Annually		Could be privately owned

APPENDIX B

Standard Operating Procedure – Parks and Open Space

B.1: Parks and Open Space Management

SOP: Operations and Maintenance of Parks and Open Spaces

Introduction

Parks and open space operations and maintenance activities commonly involve the operation of equipment such as mowers and tractors; disposal of waste from mowing, planting, weeding, raking, pruning, and trash collection; application of pesticides, herbicides, and fertilizers; cleaning and maintenance of park amenities such as play equipment, restrooms, and structures; and snow removal. These activities have the potential to generate contaminants such as sediments and toxic chemicals that may be picked up by rainwater, thereby entering the storm drainage system and receiving waters. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees to reduce the discharge of pollutants from the MS4 and to receiving waters as a result of parks and open space operations and maintenance. If services are contracted, this SOP should be provided to the contractor. The contract should specify that the contractor is responsible for compliance with all applicable laws.

The City of Revere performs a variety of operations and maintenance activities at its municipal parks and open spaces. Current parks and open spaces operations and maintenance activities (i.e., use and storage of fertilizers/pesticides/herbicides, mowing and weeding practices, pet waste collection) are attached in Appendix B – Parks and Open Spaces, of this SOP.

Procedures

Revere will implement the following procedures at municipal parks and open spaces to reduce the discharge of pollutants from the MS4:

General

- Repair damage to landscaped or mulch or vegetated bare areas as soon as possible to prevent erosion. If there are areas of erosion or poor vegetation, repair them as soon as possible, especially if they are within 50 feet of a surface water (e.g., pond, lake, or river).
- Remove (sweep or shovel) materials such as soil, mulch, and grass clippings from parking lots, streets, curbs, gutters, sidewalks, and drainage-ways.
- Do not clean up any unidentified or possibly hazardous materials found during maintenance; notify a supervisor immediately.

Maintenance

- Wastewater from power washing signs, structures, or bleachers cannot be discharged into the stormwater system.
- When painting park equipment, use a drop cloth and clean up any spills immediately.
- Do not leave open containers on the ground where they may accidentally tip over.
- Sweep parking lots with a street sweeper and dispose of street sweepings in designated areas
- Never wash debris from parking lots into the storm drain.

Mowing

- Remove debris and trash from landscaped areas prior to mowing.
- Collect grass clippings and leaves after mowing. Do not blow or wash them into the street, gutter, or storm drains.
- Properly recycle or dispose of organic waste after mowing, weeding, and trimming.
- Reduce mowing frequencies wherever possible by establishing low/no-mow areas in lesser-used spaces.
- Brush off mowers (reels and decks) and tractors over grassy areas or in contained washout areas.
- Leave clippings on grassy areas or dispose of them in the trash or by composting.
- Do not hose off mowers over paved areas that drain into the MS4 or directly to surface waters.
- Follow proper vehicle and equipment maintenance procedures to prevent leaks (see SOP 21: Operations and Maintenance of Municipal Vehicles and Equipment)
- Do not allow grease from mowers to fall onto areas where they can be washed into the stormwater system.

Irrigation

- Repair broken sprinkler heads as soon as possible.
- Only irrigate at a rate that can infiltrate into the soil to limit run-off.
- Avoid irrigating close to impervious surfaces such as parking lots and sidewalks.

Landscaping

- When establishing new plantings, use alternative landscaping materials, such as drought resistant or native plants to reduce the need for irrigation and extensive application of fertilizers and pesticides.
- Follow proper fueling procedures for all equipment to ensure that petroleum products do not enter the stormwater system (see SOP 7: Fuel and Oil Handling Procedures).
- Fertilizers, herbicides, and pesticides should be properly used, stored, and handled (see SOP 12: Storage and Use of Pesticides and Fertilizer).

Snow Removal

- Any damage done to vegetated areas caused by plows or deicing materials should be repaired as early as possible in the spring.

Trash Management

- All waste and recycling containers must be leak-tight with tight-fitting lids or covers.
- Place waste and recycling containers indoors or under a roof or overhang whenever possible.

- Clean and sweep up around outdoor waste containers regularly.
- Arrange for waste and recyclables to be picked up regularly and disposed of at approved disposal facilities.
- Do not wash out waste or recycling containers outdoors or in a parking lot.
- Conduct periodic inspections of waste areas to check for leaks and spills.
- Ensure there are enough trash and recycling containers at appropriate areas.

Other Activities

- Provide pet waste stations with bags and trash receptacles where pets are permitted. Post signs describing the proper disposal of pet waste.
- All portable toilets should be staked down in flat, secure locations where they are less likely to be knocked down or blown over. They should be placed in a location that would retain any spillage from washing into the MS4 or receiving waters. Ensure routine maintenance and cleaning of portable toilets.
- Identify undesirable waterfowl congregation areas and take steps to prevent waterfowl droppings from entering the stormwater system or surrounding waterbodies.
    - Take measures to discourage congregation near waterbodies and the storm system (e.g., use strobe lights or reflective tape, establish no-mow zones to reduce available feeding areas, or plant thick vegetation along waterlines). If waterfowl congregation cannot be managed, then isolate the drainage from congregation areas away from the storm system and waterbodies.

Install signage to educate the public on the negative effects of waterfowl feces entering the stormwater system or nearby waterbodies in order to discourage public feeding. Alternatively, enact feeding bans.

Employee Training

- Employees who perform maintenance or other applicable work at municipal parks and open spaces are trained once per year on these procedures and the proper operation of related equipment.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

APPENDIX C

Standard Operating Procedures – Municipal Buildings and Facilities

C.1 Fuel and Oil Handling

C.2 Hazardous Materials Storage and Handling

C.3 Spill Response

C.4 Operation and Maintenance of Buildings and Facilities

C.1: Fuel and Oil Handling

Introduction

Spills, leaks, and overfilling can occur during handling of fuels and petroleum-based materials, representing a potential source of stormwater pollution, even in small volumes. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees on a variety of ways by which fuels and petroleum-based materials can be delivered, as well as steps to be taken when petroleum products (such as waste oil) are loaded onto vehicles for offsite disposal or recycling. Delivery, unloading, and loading of waste oils are hereafter referred to as "handling." Attached is a fuel delivery form checklist.

The City of Revere undertakes various procedures and precautions in handling fuel and oil, as described in Section 3.0 of the City's Operation and Maintenance Plan.

Procedures

The City of Revere will implement the following fuel and oil handling procedures to help reduce the discharge of pollutants from the MS4:

General Guidelines

For all manners of fuel and oil handling described below, a member of the facility's Pollution Prevention Team (if the facility has a SWPPP) or another knowledgeable person familiar with the facility should be present during handling procedures. This person should ensure that the following are observed:

- There is no smoking while fuel handling is in process or underway.
- Sources of flame are kept away while fuel handling is being completed. This includes smoking, lighting matches, carrying any flame, or carrying a lighted cigar, pipe, or cigarette.
- The delivery vehicle's hand brake is set, and wheels are chocked while the activity is being completed.
- Catch basins and drain manholes are adequately protected.
- No tools are to be used that could damage fuel or oil containers or the delivery vehicle.
- No flammable liquid should be unloaded from any motor vehicle while the engine is operating unless the engine of the motor vehicle is required to be used for the operation of a pump.
- Ensure that local traffic does not interfere with fuel transfer operations. If it does, make appropriate accommodations.
- The attending persons should watch for any leaks or spills:
    - Any small leaks or spills should be immediately stopped, and spilled materials absorbed and disposed of properly. Follow the procedures in SOP C.3: Spill Response and Cleanup.
    - In the event of a large spill or one that discharges to surface waters or an engineered storm drain system, the facility representative should activate the facility's Stormwater Pollution Prevention Plan (SWPPP) and report the incident as specified in the document.

Delivery by Bulk (Tanker) Truck

Procedures for the delivery of bulk fuel should include the following:

- The truck driver should check in with the facility upon arrival.

- The facility representative should ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible. Refer to SOP C.3: Spill Response and Cleanup for examples of spill cleanup and response materials.
- The facility representative should check to ensure that the amount of delivery does not exceed the available capacity of the tank.
    - A level gauge can be used to verify the level in the tank.
    - If a level gauge is not functioning or is not present on the tank, the tank should be stick tested prior to filling.
- The truck driver and the facility representative should both remain with the vehicle during the delivery process.
- The truck driver and the facility representative should inspect all visible lines, connections, and valves for leaks.
- When delivery is complete and the hoses are removed, buckets should be placed underneath connection points to catch drippings.
- The delivery vehicle should be inspected prior to departure to ensure that the hose is disconnected from the tank.
- The facility representative should inspect the fuel tank to verify that no leaks have occurred, or that any leaked or spilled material has been cleaned and disposed of properly.
- The facility representative should gauge tank levels to ensure that the proper amount of fuel is delivered and collect a receipt from the truck driver.

Delivery of Drummed Materials

Drummed materials may include motor oil, hydraulic fluid, transmission fluid, or waste oil from another facility (as approved). Procedures for the delivery of drummed materials should include the following:

- The truck driver should check in with the facility upon arrival.
- The facility representative should ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible Refer to SOP C.3: Spill Response and Cleanup for examples of spill cleanup and response materials. The facility representative should closely examine the shipment for damaged drums.
    - If damaged drums are found, they should be closely inspected for leaks or punctures.
    - Breached drums should be removed to a dry, well-ventilated area and the contents transferred to other suitable containers.
    - Drums should be disposed of in accordance with all applicable regulations.
- Drummed materials should not be unloaded outdoors during wet weather events.
- The truck driver and the facility representative should both remain with the vehicle during the delivery process.
- Drums should be handled and unloaded carefully to prevent damage.
- Upon completion of unloading, the facility representative should inspect the unloading point and the drums to verify that no leaks have occurred, that any leaked or spilled material has been cleaned up and disposed of properly, and that the unloaded drums are not leaking.
- The facility representative should check to ensure that the proper amount of fuel or other material is delivered and collect a receipt from the truck driver.

Removal of Waste Oil from the Facility

When waste oil or similar oil products need to be removed from the premises, only haulers certified to transport waste oil should be utilized. Procedures should include the following:

- The disposal truck driver should check in with the facility upon arrival.
- The facility representative should ensure that the appropriate spill cleanup and response equipment and personal protective equipment are readily available and easily accessible. Refer to SOP C.3: Spill Response and Cleanup for examples of spill cleanup and response materials. The truck driver and the facility representative should both remain with the vehicle during the tank draining process.
- When draining is complete and the hoses are removed, buckets should be placed underneath connection points to catch drippings.
- The facility representative should inspect the loading point and the tank to verify that no leaks have occurred, or that any leaked or spilled material has been cleaned up and disposed of properly.
- The facility representative should collect a receipt from the truck driver.
- When draining bulk oil tanks:
    - The facility representative should verify that the volume of waste oil in the tank does not exceed the available capacity of the disposal hauler's vehicle.
    - The disposal hauler vehicle should be inspected prior to departure to ensure that the hose is disconnected from the tank.

Employee Training

- Employees who handle or deliver fuel and/or oil are trained once per year on proper procedures.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Attachments

1. Fuel Delivery Checklist

Related Standard Operating Procedures

- C.3: Spill Response and Cleanup

FUEL DELIVERY FORM

CITY OF REVERE

Date: _____

Time of Arrival: _____

Time of Departure: _____

Truck Number: _____

Name of Truck Driver: _____

Name of Town Employee: _____

BEFORE UNLOADING:

Is all spill response equipment and personal protective equipment in place?

Yes ☐ **No** ☐

In the case of bulk fuel delivery, does tank capacity exceed the amount of delivery?

Yes ☐ **No** ☐ **N/A** ☐

In the case of drum fuel delivery, are all drums free of leaks and punctures?

Yes ☐ **No** ☐ **N/A** ☐

COMMENCE UNLOADING. REMAIN WITH VEHICLE AT ALL TIMES.

AFTER UNLOADING IS COMPLETE:

Have all fuel containers, including the vehicle, been inspected for leaks?

Yes ☐ **No** ☐

Has the ground at the unloading point been inspected for evidence of leaks?

Yes ☐ **No** ☐

If there are any leaks or spills, has the material been properly cleaned?

Yes ☐ **No** ☐

Has the correct amount of fuel been delivered?

Yes ☐ **No** ☐

Has a receipt been collected?

Yes ☐ **No** ☐

DELIVERY IS COMPLETE.

C.2: Hazardous Materials Storage and Handling

Introduction

A hazardous material is any biological, chemical, or physical material with properties that make it dangerous or potentially harmful to human health or the environment. Hazardous materials can be released to the environment in a variety of ways. When hazardous materials come into contact with rain or snow, the pollutants are washed into the storm sewer system and to surface waterbodies and/or groundwater. Hazardous materials associated with municipal facilities and their operations include, but are not limited to, oil, gasoline, antifreeze, fertilizers, pesticides, and de-icing agents and additives.

Municipally owned or managed facilities where hazardous materials are commonly stores and handled include:

- Equipment storage and maintenance yards
- Hazardous waste disposal facilities
- Hazardous waste handling and transfer facilities
- Composting facilities
- Materials storage yards
- Municipal buildings and facilities (e.g., schools, libraries, police and fire departments, City offices, municipal pools, and parking garages)
- Public works yards
- Solid waste handling and transfer facilities
- Vehicle storage and maintenance yards
- Water and wastewater facilities

Minimizing or eliminating contact of hazardous materials with stormwater can significantly reduce pollution of receiving waters. Proper hazardous material handling and storage also contributes to employee health, an organized workplace, and efficient operations. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees to help prevent stormwater pollution resulting from the handling and storage of hazardous materials. If services are contracted, this SOP should be provided to the contractor. The contract should also specify that the contractor is responsible for compliance with all applicable laws.

The City of Revere undertakes various activities regarding handling and storing hazardous materials. These activities are outlined in Section 3 of the City's Operation and Maintenance Plan.

Procedures

The City of Revere will implement the following procedures for handling and storing hazardous materials to reduce the discharge of pollutants to the MS4:

Handling, Loading, and Unloading

- Avoid loading/unloading materials in the rain and/or provide cover.
- Retrace areas where materials have been transferred to identify spills. If spills are found, immediately

clean them up. Follow procedures in SOP C.3: Spill Response and Cleanup.

- Time delivery and handling of materials during favorable weather conditions whenever possible (e.g., avoid receiving loads of sand during windy weather).
- Inspect containers for material compatibility and structural integrity prior to loading/unloading any raw or waste materials.
- Use dry cleanup methods (e.g., squeegee and dust pan, sweeping, and absorbents as last step) rather than hosing down surfaces.

Material Storage

- Confine material storage indoors whenever possible. Plug or disconnect floor drains that lead to the stormwater system.
- Confine outdoor material storage to designated areas that are covered, on impervious surfaces, away from high traffic areas, and outside of drainage pathways.
- Store containers on pallets or equivalent structures to facilitate leak inspection and to prevent contact with wet floors that can cause corrosion. This technique also reduces incidences of container damage by insects and rodents.
- Store materials and waste in materially compatible containment units.
- Keep hazardous materials in their original containers.
- If materials are not in their original containers, clearly label all storage containers with the name of the chemical, the expiration date, and handling instructions.
- Maintain an inventory of all raw and waste materials to identify leakage. Order new materials only when needed.
- Provide secondary containment for storage tanks and drums with sufficient volume to store 110 percent of the volume of the material.
- Provide sufficient aisle space to allow for routine inspections and access for spill cleanup.
- Inspect storage areas for spills or leaks and containment units for corrosion or other failures.

Waste Treatment, Disposal, and Cleanup

- Adopt a regular schedule for the pick-up and disposal of waste materials.
- Recycle leftover materials whenever possible.
- Substitute nonhazardous or less-hazardous materials for hazardous materials whenever possible.
- Protect empty containers from exposure to stormwater and dispose of them regularly to avoid contamination from container residues.

Employee Training

- Employees who handle and use hazardous materials are trained once per year on these procedures.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

C.3: Spill Response and Cleanup

Introduction

Municipalities are responsible for any contaminant spill or release that occurs on property that they own or operate. Particular areas of concern include any facilities that use or store chemicals, fuel oil, or hazardous waste, including schools, garages, and landfills. Implementation of proper spill response and cleanup procedures can help to mitigate the effects of a contaminant release. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees to help reduce the discharge of pollutants from the MS4 as a result of spills or releases.

Procedures

The City of Revere will implement the following spill response and cleanup procedures to reduce the discharge of pollutants from the MS4:

Responding to a Spill

Employees should be trained in proper spill response specific to the materials used at their site and appropriate personal protective equipment (PPE). In the event of a spill, follow these spill response and cleanup procedures:

- If the facility has a Stormwater Pollution Prevention Plan (SWPPP), notify a member of the facility's Pollution Prevention Team, the facility supervisor, and/or the facility safety officer (fill out the attached spill response contact list). If not, continue to follow the procedures outlined below.
- Assess the contaminant release site for potential safety issues and for direction of flow.
- Complete the following:
    - Stop the contaminant release.
    - Contain the contaminant release through the use of spill containment berms or absorbents.
    - Protect all drains and/or catch basins with the use of absorbents, booms, berms or drain covers.
    - Clean up the spill.
    - Dispose of all contaminated products in accordance with applicable federal, state and local regulations.
        i. Soil contaminated with petroleum should be handled and disposed of as described in MassDEP policy WCS-94-400, Interim Remediation Waste Management Policy for Petroleum Contaminated Soils (https://www.mass.gov/files/documents/2016/08/mq/94-400.pdf).
        ii. Products saturated with petroleum products or other hazardous chemicals require special handling and disposal by licensed transporters. Licensed transporters will pick up spill contaminated materials for recycling or disposal. Save the shipping records for at least three years.
        iii. Waste oil contaminated industrial wipes and sorptive minerals:
            1. Perform the "one drop" test to ensure absorbents do not contain enough oil to be considered hazardous, as described in the MassDEP Waste Oil Management Guide (https://www.mass.gov/files/documents/2018/12/18/oilwiper.pdf).
            2. Wring absorbents through a paint filter. If doing so does not generate one

drop of oil, the materials are not hazardous.

3. If absorbents pass the "one drop" test they may be discarded in the trash unless contaminated with another hazardous waste.
    a. It is acceptable to mix the following fluids and handle them as waste oil:
        i. Waste motor oil
        ii. Hydraulic fluid
        iii. Power steering fluid
        iv. Transmission fluid
        v. Brake fluid
        vi. Gear oil
    b. **Do not mix** the following materials with waste oil. Store each separately:
        i. Gasoline
        ii. Antifreeze
        iii. Brake and carburetor cleaners
        iv. Cleaning solvents
        v. Other hazardous wastes
4. If absorbents do not pass the "one drop" test they should be placed in separate metal containers with tight fitting lids, labeled "Oily Waste Absorbents Only."

- If you need assistance containing and/or cleaning up the spill, or preventing it from discharging to a surface water (or an engineered storm drain system), contact your local fire department using the number listed below. **In the case of an emergency call 911**.
    - Revere Fire Department: (781)-286-0014
- Contact the MassDEP 24-hour spill reporting notification line, toll-free at **(888)-304-1133**;
    - The following scenarios **are exempt** from MassDEP reporting requirements (see the MassDEP factsheet on oil and hazardous materials handling for more information: https://www.mass.gov/files/documents/2016/08/xm/spillmgm.pdf).
        i. Spills that are less than 10 gallons of petroleum and do not impact a water body
        ii. Spills that are less than one pound of hazardous chemicals and do not present an imminent health or safety hazard
        iii. Fuel spills from passenger vehicle accidents
        iv. Spills within a vault or building with a watertight floor and walls that completely contain all released chemicals

Reporting a Spill

When contacting emergency response personnel or a regulatory agency, or when reporting the contaminant release, be prepared to provide the following information:

1. Your name and the phone number you are calling from.
2. The exact address and location of the contaminant release.
3. Specifics of release, including:
    a. What was released;
    b. How much was released, which may include:
        i. Pounds

   ii. Gallons
   iii. Number of containers
4. Where was the release sent/what was contaminated, addressing:
   a. Pavement
   b. Soil
   c. Drains
   d. Catch basins
   e. Water bodies
   f. Public streets
   g. Public sidewalks
5. The concentration of the released contaminant.
6. What/who caused the release.
7. Is the release being contained and/or cleaned up or is the response complete.
8. Type and amount of petroleum stored on site, if any.
9. Characteristics of contaminant container, including:
   a. Tanks
   b. Pipes
   c. Valves

Maintenance and Prevention Guidance

Prevention of spills is preferable to even the best response and cleanup. To mitigate the effects of a contaminant release, provide proper maintenance and inspection at each facility. To protect against contaminant release adhere to the following guidance:

- Ensure all employees are properly trained to respond in the case of a spill, understand the nature and properties of the contaminant, and understand the spill control materials and personnel safety equipment. Maintain training records of current personnel on site and retain training records of former personnel for at least three years from the date last worked at the facility.
- Provide yearly maintenance and inspection at all municipal facilities, paying particular attention to underground storage tanks. Maintain maintenance and inspection records on site.
- Implement good management practices where chemicals and hazardous wastes are stored:
  a. Ensure storage in closed containers inside a building and on an impervious surface wherever possible.
  b. If storage cannot be provided inside, ensure secondary containment for 110 percent of the maximum volume of the storage container.
  c. Locate storage areas near maintenance areas to decrease the distance required for transfer.
  d. Provide accurate labels, Material Safety Data Sheets (MSDS) information, and warnings for all stored materials.
  e. Regularly inspect storage areas for leaks.
  f. Ensure secure storage locations, preventing access by untrained or unauthorized persons.
  g. Maintain accurate records of stored materials.
- Replace traditional hazardous materials such as pesticides and cleansers with non-hazardous products such as bio-lubricants which can reduce response costs in the case of a spill.

Maintain appropriately stocked spill response kits at each facilities and locations where oil, chemicals, or other hazardous materials are handled and stored.

Employee Training

- Employees who perform work with potential stormwater pollutants are trained once per year on proper spill procedures.
- Employees are also trained on stormwater pollution prevention and illicit discharge detection and elimination (IDDE) procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Attachments

1. Spill Response and Cleanup Contact List

Spill Response and Cleanup Contact List

Contact	Phone Number	Date and Time Contacted
Public Works Superintendent: Paul Argenzio	**(781) 286-8149**	
Fire Department: Christopher P. Bright , Fire Chief	**(781) 286-8366**	
MassDEP 24-Hour Spill Reporting	**(888) 304-1133**	
MassDEP Regional Offices:		
Northeast Regional Office	**(978) 694-3200**	
Southeast Regional Office	**(508) 946-2700**	
Central Regional Office	**(508) 792-7650**	
Western Regional Office	**(413) 784-1100**	
Hazardous Waste Compliance Assistance Line	**(617) 292-5898**	
Household Hazardous Products Hotline	**(800) 343-3420**	
Massachusetts Department of Fire Services	**(978) 567-3100 or (413) 587-3181**	
Licensed Site Professionals Association (Wakefield, MA) Licensed Site Professionals Board	**(781) 876-8915** **(617) 556-1091**	

C.4: Operations and Maintenance of Municipal Buildings and Facilities

Introduction

Municipal buildings and facilities (schools, municipal offices, police and fire stations, municipal pools, parking garages, etc.) often house various chemicals, such as petroleum products and hazardous materials. As a result, these buildings and facilities are potential sources of pollutant discharges to the storm drainage system. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees on the use, storage, and disposal of chemicals and other stormwater pollutants to reduce the discharge of pollutants from the MS4. If services are contracted, this SOP should be provided to the contractor. The contract should specify that the contractor is responsible for compliance with all applicable laws.

The City of Revere performs a variety of operations and maintenance activities at its municipally owned and operated buildings, as mentioned in the Operation and Maintenance Plan. An inventory of all municipal buildings and facilities is included in Appendix A and will be updated annually.

Procedures

The City of Revere will implement the following procedures for municipally owned or operated buildings and facilities to reduce the discharge of pollutants from the MS4:

Handling, Storage, Transfer, and Disposal of Trash and Recyclables

All liquid and solid waste must be disposed of properly. Some of the most common sources of pollution at municipal facilities are a result of littering, improper collection of debris, and improper disposal of solid or liquid waste.

- All waste and recycling receptacles must be leak-tight with tight-fitting lids or covers.
- Always keep lids on dumpsters and containers closed unless adding or removing material. If using an open-top roll-off dumpster, cover it and tie it down with a tarp unless adding materials.
- Place waste or recycling receptacles indoors or under a roof or overhang whenever possible.
- Locate dumpsters on a flat, paved surface and install berms or curbs around the storage area to prevent run-on and run-off.
- Do not locate dumpsters over or adjacent to catch basins.
- Prior to transporting waste, trash, or recycling, ensure that containers are not leaking (double bag if needed) and properly secure containers to the vehicle.
- Clean and sweep up around outdoor waste containers regularly.
- Clean up any liquid leaks or spills with dry cleanup methods.
- Arrange for waste or recycling to be picked up regularly and disposed of at approved disposal facilities.
- Never place hazardous materials, liquids, or liquid-containing wastes in a dumpster or recycling or trash container (see SOP C.2: Hazardous Materials Storage and Handling).
- Do not wash trash or recycling containers outdoors or in parking lots.
- Conduct periodic inspections of solid and liquid waste storage areas to check for leaks and spills.

- Conduct periodic inspections of work areas to ensure that all wastes are being disposed of properly.
- In dumpster areas, regularly pick up surrounding trash and debris and regularly sweep the area.
- In compactor areas, regularly check the hydraulic fluid hoses and reservoir to ensure that there are no cracks or leaks. Regularly sweep the area.

Building Maintenance

- When power washing buildings and facilities, ensure that the washwater does not flow into the storm system. Containment or filtering systems should be provided.
- Paint and other chemicals should not be applied on the outside of buildings when it is raining or prior to expected rain.
- When sanding, painting, power washing, etc., ensure that sites are properly prepared (e.g., use tarps) and cleaned (e.g., use dry cleaning methods) especially if they are near storm drains. Protect catch basins when maintenance work is conducted upgradient of them.
- When painting, use a drop cloth and clean up any spills immediately.
- Do not leave open containers on the ground where they may accidentally tip over.
- Buildings should be routinely inspected for areas of potential leaks.
- Do not discharge chlorinated pool water into the stormwater system. Water must be properly dechlorinated and tested before it is discharged.
- Streets and parking lots surrounding municipal buildings and facilities should be swept and kept clean to reduce runoff of pollutants and debris to the stormwater system.
- Streets and parking lots around buildings and facilities will be swept in accordance with the procedures in SOP F.1: Streets and Parking Lots.

Storage of Petroleum Products and Potential Pollutants

- Floor drains in storage areas should be disconnected from the stormwater system.
- Routinely inspect buildings and facilities for areas of potential leaks.
- For storage and handling procedures of petroleum products and potential pollutants, refer to SOP C.2: Hazardous Materials Storage and Handling and SOP C.1: Fuel and Oil Handling Procedures.
- Should the City begin to store and apply fertilizer, herbicides, or pesticides, a separate SOP shall be developed for all activities relevant to those potential pollutants.
- All municipal buildings and facilities should be periodically inspected to address potential pollutant sources (e.g., leaks).

Spill Prevention Plan

- Spill prevention plans such as Spill Prevention Control and Countermeasure (SPCC) Plans should be in place where applicable, based on inventories of material storage and potential pollutants. Coordinate with the local fire department if necessary.
- Spill SOPs are outlined in SOP C.3: Spill Response and Cleanup.

Employee Training

- Employees who perform maintenance or other applicable work at municipal buildings and facilities are trained once per year on these procedures and the proper operation of related equipment.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and

elimination (IDDE) procedures, and spill and response procedures.

- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Related Standard Operating Procedures

1. C.1: Fuel and Oil Handling
2. C.2: Hazardous Material Storage and Handling
3. C.3: Spill Response and Cleanup
4. F.1: Street Sweeping

SOP: Storage and Use of Pesticides and Fertilizer

Introduction

The use and improper storage of pesticides, herbicides, and fertilizers can contribute to the discharge of nutrients and toxic compounds to the municipal storm drainage system and surface waters. The goal of this Standard Operating Procedure (SOP) is to provide guidance on municipal employees on proper handling and storage of pesticides, herbicides, and fertilizers to prevent the discharge of pollutants from the MS4.

Procedures

Below are procedures for the storage and use of fertilizers, pesticides, and herbicides by municipal employees. In this section, the term "pesticide" include products used as herbicides. Refer to SOP 4: Spill Response and Cleanup and SOP 17: Hazardous Materials Storage and Handling for information on and handling spills and hazardous materials.

Storage

- Store pesticides and fertilizers in high, dry locations in accordance with the manufacturer's specifications.
- Store in cool, well-ventilated, and insulated areas to protect against temperature extremes.
- Store in areas that have been constructed in accordance with local fire codes for storing flammable or combustible materials.
    - Flammable products should be stored separately from non-flammable products, preferably in a fire-proof cabinet.
    - Small quantities (less than 500 lbs. or 220 gallons) of pesticides can be stored in cabinets constructed of double-walled 18-gauge sheet metal.
    - Large quantities (greater than 500 lbs. or 220 gallons) of pesticides can be stored in a prefabricated Hazardous Material Storage building or in a purpose-built storage facility. It is not anticipated that many municipal facilities will store quantities in excess of 500 lbs. or 220 gallons of pesticides.
    - Building walls should have a two-hour fire rating and be impervious to the stored materials.
    - Floors should be watertight, impervious, and provide spill containment.
- Store materials in an enclosed area or in covered, impervious containment, such as a locked cabinet. The cabinet should be located in a first story room or one that has direct access to the outdoors. Storage areas should be equipped with easily accessible spill cleanup materials and portable firefighting equipment. Regularly inspect storage areas for leaks and spills. Emergency eyewash stations and emergency drench showers should be located near the storage area.
- For pesticides, storage cabinets should be kept locked and the door to the storage area should contain a weather proof sign that warns of the existence and danger of the pesticides inside. The door should be kept locked. The sign should be visible at a distance of 25 feet and should read as follows:

DANGER
PESTICIDE STORAGE AREA
ALL UNAUTHORIZED PERSONS KEEP OUT
KEEP DOORS LOCKED WHEN NOT IN USE

The sign should be posted in both English and any other language used by maintenance workers.

- Pesticides should not be stored in the same place as ammonium nitrate fertilizer.
- Separate pesticides and fertilizers from other chemical storage and other flammable materials.
- Label all containers with date of purchase. Clearly label all secondary containers. Use older materials first.
- Order for delivery as close to the time of use as possible to reduce the amount of chemicals stored at the facility.
- Order only the amount of materials needed in order to minimize excess or obsolete materials, which require storage and disposal.
- Never leave unlabeled or unstable pesticides and fertilizers in uncontrolled locations.
- Maintain a current written inventory of all pesticides and fertilizers at the storage site.
- Ensure that contaminated waste materials are kept in designated containers and stored in labeled, designated, covered, and contained areas.
- Dispose of excess or obsolete pesticides/fertilizers and associated waste materials in accordance with the manufacturer's specification and all applicable regulations.

Use and Application of Fertilizers

- All fertilizer products manufactured or distributed in the State of Massachusetts must be registered with the Department of Agricultural Resources.
- Perform soil testing before choosing a fertilizer. The quantity of available nutrients already present in the soil will determine the type and amount of fertilizer that is recommended. The soil test will also determine the soil pH, humic matter, texture, and exchangeable acidity, which will indicate whether pH adjustment is required for fertilizer to work efficiently. A soil test should be completed at each facility, as soil type can vary widely within a single community.
    - Soil tests are recommended every 3-4 years for turf and plantings (more frequently for problem or newly planted areas) and every year for soil where phosphorus-containing fertilizers are used. Soil pH tests should be conducted every year for all sites.
    - When collecting soil samples, take multiple samples for each target area at a four-inch depth; mix the samples together in a container and properly label the sample with property information and site use type. Separately sample areas that have discoloration, abnormal plant growth, or other problems. Take the sample at approximately the same time every year. If the area has been fertilized, wait eight weeks after fertilizing to test the soil to ensure nutrients have been absorbed.
- When selecting the optimal type of fertilizer to use on an area, consider the soil test results, type of turf, and type of turf use. Slow-use fertilizer should be used for turf grass.
- Calibrate application equipment regularly to ensure proper application and loading rates.
- Mix fertilizers using clean application equipment under cover in an area where accidental spills will not enter surface water or groundwater and will not contaminate the soil.

- Fertilizers should only be applied by properly trained personnel.
- Never apply fertilizers in quantities exceeding the manufacturer's instructions. Instead, apply small amounts throughout the growing season.
- Time fertilizer application methods for maximum plant uptake, usually in the fall and spring (e.g., between April 15 and October 15). When applying at the beginning and end of planting season, take into consideration the slower uptake rate of fertilizer by plants and adjust the fertilizer application accordingly.
- Never apply fertilizer during a drought, when the soil is dry or frozen, when it is raining, or immediately before expected rain.
- Fertilizer should be applied when the ground temperature is above 55° F.
- Apply fertilizers in amounts appropriate for the type of vegetation to minimize losses to surface water and groundwater. Use the results of the soil test to determine optimal fertilizer timing and application rates.
- Where applicable, till fertilizers into the soil rather than dumping or broadcasting (proper application techniques will depend on the type of soil and vegetation).
- Do not hose down paved areas after fertilizer application if drainage will enter into an engineered storm drain system or drainage ditch.
- Limit irrigation after fertilizer application to prevent runoff (approximately ½ inch of water per application for a week following application).
- Turn off irrigation systems during periods of adequate rainfall.
- Do not over-apply fertilizer in late fall to "use it up" before winter. The effectiveness of fertilizer does not reduce when stored.
- If phosphorus fertilizer is used when re-seeding, mix the phosphorus into the root zone. Do not apply directly to the soil surface.
- Avoid combined products such as "weed and feed," which do not target specific problems at the appropriate time.

Use and Application of Pesticides and Herbicides

The State of Massachusetts has a stringent program for registration of pesticides and certification of those authorized to apply them. Once a pesticide has been approved for use by the USEPA, it must be registered by the Massachusetts Pesticide Board Subcommittee prior to being distributed, purchased, or used in Massachusetts. Pesticide classification in Massachusetts is based on the potential adverse effects the pesticide may have on humans or the environment. "Restricted Use" pesticides can only be sold by Licensed Dealers to Certified Applicators, while "State Limited Use" pesticides may be restricted to use by certain individuals or require written permission from the Department of Agricultural Resources prior to use. Legal application of pesticides must be performed by an individual licensed or certified by the Massachusetts Department of Agricultural Resources. A Commercial Applicator License is required for applying general use pesticides, and a Commercial Applicator Certification is required for applying restricted and state limited use products.

Use and Application of Pesticides

- Pesticides should only be applied by licensed or certified applicators.
- Calibrate application equipment regularly to ensure proper application and loading rates.

- Ensure that pesticide application equipment is capable of immediate shutoff in case of emergency.
- Conduct spray applications according to specific label directions and applicable local regulations.
- Never apply pesticides in quantities exceeding the manufacturer's instructions.
- Apply pesticides at the life stage when the pest is most vulnerable.
- Never apply pesticides if it is raining or immediately before expected rain.
- Establish setback distances from pavement, storm drains, and waterbodies, which act as buffers from pesticide application, with disease-resistant plants and minimal mowing.
- Do not apply pesticides within 100 feet of open waters or of drainage channels.
- Spot treat infected areas instead of the entire location.
- Mix pesticides and clean application equipment under cover in an area where accidental spills will not enter surface water or groundwater and will not contaminate soil.
- Do not hose down paved areas after pesticide application to a storm drain or drainage ditch.
- Recycle rinsate from equipment cleaning back into product.
- Choose the least toxic pesticide that is still capable of reducing the infestation to acceptable levels.
- Use alternatives to pesticides, such as manual weed control, biological controls, and Integrated Pest Management strategies (learn more at: https://www.mass.gov/files/documents/2016/08/wk/ipm-kit-for-bldg-mgrs.pdf).
- For the use of herbicides, reduce seed release of weeds by timing cutting and pesticide application at seed set. Select vegetation and landscaping that is low-maintenance in order to tolerate low levels of weeds without interfering with aesthetics.

Employee Training

- Employees who handle pesticides, fertilizers, and herbicides are trained once per year on proper handling and storage procedures.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Related Standard Operating Procedures

- C.2: Hazardous Materials Storage and Handling
- C.3: Spill Response and Cleanup

APPENDIX D

Standard Operating Procedures – Municipal Vehicles and Equipment

D.1: Operation and Maintenance of Municipal Vehicles and Equipment

D.1: Operations and Maintenance of Municipal Vehicles and Equipment

Introduction

Regular maintenance of both municipal and contracted vehicles and heavy equipment not only prolongs the life of municipal assets but also helps reduce the potential for leaking of fluids associated with normal wear and tear. Potential pollutants include fuels, oil, antifreeze, brake fluid, solvents, and battery acid. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees to help reduce the discharge of pollutants from the MS4 because of leaks from vehicles and equipment. If services are contracted with respect to vehicles and equipment, this SOP should be provided to the contractor. The contract should also specify that the contractor is responsible for compliance with all applicable laws.

The City of Revere undertakes various procedures regarding its municipal vehicles and equipment, which are explained in detail in Section 4.0 of the City's Operation and Maintenance Plan. An inventory of all municipal vehicles and equipment is included in Appendix A of that Plan and updated annually.

Procedures

The City of Revere will implement the following procedures for municipally owned and operated vehicles and equipment to reduce the discharge of pollutants from the MS4:

Vehicle and Equipment Maintenance

Vehicle Storage

- Monitor vehicles and equipment for leaks and use drip pans as needed until repairs can be performed.
- When drip pans are used, avoid overtopping.
- Drain fluids from leaking or wrecked vehicles and parts as soon as possible. Dispose of fluids properly.
- Store and park vehicles on impervious surfaces and/or under cover or indoors whenever possible.

Vehicle Maintenance

- Conduct routine inspections of heavy equipment and vehicles to proactively identify maintenance needs or potential leaks.
- Perform routine preventive maintenance to ensure heavy equipment and vehicles are operating optimally.
- Recycle or dispose of waste properly and promptly.
- Sweep and pick up trash and debris as needed.
- Do not dump any liquids or other materials outside, especially near or in storm drains or ditches.

Body Repair and Painting

- Conduct all body repair and painting work indoors.
- Minimize waste from paints and thinners. Calculate paint needs based on surface area.
- Use dry cleanup methods (vacuum, sweep) to clean up metal filings and dust and paint chips from grinding, shaving and sanding. Sweep debris from wet sanding after allowing it to dry overnight on the shop floor. Dispose of waste properly; never dump waste into storm or sanitary sewers.
- Use sanding tools equipped with vacuum capability to pick up debris and dust.

Fueling

- Fueling areas owned or operated by the municipality should be covered.
- Fueling areas should be evaluated to ensure that pollutants (e.g., gasoline or oil) do not enter the MS4. Follow the procedures in SOP C.1: Fuel and Oil Handling.

Material Management

- Store materials and waste in labeled containers under cover and in secondary containment.
- Chemicals should not be combined in containers.
- Hazardous waste must be labeled and stored according to hazardous waste regulations. Follow the procedures in SOP C.2: Hazardous Materials Storage and Handling.
- Carefully transfer collected fluids from containers into designated storage areas as soon as possible.
- Store new and used batteries securely to avoid breakage. Store indoors or in secondary containment to contain potential acid leaks. Recycle used batteries.
- Conduct periodic inspections of storage areas to detect possible leaks.
- Do not wash or hose down storage areas unless there is prior approval to collect and discharge the water into the sanitary sewer. Use dry cleanup methods whenever possible.
- Keep lids on containers. Store them indoors or under cover to reduce exposure to rain.
- Inspect and maintain all pretreatment equipment, including interceptors, according to the manufacturer's maintenance schedule and at least once per year.
- Proper spill protocol should be followed to prevent chemicals from entering the stormwater system. Follow the procedures in SOP C.3: Spill Response and Cleanup.

Parts Cleaning

- Use designated areas for engine, parts, or radiator cleaning. Do not wash or rinse parts outdoors. If parts cleaning equipment is not available, then capture parts cleaning fluids.
- Recycle cleaning solution. Never discharge waste to the sanitary sewer or storm sewer.
- Use steam cleaning or pressure washing of parts instead of solvent cleaning. Cleaning equipment must be connected to an oil/water interceptor prior entering the sanitary sewer.
- When using solvents for cleaning, drain parts over the solvent tank to avoid drips to the floor. Catch excess solutions and divert them back to tank. Allow parts to dry over the hot tank.

Vehicle and Equipment Washing

Vehicle washing can result in the discharge of nutrients, sediment, petroleum products, and other contaminants to a surface water body or to a stormwater system. The MS4 Permit does not authorize the discharge of municipal vehicle washing byproducts into the MS4.

Outdoor Vehicle Washing Procedures

Outdoor washing of municipal vehicles should be avoided unless wash water is contained in a tight tank or similar structure. Where no alternative wash system is available, and full containment of wash water cannot be achieved, adhere to the following procedures:

- Avoid discharge of any wash water directly to the storm drainage system or surface water (e.g., stream, pond, or drainage swale)
- Minimize the use of water to the extent practicable.
- Where the use of detergent cannot be avoided, use products that do not contain regulated contaminants. The use of a biodegradable, phosphate-free detergent is preferred.
- Do not use solvents except in dedicated solvent parts washer systems or in areas not connected to a sanitary sewer.
- Do not power wash, steam clean, or perform engine or undercarriage cleaning.
- Grassy and pervious (porous) surfaces may be used to promote direct infiltration of wash water, providing treatment before recharging groundwater and minimizing runoff to an adjacent stormwater system. Pervious surfaces or other infiltration-based systems should not be used within wellhead protection areas or within other protected resources.
- Impervious surfaces discharging to the storm drainage system should not discharge directly to a surface water unless treatment is provided. The treatment device should be positioned such that all drainage must flow through the device, preventing bypassing or short-circuiting.
- Periodic sweeping and/or cleaning should be completed to prevent accumulation from forming on the washing area.
- Maintain absorbent pads and drip pans to capture and collect spills or noticeable leaks observed during washing activities. Follow the procedures in SOP C.3: Spill Response and Cleanup.
- Heavily soiled vehicles or vehicles dirtied from salting or snow removal efforts should follow the SOPs in the "Heavy Equipment Washing Procedures" below.

Indoor Vehicle Washing Procedures

- Vehicles and equipment should be washed inside whenever possible to reduce runoff to the stormwater system.
- Where the use of detergent cannot be avoided, use products that do not contain regulated contaminants. The use of biodegradable, phosphate-free detergent is preferred.
- Detergents should not be used in areas where oil/water separators provide pre-treatment of drainage.
- Floor drains should be connected to a sanitary sewer or tight tank. Floor drains discharging to adjacent surface water bodies or engineered storm drain systems should be permanently plugged or otherwise abandoned before any vehicle wash activities are completed.
- Designate separate areas for routine maintenance and vehicle cleaning. This helps prevent

contamination of wash water by motor oils, hydraulic lubricants, greases, or other chemicals.

- Dry cleanup methods are recommended within garage facilities. Do not wash down floors and work areas with water.
- Bring smaller vehicles to commercial washing stations.
- Maintain absorbent pads and drip pans to capture and collect spills or noticeable leaks observed during washing activities. Follow the procedures in SOP C.3: Spill Response and Cleanup.

Heavy Equipment Washing Procedures

- Mud and heavy debris removal should occur on impervious surfaces or within a retention area.
- Maintain these areas with frequent mechanical removal and proper disposal of waste.
- Impervious surfaces with engineered storm drain systems should not discharge directly to a surface water.
- Floor drains should be connected to a sanitary sewer or tight tank. Floor drains discharging to adjacent surface waterbodies or engineered storm drain systems should be permanently plugged or otherwise abandoned before any vehicle wash activities are completed.
- Where the use of detergent cannot be avoided, use products that do not contain regulated contaminants. The use of biodegradable, phosphate-free detergent is preferred.
- Detergents should not be used in areas where oil/water separators provide pre-treatment of drainage.
- Maintain absorbent pads and drip pans to capture and collect spills or noticeable leaks observed during washing activities. Follow the procedures in SOP C.3: Spill Response and Cleanup.

Engine and Steam Washing Procedures

- Do not wash parts outdoors.
- Maintain drip pans and smaller containers to contain motor oils, hydraulic lubricants, greases, etc. and to capture and collect spills or noticeable leaks observed during washing activities, to the extent practicable. Follow the procedures in SOP C.3: Spill Response and Cleanup.
- Where use of detergent cannot be avoided, use products that do not contain regulated contaminants. The use of a biodegradable, phosphate-free detergent is preferred.
- Avoid cleaning with solvents except in dedicated solvent parts washer systems. Make use of pressure washing and steam cleaning.
- Recycle clean solutions and rinse water to the extent practicable.
- Wash water should discharge to a tight tank or a sanitary sewer via an oil/water separator. Detergents should not be used in areas where oil/water separators provide pre-treatment of drainage.

Employee Training

- Employees who perform work on/with municipal vehicles or equipment are trained once per year on these procedures and the proper operation of related equipment.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

APPENDIX E

Standard Operating Procedures – Catch Basin Inspection and Cleaning

E.1: Catch Basin Inspection and Cleaning

E.1: Catch Basin Inspection and Cleaning

Introduction

Catch basins help minimize flooding and protect water quality by removing trash, sediment, decaying debris, and other solids from stormwater runoff. These materials are retained in a sump below the invert of the outlet pipe (older catch basins may not have a sump). Catch basin cleaning reduces foul odors, prevents clogs in the storm drain system, and reduces the loading of trash, suspended solids, nutrients, bacteria, and other pollutants to receiving waters. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees on catch basin inspection and cleaning to reduce the discharge of pollutants from the MS4. If services are contracted, this SOP should be provided to the contractor. The contract should specify that the contractor is responsible for compliance with all applicable laws.

This SOP can also be used for inspection of catch basins or manholes for the purpose of conducting catchment investigations as part of the municipality's Illicit Discharge Detection and Elimination program.

The Revere DPW performs routine inspections, cleaning, and maintenance on over 4,000 catch basins that are located within the City of Revere. The City of Revere will include an optimization plan for catch basin cleaning and inspection in its annual report. A description of current City practices for catch basin cleaning and inspection is included in Section 5.2 of the Operation and Maintenance Plan.

Revere will implement the following catch basin inspection and cleaning procedures to reduce the discharge of pollutants from the MS4:

Procedures

Inspection and Cleaning Frequency

- Each catch basin should be cleaned and inspected at least annually.
- Catch basins near construction activities (roadway construction, residential, commercial, or industrial development or redevelopment) or high-use areas should be inspected and cleaned more frequently if inspection finds excessive sediments or debris loadings.
- Catch basins should be cleaned to ensure that they are no more than 50 percent full[1] at any time. Establish inspection and maintenance frequencies needed to meet this "50 percent" goal. If a catch basin sump is more than 50 percent full during two consecutive inspections, document the findings, investigate the contributing drainage area for sources of excessive sediment loading, and, if possible, address the contributing sources. If no contributing sources are found, increase the inspection and cleaning frequencies of the sump.
- Street sweeping performed on an appropriate schedule will reduce the amount of sediment, debris, and organic matter entering the catch basins, which will in turn reduce the frequency with which they need to be cleaned. Reference SOP 16: Streets and Parking Lots for information on appropriate street sweeping frequencies. Street sweeping schedules should also be adjusted based on catch basin inspection findings, with more frequent sweepings for areas with higher catch basin loads.

[1] . A catch basin sump is more than 50 percent full if the contents within the sump exceed one half the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin

Inspection and Cleaning Procedures

Catch basin inspection and cleaning procedures should address both the grate opening and the catch basin structure, including the sump and any inlet and outlet pipes. Document any and all observations about the condition of the catch basin structure and water quality (an inspection form and log of catch basins cleaned or inspected are included in the attachments). Collect data on the condition of the physical basin structure, its frame, and the grate, as well as on the quality of stormwater conveyed by the structure. Observations like those below can indicate sources of pollution within the storm drain system:

- Oil sheen
- Discoloration
- Trash and debris

Both oil and bacteria can create a sheen on the water's surface. The source of a sheen can be differentiating by disturbing it (e.g., with a pole). A sheen caused by oil will remain intact and move in a swirl pattern, while a sheen caused by bacteria will separate and appear "blocky." The bacteria that cause this sheen are naturally occurring iron bacteria – they are not considered a pollutant but should be noted. Other types of bacteria, such as fecal bacteria, are considered pollutants and their discovery should be recorded

Observations like those below can indicate a potential connection of a sanitary sewer to the storm drain system, which is an illicit discharge:

- Indications of sanitary sewage, including fecal matter or sewage odors
- Foaming, such as from detergent
- Optical enhancers, fluorescent dye added to laundry detergent

In general, adhere to the following procedures when inspecting and cleaning catch basins. Record the findings in the log in the attachments:

1. Implement appropriate traffic safety procedures (e.g., traffic cones) prior to and during the catch basin inspection and cleaning process.
2. Work upstream to downstream in a given drainage network.
3. Clean sediment and trash off the grate.
4. Visually inspect the outside of the grate.
5. Remove the grate and visually inspect the inside of the catch basin to determine cleaning needs.
6. Inspect the catch basin for structural integrity.
7. Determine the most appropriate equipment and method for cleaning the basin:
    a. Manually use a shovel to remove accumulated sediments.
    b. Use a bucket loader to remove accumulated sediments.
    c. Use a high pressure washer to clean any remaining material out of the catch basin while capturing the slurry with a vacuum.
    d. If necessary, after the catch basin is cleaned, use the rodder of the vacuum truck to clean the downstream pipe and pull back sediment that might have entered it.
8. If contamination is suspected, chemical analysis will be required to determine if the materials comply with the Massachusetts Department of Environmental Protection (MassDEP) Hazardous Waste Regulations, 310 CMR 30.000 (https://www.mass.gov/files/documents/2016/08/xl/310cmr30_7883_54357.pdf). The chemical analysis required will depend on suspected contaminants. Note the identification number of the catch basin on the sample label and note sample collection on the Catch Basin Inspection Form.

Handling and Disposal of Catch Basin Cleanings

- Properly dispose of collected sediments and catch basin cleanings (solid material, such as leaves, sand, and twigs removed from stormwater collection systems during cleaning operations).
- Cleanings from stormwater-only drainage systems may be disposed at any landfill that is permitted by MassDEP to accept solid waste. MassDEP does not routinely require stormwater-only catch basin cleanings to be tested before disposal, unless there is evidence that they have been contaminated by a spill or some other means.
- Screenings may need to be placed in a drying bed to allow water to evaporate before proper disposal. In this case, ensure that the screenings are managed properly to prevent pollution.
- Catch basin cleanings must be handled and disposed in accordance with compliance with the applicable MassDEP regulations, policies, and guidance (https://www.mass.gov/files/documents/2018/03/09/catch-basins.pdf).

Documentation and Reporting

The following information should be documented and included in the municipality's annual report – use the catch basin inspection log provided in the attachments to document the information to include in the report (alternatively, obtain records of volume of debris removed to include in the report):

- Metrics and other information used to reach the determination that the established plan for cleaning and maintenance is optimal for the MS4 (include in the SWMP and first annual report)
- Any action taken in response to excessive sediment or debris loadings
- Total number of catch basins
- Number of catch basins inspected
- Number of catch basins cleaned
- Total volume or mass of material removed from catch basins.
-

Employee Training

- Employees who perform catch basin cleaning and inspection are trained once per year on these procedures and the proper operation of related equipment.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Related Standard Operating Procedures

- 1. SOP F.1: Street Sweeping

APPENDIX F

Standard Operating Procedures – Street Sweeping

F.1: Street Sweeping

SOP F1: Streets and Parking Lots

Introduction

Regular sweeping of streets and municipally-owned parking lots is important for maintaining clean and safe roadways. It also plays a vital role in keeping pollutants like sand, trash, and leaves out of the MS4. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees on street and parking lot sweeping procedures and frequencies to reduce the discharge of pollutants to the storm drainage system and receiving waters. If sweeping services are contracted, this SOP should be provided to the contractor. The contract should specify that the contractor is responsible for compliance with all applicable laws.

Streets and municipally-owned parking lots are swept once every two weeks in Revere between April and November. A schedule of street sweeping is maintained on the City's website and GIS database. Streets are swept at least once every two weeks, with the busiest streets swept once or multiple times weekly. Cleanings brought to the DPW Facility at 321 R. Charger St. for temporary storage before being collected by contractor, W.L. French for disposal.

Procedures

The City of Revere will implement the following street and parking lot sweeping procedures to reduce the discharge of pollutants from the MS4:

Sweeping Frequency

- All streets should be swept and/or cleaned a minimum of once per year in the spring (with the exception of rural uncurbed roads with no catch basins or high speed limited access highways).
- Sweep as soon as possible after snow melt and following winter activities such as sanding to capture sand and debris before it is washed into the storm drainage system.
- Consider more frequent sweeping for targeted areas based on pollutant load reduction potential, inspections, pollutant loads, catch basin cleaning or inspection results, land use, impaired waters, or other factors.
- The City of Revere's annual report should include the sweeping schedule developed above to target areas with high pollutant loads if required.

Sweeping Practices

- Street sweeping should be conducted in dry weather. Sweeping should not be conducted during or immediately after rain storms.
- Dry cleaning methods should be used whenever possible, with the exception of very fine water spray for dust control. Avoid wet cleaning or flushing of the pavement.
- When necessary, enact parking bans to facilitate sweeping on busy streets.
- Sweep in a manner that avoids depositing debris into storm drains.
- Sweeping equipment (mechanical, regenerative air, vacuum filter, tandem sweeping) should be selected depending on the level of debris. Brush alignment, sweeper speed, rotation rate, and sweeping pattern should be set to optimal levels to manage debris.
- Routinely inspect and perform maintenance on sweeping equipment to reduce the potential for leaks.

Sweepings Reuse and Disposal

- The reuse of sweepings is recommended by MassDEP. If street sweepings are reused (e.g., as anti-skid material or fill in parking lots), they should be properly filtered to remove solid waste, such as paper or trash, in accordance with their intended reuse. All reuse and/or disposal of street sweepings will be managed in accordance with current MassDEP policies and regulations.
- Sweepings intended for reuse can be stored for up to one year in approved temporary storage areas. Storage areas should be protected to prevent erosion and runoff and should be located away from wetland resource areas and buffer zones, surface water, or groundwater.
- Sweepings are classified as solid waste. If not reused, they should be disposed of at solid waste disposal sites.
- For additional information on approved reuses of sweepings and storage/disposal policies, refer to MassDEP policy #BAW-18-001: Reuse and Disposal of Street Sweeping (https://www.mass.gov/files/documents/2018/05/14/street-sweepings.pdf).

Documentation and Reporting

The following information should be documented and included in each annual report:

- Number of miles cleaned, or the volume or mass of material removed (refer to the sweeping log in the attachments).

Employee Training

- Employees who perform street and parking lot sweeping are trained once per year on these procedures and the proper operation of related equipment.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.
- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

Attachments

1. Street and Parking Lot Sweeping Log

Related Standard Operating Procedures

1. SOP 21: Operations and Maintenance of Municipal Vehicles and Equipment

APPENDIX G

Standard Operating Procedure – Salt Use Optimization/ Winter Road Maintenance

G.1: Salt Use Optimization/ Winter Road Maintenance

SOP G.1: Winter Road Maintenance

Introduction

Winter road maintenance includes snow removal and the use of salt, sand, or deicers to ensure safe winter driving conditions. Proper maintenance procedures and use and storage of materials can help reduce the discharge of pollutants, such as sand and salt, from the MS4 and to receiving waters. The goal of this written Standard Operating Procedure (SOP) is to provide guidance to municipal employees on the use and storage of salt and sand, minimizing the use of salt, evaluating opportunities for use of alternative materials, and ensuring that snow disposal activities to not result in disposal of snow into surface waters. If services are contracted, this SOP should be provided to the contractor. The contract should specify that the contractor is responsible for compliance with all applicable laws.

The City of Revere performs a variety of maintenance activities to ensure safe winter driving conditions on its roads and parking lots. When precipitation begins, DPW responds by pre-treating the main roads. Salting of main roads and public transportation/school bus routes will allow traffic to keep moving and prevent snow from bonding to the pavement. After initial roadway treatment an evaluation will be made if additional treatment will be required.

Snow plowing begins when snow accumulates to two (2) or more inches. During the plowing operations, it is the City's policy to focus on main streets, emergency routes, public transportation/school bus routes and hill sections of the city. During prolonged snowstorms, it is necessary for the operators to make repeated passes on the main streets to keep traffic moving, which may create a delay for the plows getting into the neighborhoods. Secondary streets are worked on after the main streets have been opened. During the storm, the emphasis for secondary streets is to create a single passable lane down the middle that can be navigated for vehicle travel. DPW will continue to monitor the conditions of the roadways and determine if additional snow clearing equipment is needed or if equipment may need to be reassigned to another section of the city.

Once the precipitation has ended, DPW conducts a final citywide snow clearing operation. This operation includes snow removal, street widening (curb-to-curb), and general cleanup to make the roadways safe for vehicular and pedestrian traffic. DPW will prioritize based on order of importance as follows:

1. Main streets and public transportation/school bus routes are treated to achieve the safest possible conditions.
2. Residential streets with hills and major intersections are treated to improve traction and safety.
3. Flat streets are treated only if icy conditions exist.
4. Downtown and other business areas are treated and snow removal may take place if needed.
5. Snow piles at intersections are pulled away from the corners to improve sight lines.
6. Snow removal on narrow streets that prevent access for emergency and public service vehicles.

Procedures

Revere will implement the following winter maintenance procedures to reduce the discharge of pollutants from the MS4:

Equipment and Maintenance

- Calibrate equipment to reduce and optimize salt use and ensure deicing agents are being used efficiently. Provide employee training on proper calibration procedures.
- Do not overfill trucks with deicing materials as it may lead to spills.
- Encourage the use of automated application equipment like zero velocity spreaders.
- When possible, retrofit vehicles to include equipment such as on-board application regulators, temperature sensors for air and pavement, and anti-icing and pre-wetting equipment.
- Wash equipment using proper procedures to prevent pollutants from entering the stormwater system. Dry cleanup procedures should be used when possible.
- Regularly inspect and maintain equipment to reduce the potential for leaks.

Anti-icing and Deicing

- Minimize the use and optimize the application of sodium chloride and other salt[1] (while maintaining public safety) and consider opportunities for use of alternative materials.
- Optimize sand and/or chemical application rates through the use, where practicable, of automated application equipment (e.g., zero velocity spreaders), anti-icing and pre-wetting techniques, implementation of pavement management systems, and alternate chemicals.
- Remove as much snow as possible using mechanical means like plowing, blowing, or shoveling before deicing to reduce the need for road salt or other deicing chemicals.
- When possible, use anti-icing practices to prevent ice formation and reduce the need for deicers.
- Apply anti-icing agents 1-2 hours before winter weather events to ensure optimal performance (can be applied up to 24 prior).
- Only apply road salt when the pavement temperature is above 15° F.
- When using deicers, use pre-wetting agents (e.g., salt brine) to help them work more efficiently and to reduce road salt scatter and bounce.
- Salt brine solution used for anti-icing and pre-wetting can be stored for up to a year –concentration should be tested before use. If temperatures fall below 0° F, use a circulator pump to prevent the brine from freezing.
- Use alternative deicing materials instead of sodium chloride as appropriate (e.g., calcium magnesium acetate, magnesium chloride, or calcium chloride).
- Avoid mixing road salt and sand. Doing so makes both the salt and sand work less efficiently and leads to over-application.
- Only apply enough deicer so that plows can remove the snow and ice. Adjust the application rate of deicers based on the type of storm, type of agent used, and anti-icing and pre-wetting techniques used.
- Perform unloading/loading of trucks on impervious surfaces whenever possible. These areas should be frequently cleaned and swept to reduce the tracking and runoff of salt and to capture any spills.
- Track the amount of deicer used and maintain records of the application of sand, anti-icing and/or de-icing chemicals to document the reduction of chemicals to meet established goals.

Storage of Deicing Materials

[1] For purposes of the MS4 Permit, salt means any chloride-containing material used to treat paved surfaces for deicing, including sodium chloride, calcium chloride, magnesium chloride, and brine solutions.

- Prevent exposure of deicing product (salt, sand, or alternative products) storage piles to precipitation by enclosing or covering the storage piles. Implement good housekeeping, diversions, containment or other measures to minimize exposure resulting from adding to or removing materials from the pile. Store piles in such a manner as not to impact surface water resources, groundwater resources, recharge areas, and wells.
- Store materials under covered or enclosed areas and on impervious surfaces.
- Ensure that there are adequate drainage controls in storage areas to prevent runoff from entering the stormwater system.
- Follow appropriate loading and unloading procedures. If there are spills when loading or unloading materials, follow the protocol outlined in SOP 4: Spill Response and Cleanup.
- Frequently sweep near the storage/loading areas to reduce the amount of salt, sand, or other materials that is tracked out.
- For liquid deicing chemicals, provide secondary storage containment.
- Do not store road salt near drinking water supplies, surface water resources, groundwater resources, recharge areas, and wells. Follow proper storage guidelines from MassDEP (https://www.mass.gov/guides/guidelines-on-road-salt-storage).

Snow Storage and Disposal

- Snow should not be pushed or dumped into waterbodies or wetlands, into stormwater drainage swales or ditches, or on top of catch basins.
- Snow should not be stored near drinking water areas, waterbodies, or wetlands.
- Avoid storing snow in areas that are unstable, areas of potential erosion, or high points where snow may melt and collect debris as runoff before it enters the stormwater system.
- Consider sun exposure when storing snow. Snow in areas with higher sun exposure will melt faster but may require deicers if the snowmelt refreezes.
- Consider practices such as living snow fences to contain snow piles and reduce snow drifting.
- The MS4 Permit prohibits snow disposal into waters of the United States. Snow disposal and storage activities, including selection of appropriate snow disposal sites, will adhere to the MassDEP Snow Disposal Guidance, Guideline No. BWR G2015-01 (http://www.mass.gov/eea/agencies/massdep/water/regulations/snow-disposal-guidance.html).

Reporting

Revere will document and include the following information in its annual report when required:

- Road miles treated
- Type and amount of deicer used
- Equipment calibration records
- Employee training dates

Employee Training

- Employees who perform winter road maintenance are trained once per year on these procedures and the proper operation of related equipment.
- Employees are also trained on stormwater pollution prevention, illicit discharge detection and elimination (IDDE) procedures, and spill and response procedures.

- If services are contracted, the contractor should be given a copy of this and any applicable SOPs to ensure compliance with MS4 regulations.

APPENDIX H

Standard Operating Procedure – Inspection and Maintenance of Stormwater Treatment Structures

H.1: Inspection and Maintenance of Structural Stormwater Best Management Practices (BMPs)

Revere, Massachusetts
Department of Public Works (or similar)

Standard Operating Procedures:
Inspection and Maintenance of Structural Stormwater Best Management Practices (BMPs)

Purpose of SOPs

This Standard Operating Procedure (SOP) includes general descriptions, inspection procedures, and routine and non-routine maintenance requirements for the following structural BMPs:

1.0 Deep Sump Catch Basins
2.0 Proprietary Separators
3.0 Bioretention Basins
4.0 Subsurface Infiltration Systems
5.0 Porous Asphalt
6.0 Grass Swales
7.0 Stone Border & Vegetated Filter Strips
8.0 Sediment Forebays
9.0 Detention Basins

MA Small MS4 General Permit Requirement Summary:

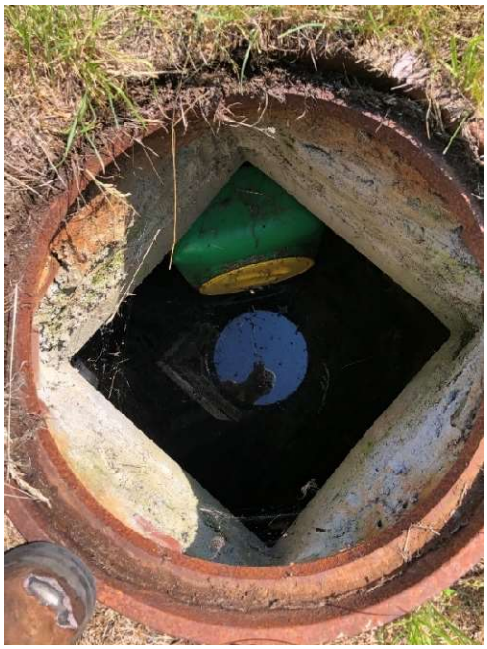
Part 2.3.7.a.iii.6 - The permittee shall establish and implement inspection and maintenance frequencies and procedures for all stormwater treatment structures such as water quality swales, retention/detention basins, infiltration structures, proprietary treatment devices or other similar structures. All permittee-owned stormwater treatment structures (excluding catch basins) shall be inspected annually at a minimum.

1.0 Deep Sump Catch Basins

Description and Function

These structures are modified catch basins that collect stormwater from small drainage areas with added features to enhance the capture of gas, oils, grease, trash, floating debris, and sediment over that of conventional catch basins and stormwater inlets. The inlet of the deep sump catch basin is a cast iron grate over the precast concrete structure. The sump is over-sized to a minimum depth of 4 feet below the elevation of the outlet pipe invert to enhance trapping of sediment. The outlet pipe includes a “snout” which is a hooded outlet cover that keeps floating hydrocarbons and other floating debris in the structure chamber until they settle with the sediment or is removed by a pumper truck as part of the routine cleaning.

Deep sump catch basins are not efficient enough to provide effective pollutant removal alone but are an improvement over conventional catch basins and are effective as a pretreatment device for other stormwater BMPs as they are being used in this case.



Inspections

Deep sump catch basins should be inspected at least four times per year including at the end of the foliage and snow removal seasons. For a full inspection, remove the grate and inspect the general condition of the unit including the amount of floating debris and the presence of hydrocarbons, if any. If the inspection finds a large presence of hydrocarbons, such as a layer of floating oil or a strong odor of gas, hydrocarbons should be removed immediately. Measure the amount of sediment that has collected. Pipe outlets should be clear of debris. To be effective, the 4-foot-deep sump must be watertight to maintain a permanent pool to the outlet pipe invert. If the water level is below the outlet pipe, closer inspection for possible leaks is warranted. Note that a water level somewhat below the outlet level is normal during extended periods with no precipitation due to evaporation and minor expected seepage.

Routine Maintenance

Initially, deep sump catch basins should be cleaned a minimum of two times per year and additionally, if necessary, based on the results of the quarterly inspection. Cleaning consists of the removal of floating hydrocarbons and accumulated sediment, and clearing the inlet grate and outlet tee and pipe. Sediment should be removed from the deep sump catch basin if the measurement of the sediment is over 1 foot in depth. A hazardous waste disposal contractor must perform the removal of hydrocarbons.

Non-Routine Maintenance

These are structural repairs and replacement of system components. Typical items for this BMP may include:

- Repairing the outlet trap and/or pipe.
- Filling cracks in the concrete.
- Patching of mortar and brick.
- Resetting of inlet grates.

2.0 Proprietary Separators

Description and Function

Separators are stormwater treatment units designed to remove pollutants like sediment, oils, hydrocarbons, and other debris and contaminants from stormwater runoff. These units use physical processes including swirling and gravity sedimentation to separate particles from the flow and allow the treated flow to continue downstream to the next drainage structure. These devices are often constructed within the last drain manhole in a stormwater network but can also be installed across a site to contribute to a larger stormwater treatment chain. Hydrodynamic separators are a type of separator that swirl stormwater for sedimentation. Stormceptors are an example of a proprietary brand of hydrodynamic separator.

Inspections

Separators should be inspected on a bi-monthly basis and after major storm events for the first year. Remove the cover and inspect the general condition of the separator including the amount of floating debris and the presence of hydrocarbons, if any. If the inspection finds a large presence of hydrocarbons, such as a layer of floating oil or a strong odor of gasoline, it should be removed immediately. Measure the amount of sediment that has collected using a measuring stick or “Sludge Judge” measuring tube. Pipe inlets and outlets should be clear of debris. After the first year, the number of inspections may be reduced based on the experience during the first year monitoring, but not less than once per year. Inspections are recommended once at the end of the foliage season and once at the end of the snow season.

Routine Maintenance

The units should be cleaned a minimum of two times during the first year, when the sediment level reaches 75% of the capacity of the isolated sump, or when an appreciable level of hydrocarbons and trash have accumulated, per the manufacturer’s maintenance specifications. Cleaning consists of the removal of floating hydrocarbons and accumulated sediment and clearing the inlet pipes. The removal of hydrocarbons must be performed by a hazardous waste disposal contractor. Removal

of the sediment is by a standard vacuum truck.

Non-Routine Maintenance

These are structural repairs and replacement of system components. Typical items for this BMP may include:

- Repairing the inlet or outlet pipes.
- Filling cracks in the concrete.
- Resetting of covers.

3.0 Bioretention Basins

Description and Function

Bioretention is a technique that uses soils, plants, and microbes to treat stormwater before it is infiltrated and/or discharged. Bioretention cells are shallow depressions filled with sandy soil topped with a thick layer of mulch and planted with dense native vegetation. The runoff percolates through the soil media that acts as a filter.

There are two types of bioretention cells: those that are designed solely as organic filter, filtering bioretention areas and those configured to recharge groundwater in addition to acting as a filter exfiltrating bioretention area.

Inspections

Bioretention areas require careful attention while plants are being established and seasonal landscaping maintenance thereafter. Inspect pretreatment devices and bioretention cells regularly for sediment build-up, structural damage, and standing water. Overall, the bioretention areas should be inspected monthly. Remove and replace dead vegetation as well as trash and other debris. The areas should be inspected for trash, debris, vegetative health, stability, and soil erosion.

Routine Maintenance

Remove and replace dead vegetation semi-annually or as needed. Removal of trash and debris should take place monthly with replacement of the mulch occurring one to two times per year. Prune the vegetation one to two times per year. Other tasks include fertilizing (only when necessary), liming, watering, pruning, and weed and pest control, if necessary, to maintain the health of the vegetated cover.

Non-Routine Maintenance

These are structural repairs and replacement of system components. Typical items for this BMP may include:

- Major repairs to vegetation.
- Replace the media and vegetation every 3-5 years.
- Erosion of areas creating an improperly functioning BMP.
- Rototilling of the surface to break up surface compaction and replanting.

4.0 Subsurface Infiltration Systems

Description and Function

Subsurface (underground) infiltration systems are used to help meet the recharge requirements and to treat runoff from the paved areas of the site per the MassDEP Stormwater Management Standards. These systems can be a series of pipes surrounded by washed stone and filter fabric or a series of chambers with crushed stone which aid in infiltration. The systems are constructed with permeable soil suitable for infiltrating. Overflows are provided for the system once the storage volume is exceeded. Observation ports are finished to grade and are used for observation and inspection of the system.

Inspections

The infiltration systems should be inspected after every major storm for the first few months. After

this period, it may be inspected once each year and should preferably be done two to three days after a significant storm event. The inspection should examine whether the chamber is draining properly following storms. The underground infiltration system should drain within a maximum of 72 hours. Pipe inlets and outlets should be clear of debris and there should be no significant accumulation of sediment in the chambers. The annual inspection of the infiltration systems should include removal of the key manhole covers/observation ports to view the interior of the chamber. If significant accumulation of sediment occurs, most will be near the inlet pipe(s) to the underground chamber and can be removed by hand or vacuum pumper. A significant accumulation of sediment may indicate a problem with soil migrating into the system from the surrounding soil indicating a failure of the filter fabric protection or a pipe problem in the pipe leading into the system. Also, the outlet control structure for each subsurface recharge system shall be inspected. Refer to the inspection section for the Deep Sump Catch Basin portion of this plan for the proper procedures.

Routine Maintenance

The stormwater system includes significant pretreatment BMPs that protect the recharge systems so sediment removal should rarely be required. Routine maintenance generally includes clearing debris from the inlet and outlet pipes if found during an inspection.

Non-Routine Maintenance

These are structural repairs and replacement of system components. Typical items for this BMP may include:

- Repairing the inlet pipes.
- Filling cracks in the concrete.
- Resetting of covers.
- Removal of significant accumulation of sediment from the chambers that affects the infiltration capacity.

5.0 Porous Asphalt

Description and Function

Stormwater management functions of porous asphalt installations include water quality treatment, peak flow reduction, and stormwater volume reduction via groundwater recharge. The porous asphalt system consists of a durable, load bearing, porous surface overlying several layers of specialized aggregate courses to filter, store, and infiltrate stormwater.

Inspections

Inspect the surface monthly to check for clogging and deterioration. Monitor to ensure that the paving surface drains properly after storms. Ideally, inspections should occur during or just after a rainfall event. This system also includes inspection ports to observe how well the base is draining and should be dry within 72 hours following a rain event. These should be inspected during the routine inspections, preferably following a rain event.

Routine Maintenance

Porous asphalt can be prone to clogging from sand and fine sediments that fill void spaces and joints between pavers. Surfaces should be cleaned with a regenerative air sweeper at least four times per year and more if conditions warrant.

Non-Routine Maintenance

These are structural repairs and replacement of system components. Typical items for this BMP may include:

- Patching porous pavement.
- Repairs to underlying stone aggregate courses.

6.0 Grass Swale

Description and Function

Grass swales are designed to convey stormwater while also infiltrating and filtering runoff. The conveyance will include thick vegetation to help aid in the removal of sediment and other pollutants. These structures usually lead to an inlet to the stormwater system or a primary BMP structure.

Inspections

Grass swales should be inspected semi-annually with additional inspections during the first few months to ensure that the vegetation becomes adequately established. Repairs and reseeding should be done as needed. The swales should be inspected for slope integrity, soil moisture, vegetative health, soil stability, soil compaction, soil erosion, ponding and sedimentation. Ponding should only be present if the downstream BMP is in a flooded condition that is backing into the swale. Otherwise, the swale should be free draining.

Routine Maintenance

Repairs and reseeding may be needed during the first few months until the vegetation becomes secure. The swales should be mowed twice per year with one in the mid-summer and the grass clippings should be removed. Trees and shrubs must not be allowed to grow in the swale. The grass should not be cut shorter than 4 inches. Sediment and debris should be removed at least once a year in late spring. Other tasks include fertilizing and/or liming, if called for in the turf management plan.

Non-Routine Maintenance

These are structural repairs and replacement of system components. Typical items for this BMP may include:

- Major repairs of slope.
- Bottom restoration may be required if it is found that significant ponding is occurring for an extended period following a storm event, the bottom may need to be regraded to promote drainage.

7.0 Stone Border & Vegetated Filter Strips

These structures border impervious area, typically a parking lot or roadway, and provide stormwater treatment to sheet flow from the impervious area. The stone border helps remove debris and sediment from the runoff and any water that flows past the stone border will be treated by the strip of vegetation. Sediment and pollutant removal occur in the thickly vegetated strip and helps infiltrate treated stormwater into the ground.

Inspections

The BMPs should be inspected after every storm event greater than 1 inch during the establishment period. After the establishment period, inspections shall occur on a quarterly basis for the first two years following the completed installation and then twice per year thereafter.

The stone should be inspected for general condition of the unit including the amount of debris, the presence of hydrocarbons, if any, the amount of sediment, the condition of the vegetation within and adjacent to the stone border, the condition of the outfall and the area downstream. If the inspection finds a significant presence of sediment, it should be removed. Measure the amount of sediment that has collected. Special attention should be paid to make sure no erosion has taken place around the lip of the stone border. Repairs and the addition of more stone should be done, as necessary.

The vegetated filter strip should be inspected for clogging, density of vegetation, damage by foot or vehicular traffic excessive accumulations and channelization. Sediment and debris should be removed when buildup exceed 2 inches in depth in any area. If erosion is observed, measures shall be taken to improve the stone border in order to address the erosion. Rills and gullies observed along the filter strip may be filled with topsoil, stabilized with erosion control matting and either seeded or sodded as desired. For channels less than 12 inches wide, filling with crushed gravel, which allows vegetation to creep in over time, is acceptable. For channels wider than 12 inches, regrading and reseeding may be necessary. Regrading may also be required when pools of standing water are observed along the slope. In no case shall standing water be tolerated for longer

than 48-72 hours. Sediment shall be removed when the filter strip is thoroughly dry. Trash and debris shall be removed whenever observed and deposited only at suitable disposal/recycling sites.

Routine Maintenance

The stone border shall be cleaned a minimum of once per year and additionally, if necessary, based on the results of the inspections. Cleaning consists of the removal of accumulated sediment and debris. Vegetation around the spreader should be mowed or trimmed throughout the year, but not less than twice per year (June and September), with the clippings removed and disposed of outside the area around the stone border. If the filter strip has eroded or is no longer level, it should be fixed immediately to prevent further erosion. A hazardous waste disposal contractor must perform the removal of hydrocarbons, if any. The vegetated filter strip shall be maintained to have a thick and healthy vegetative cover. Grass cover shall be mowed as necessary to maintain a minimum grass height of 4 inches. Mowing shall be done only when the soil is dry in order to prevent tracking damage to the vegetation, soil compaction and flow concentrations. Generally speaking, grasses may be allowed to grow as high as desired but mowed frequently enough to avoid troublesome insects or noxious weeds. Fall mowing should be controlled to a grass height of 6 inches to provide adequate winter wildlife habitat.

Non-Routine Maintenance

These are structural repairs and replacement of system components. Typical items for this BMP may include:

- Repair of erosion from outlet of lip of the stone border.
- Re-vegetation of surrounding areas.
- Repair and/or replacement of stone.
- Adjustment leveling of outfall.
- Major repairs to the vegetated filter strip.
- Repair to gullies by reseeding or filling with crushed gravel.

8.0 Sediment Forebays

Description and Function

A sediment forebay is a pretreatment device designed to slow incoming stormwater flow and provide sediment removal prior to discharge to a subsequent primary BMP. The volume of the forebay generally contains the equal of 0.1 inches of runoff from the contributing watershed area or 400 cubic feet per acre of impervious surface tributary to the forebay. This larger liquid volume provides enhanced settlement of suspended sediment to protect the downstream stormwater BMPs.

The forebays can be riprap channels or basins with sumps to provide for minor ponding and outlet control to the stormwater basin. They can also be structural underground tanks. Under normal conditions, the forebays act as pre-treatment to filter out sediment and control flow to their respective primary BMP.

Inspections

Forebays should be inspected monthly and following large storm events (greater than 2 inches) following installation. Inspect the general condition of the unit including the amount of floating debris and the presence of hydrocarbons, if any. If the inspection finds a large presence of hydrocarbons, such as a layer of floating oil or a strong odor of gas, it should be removed immediately, and the source of the hydrocarbons should be investigated for further removal at upstream BMPs. Measure the amount of sediment that has collected. Pipe inlets and outlets should be clear of debris. Filter berms (if applicable) should be intact, clear of debris and functional.

Routine Maintenance

The forebays should be cleaned twice per year and additionally or less, as necessary, based on the results of the monthly inspection. Cleaning consists of the removal of floating hydrocarbons and accumulated sediment and clearing the outlet pipe. The forebay should be cleaned of sediment if the sediment is over 1 foot in depth. A hazardous waste disposal contractor must perform the removal of hydrocarbons.

The side slopes of the forebays should be mown at least once per year to control woody growth.

Non-Routine Maintenance

These are structural repairs and replacement of system components. Typical items for this BMP may include:

- Repairing the inlet pipes.
- Repairing erosion from outlet of forebay.
- Replacing or repair of stone lining.

9.0 Detention Basin

Description and Purpose

A stormwater detention basin is a large open, vegetated ponding area that temporarily detains stormwater runoff from the site and regulates the outflow to the downstream drainage system. The outflow is controlled via an outlet control device and overflow is often provided as part of the outlet control device. The outlet control device may consist of a concrete structure with properly sized orifices in the front face of the structure; the overflow may consist of a beehive grate located at the top of the structure.

Inspections

The basins should be inspected semi-annually with additional inspections during the first few months after completion of the re-grading to ensure that the vegetation becomes adequately established. The basins should be inspected for slope integrity, soil moisture, vegetative health, soil stability, soil compaction, soil erosion, ponding and sedimentation. Significant ponding should be present for only a few hours following a rain event. The outlet structure should be inspected frequently (weekly or following rain events) to make sure the outlets are clear.

Routine Maintenance

Repairs and reseeding may be needed during the first few months until the vegetation becomes secure. The basin should be mowed once per year to prevent the establishment of trees and shrubs, except those specifically planted as part of the landscape plan. The mowing must be in the mid-summer when the basin is as dry as possible, and the grass clippings should be removed. The grass should not be cut shorter than 4 inches. Sediment and debris should be removed at least once per year in late spring. Other tasks include fertilizing of the side slope vegetation, liming, watering, pruning, and weed and pest control.

Debris cannot be allowed to accumulate on the outlet structure. Debris will need to be removed immediately from the outlet structure to keep the outlet orifice and overflow clear and free draining.

Non-Routine Maintenance

These are structural repairs and replacement of system components. Typical items for this BMP may include:

- Major repairs of slopes
- Repairs to the outlet structure: Repairing the inlet or outlet pipes; filling cracks in the concrete, repairing loose grout; etc.
- Removal of accumulated sediment should be performed at least every 10 years or when warranted based on the inspection.

Unified Stormwater Best Management Practice (BMP)
Annual[1] Inspection Form

Type of BMP	☐ Detention Basin/Extended Detention Basin ☐ Rain Garden/Bioretention/Tree Box Filter ☐ Underground Detention (e.g., StormCeptor) ☐ Infiltration Basin/Retention Pond ☐ Leaching Catch Basin ☐ Other _____
BMP ID Number (e.g., DET-1, CB-3247)	
BMP Location/Street Address	
Inspector Name	
Date of Inspection	
Rain or Significant Snowmelt in Last 24 Hours	☐ Yes ☐ No

Considerations	Observations	Maintenance/Repair Needs
Floatables (e.g., litter) in BMP	☐ Not Present or Minimal ☐ Apparent Littering ☐ Apparent Dumping	☐ General Cleaning ☐ Major Cleaning ☐ Public Education ☐ Consider Enforcement
Sedimentation/Floatables in Forebay, Pretreatment Unit or on BMP	☐ Minimal (< 20% of sump) ☐ At Capacity (20 - 50% of sump) ☐ Excessive (>50% of sump)	☐ Minor Cleaning ☐ Major Cleaning ☐ Scarify and Replant Bottom ☐ Vacuuming (if permeable pavement)
Sidewall/Slope Damage (provide photo and approximate location)	☐ Minor ☐ Significant ☐ Apparent Structural Failure	☐ Soil/Slope Repair ☐ Concrete/Masonry Repair ☐ Riprap Repair
Inlet/Outlet Obstructions (e.g., clogging, damage)	☐ Clogging ☐ Collapsed or Crushed ☐ Masonry/Riprap Damage	☐ Unclogging ☐ Pipe Repair ☐ Masonry Repair ☐ Riprap Repair
Standing Water Above the Invert (i.e., bottom of the outlet pipe)	☐ Not Present ☐ Present but Minimal ☐ Significant Backup ☐ Mosquitos/Larvae	☐ Minor Cleaning ☐ Major Cleaning ☐ Mosquito Treatment
Ponding of Filtration/Infiltration Bed/Permeable Pavement	☐ Not Present ☐ Present but Minimal ☐ Significant Backup ☐ Biological Growth ☐ Mosquitos	☐ Minor Cleaning ☐ Major Cleaning ☐ Mosquito Treatment ☐ Filter Bed Replacement
Vegetation Quality Invasive Plant Growth (if present provide photo)	☐ Overgrowth (e.g., grass >6") ☐ Dead, Diseased or Broken ☐ Bare Areas ☐ Invasive Plants (minor) ☐ Invasive Plants (major)	☐ Mowing ☐ Pruning ☐ Repair/Replacement ☐ Invasive Plant Removal ☐ Mulching ☐ Reseeding
Other?		
Urgency		☐ Urgent ☐ Immediate but not Urgent

[1] If possible, conduct semi-annual inspections in spring and fall to observe for presence of litter and leaf debris

APPENDIX L

2016 MS4 Annual Reports

Year 1 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: May 1, 2018-June 30, 2019

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed.

Part I: Contact Information

Name of Municipality or Organization: City of Revere

EPA NPDES Permit Number: MAR041057

Primary MS4 Program Manager Contact Information

Name: Nicholas Rystrom Title: City Engineer

Street Address Line 1: 281 Broadway

Street Address Line 2: na

City: Revere State: MA Zip Code: 02151

Email: nrystrom@revere.org Phone Number: (781) 286-8153

Fax Number: na

Stormwater Management Program (SWMP) Information

SWMP Location (web address): https://www.revere.org/departments/engineering

Date SWMP was Last Updated: June 28,2019

If the SWMP is not available on the web please provide the physical address and an explanation of why it is not posted on the web:

Part II: Self Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4.

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☒ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☐ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. ***By checking each box you are certifying that you have completed that permit requirement fully.*** *If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Year 1 Requirements

- ☒ Develop and begin public education and outreach program
- ☒ Identify and develop inventory of all known locations where SSOs have discharged to the MS4 in the last 5 years
  - ◉ The SSO inventory is attached to the email submission
  - ○ The SSO inventory can be found at the following website:
- ☒ Develop written IDDE plan including a procedure for screening and sampling outfalls
- ☒ IDDE ordinance complete
- ☒ Identify each outfall and interconnection discharging from MS4, classify into the relevant category, and priority rank each catchment for investigation
  - ◉ The priority ranking of outfalls/interconnections is attached to the email submission
  - ○ The priority ranking of outfalls/interconnections can be found at the following website:
- ☒ Construction/ Erosion and Sediment Control (ESC) ordinance complete
- ☒ Develop written procedures for site inspections and enforcement of sediment and erosion control measures
- ☒ Develop written procedures for site plan review
- ☒ Keep a log of catch basins cleaned or inspected
- ☐ Complete inspection of all stormwater treatment structures

Annual Requirements

- ☒ Annual opportunity for public participation in review and implementation of SWMP
- ☒ Comply with State Public Notice requirements
- ☒ Keep records relating to the permit available for 5 years and make available to the public
- ☒ Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- ☐ Annual training to employees involved in IDDE program
- ☒ All curbed roadways have been swept a minimum of one time per year

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- ☐ Annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☐ Permittee or its agents disseminate educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- ☐ Provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

- ☒ Increase street sweeping frequency of all municipal owned streets and parking lots to a schedule to target areas with potential for high pollutant loads
- ☒ Prioritize inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings

Use the box below to input additional details on any unchecked boxes above or any additional information you would like to share as part of your self assessment:

The priority ranking of each outfall has been completed according the criteria outlined in the 2015 Supplemental Comprehensive Wastewater Management Plan/ Comprehensive Stormwater Management Plan (CWMP/CSMP).

The City of Revere does not have any stormwater treatment structures.

The City has planned public education for bacteria impairments for year 2 of the permit.

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

Yes ☒ No ☐

If yes, describe below, including any relevant impairments or TMDLs:

Changes have been made to the list of receiving waters and outfalls as additional data has been collected regarding outfall jurisdiction, outfall discharge location, and drainage system configuration as part of a comprehensive drainage mapping effort. No new applicable impairments or TMDLs have been identified as part of this effort. The list of outfalls, receiving waters, and impairments that is included in the City's Stormwater Management Plan is being updated to reflect these changes.

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed during the reporting period: 1

Below, report on the educational messages completed during the first year. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.

BMP:Stormwater Education Video

Message Description and Distribution Method:

Educational stormwater pollution video created by the Mystic River Watershed.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

Track the number of views on the website. The total number of views was 54.

Message Date(s): September 17, 2019

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ☒ No ☐

If yes, describe why the change was made:

This video was provided by the Mystic River Watershed Association (MyRWA). The City of Revere continues to collaborate with the association and posts material provided.

BMP:Press Release and Socail Media Post on Proper Management of Private Parking Lots

Message Description and Distribution Method:

Social media post to City's Facebook page on the importance of sweeping private parking lots regularly.

Targeted Audience: Businesses, institutions and commercial facilities

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

Track the number of views on Facebook. The total number of views were 61 and 3 shares.

Message Date(s): September 13, 2019

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ☒ No ☐

If yes, describe why the change was made:

This post was provided by MyRWA. The City of Revere continues to collaborate with the association and posts material provided.

BMP: Social Media Post

Message Description and Distribution Method:

Proper use of fertilizer.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

Track the number of views. Total number of views 29.

Message Date(s): September 26, 2019

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ☐ No ☒

If yes, describe why the change was made:

BMP:Water & Sewer Outreach

Message Description and Distribution Method:

Revere DPW and MyRWA outreach to 2nd-5th grade classrooms on Stormwater Pollution

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

Track the number of classrooms that participated in the outreach.
5th grade - 3 classrooms
4th grade - 4 classrooms

3rd grade - 4 classrooms
2nd grade - 4 classrooms

Message Date(s): 5/30/2019; 6/10/2019; 9/10/2019; 2/7/2019

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ☒ No ☐

If yes, describe why the change was made:

This was not provided in the NOI but is an integral part of the City's public education program.

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) during the reporting period:

Review of the Stormwater Management Plan was made available by posting the plan on the City's website in June 2019.

Was this opportunity different than what was proposed in your NOI? Yes ☐ No ☒

Describe any other public involvement or participation opportunities conducted during the reporting period:

The City holds bi-weekly hazardous waste days at which residents can drop off residential household waste products, including, but not limited to, car batteries, paint, waste oil, and electronics. During this reporting period, residents disposed of more than 25 tons of waste materials.

The City provides stormwater plaques for the public to install, approximately 300 were installed this year.

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Below, report on the number of SSOs identified in the MS4 system and removed during this reporting period.

Number of SSOs identified: 22

Number of SSOs removed: 22

Below, report on the total number of SSOs identified in the MS4 system and removed to date. At a minimum, report SSOs identified since 2013.

Total number of SSOs identified: 151

Total number of SSOs removed: 151

MS4 System Mapping

Describe the status of your MS4 map, including any progress made during the reporting period:

The City has a comprehensive map of the drainage system, including outfalls, pipes, manholes, and catch basins. The map is updated annually to capture any modifications to the system through projects or findings in the field.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses.

- (●) The outfall screening data is attached to the email submission
- ( ) The outfall screening data can be found at the following website:

Below, report on the number of outfalls/interconnections screened during this reporting period.

Number of outfalls screened: 25

Below, report on the percent of total outfalls/ interconnections screened to date.

Percent of total outfalls screened: 100%

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- ( ) The catchment investigation data is attached to the email submission
- (●) The catchment investigation data can be found at the following website:

Catchment investigations are performed during outfall monitoring.

Below, report on the number of catchment investigations completed during this reporting period.

Number of catchment investigations completed this reporting period:

Below, report on the percent of catchments investigated to date.

Percent of total catchments investigated:

Optional: Provide any additional information for clarity regarding the catchment investigations below:

From 2006-2017, the City of Revere monitored 100% of its known outfalls during both wet-weather and dry-weather events each year. Observed flow has been analyzed for ammonia-nitrogen, Escherichia coliform, Enterococcus, and surfactants (MBAS).

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- ○ The illicit discharge removal report is attached to the email submission
- ◉ The illicit discharge removal report can be found at the following website:

The City does not have illicit discharge reports available.

Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed during this reporting period.

Number of illicit discharges identified: 1

Number of illicit discharges removed: 1

Estimated volume of sewage removed: 330 gpd

Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed since the effective date of the permit.

Total number of illicit discharges identified: 55

Total number of illicit discharges removed: 55

Optional: Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

Employee Training

Describe the frequency and type of employee training conducted during the reporting period:

The City of Revere plans to hold annual employee training. The training scheduled for this reporting period was rescheduled to October 31, 2019, due to Department of Public Works (DPW) field emergency.

MCM4: Construction Site Stormwater Runoff Control

Below, report on the construction site plan reviews, inspections, and enforcement actions completed during this reporting period.

Number of site plan reviews completed: 0

Number of inspections completed: 0

Number of enforcement actions taken: 0

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance Development

Describe the status of the post-construction ordinance required to be complete in year 2 of the permit term:

The City of Revere has a Stormwater Management Ordinance which covers post-construction requirements including language about Low Impact Development (LID), BMP design guidance, submission of as-builts, and long-term O&M. Revere will seek to include more detailed language in their Ordinance to meet the requirements of the new permit in FY2020.

As-built Drawings

Describe the status of the measures the MS4 has utilized to require the submission of as-built drawings and ensure long term operation and maintenance of completed construction sites required to be complete in year 2 of the permit term:

The City will require the submission of as-built plans for completed projects. This will be implemented and completed by year 2 of the effective date of the permit.

Street Design and Parking Lots Report

Describe the status of the street design and parking lots assessment due in year 4 of the permit term, including any planned or completed changes to local regulations and guidelines:

The City will develop a report assessing requirements that affect the creation of impervious cover. The assessment will help the City determine if changes to design standards for streets and parking lots can be modified to support low impact design options. This will be completed 4 years after the effective date of the permit.

Green Infrastructure Report

Describe the status of the green infrastructure report due in year 4 of the permit term, including the findings and progress towards making the practice allowable:

The City will develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist. This will be completed 4 years after the effective date of the permit.

Retrofit Properties Inventory

Describe the status of the inventory, due in year 4 of the permit term, of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

The City is aware of this requirement but has not started the process.

MCM6: Good Housekeeping

Catch Basin Cleaning

Describe the status of the catch basin cleaning optimization plan:

See additional information below.

If complete, attach the catch basin cleaning optimization plan or the schedule to gather information to develop the optimization plan:

- ○ The catch basin cleaning optimization plan or schedule is attached to the email submission
- ○ The catch basin cleaning optimization plan or schedule can be found at the following website:

Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins during this reporting period.

Number of catch basins inspected: 1464

Number of catch basins cleaned: 1464

Total volume or mass of material removed from all catch basins: 973.88 CY

Below, report on the total number of catch basins in the MS4 system, if known.

Total number of catch basins: 4137

If applicable:

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

Street Sweeping

Describe the status of the written procedures for sweeping streets and municipal-owned lots:

The City sweeps every street once per month April through November.

Report on street sweeping completed during the reporting period using one of the three metrics below.

- (●) Number of miles cleaned: 800
- ( ) Volume of material removed: [UNITS]
- ( ) Weight of material removed: [UNITS]

If applicable:

For rural uncurbed roadways with no catch basins, describe the progress of the inspection, documentation, and targeted sweeping plan:

N/A

Winter Road Maintenance

Describe the status of the written procedures for winter road maintenance including the storage of salt and sand:

The City of Revere has established written procedures that can be found in Appendix I of their Stormwater Management Plan (SWMP)

Inventory of Permittee-Owned Properties

Describe the status of the inventory, due in year 2 of the permit term, of permittee-owned properties, including parks and open spaces, buildings and facilities, and vehicles and equipment, and include any updates:

The City plans to create an inventory of all permittee-owned parks and open spaces, buildings and facilities, and vehicles and equipment. This will be completed 2 years after the effective date of the permit and implemented annually.

O&M Procedures for Parks and Open Spaces, Buildings and Facilities, and Vehicles and Equipment

Describe the status of the operation and maintenance procedures, due in year 2 of the permit term, of permittee-owned properties (parks and open spaces, buildings and facilities, vehicles and equipment) and include maintenance activities associated with each:

The City will create a written O&M procedure including all requirements contained in 2.3.7.a.ii for parks and open spaces, buildings and facilities, vehicles, and equipment. This will be completed 2 years after the

effective date of the permit.

Stormwater Pollution Prevention Plan (SWPPP)

Describe the status of any SWPPP, due in year 2 of the permit term, for permittee-owned or operated facilities including maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater:

The City will create SWPPPs for maintenance garages, transfer stations, and other waste-handling facilities. This will be completed and implemented 2 years after the effective permit date.

Below, report on the number of site inspections for facilities that require a SWPPP completed during this reporting period.

Number of site inspections completed: N/A

Describe any corrective actions taken at a facility with a SWPPP:

N/A

O&M Procedures for Stormwater Treatment Structures

Describe the status of the written procedure for stormwater treatment structure maintenance:

The City of Revere does not have any stormwater treatment structures.

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- (●) Not applicable
- ( ) The results from additional reports or studies are attached to the email submission
- ( ) The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

N/A

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

The City has added a requirement to their latest catch basin cleaning contract entitled "Sewer & Stormwater Maintenance and Rehabilitation (MUN 2019-1014) executed September 2019.

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 2 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Complete system mapping Phase I
- Begin investigations of catchments associated with Problem Outfalls
- Develop or modify an ordinance or other regulatory mechanism for post-construction stormwater runoff from new development and redevelopment
- Establish and implement written procedures to require the submission of as-built drawings no later than two years after the completion of construction projects
- Develop, if not already developed, written operations and maintenance procedures
- Develop an inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; review annually and update as necessary
- Establish a written program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner
- Develop and implement a written SWPPP for maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater
- Enclose or cover storage piles of salt or piles containing salt used for deicing or other purposes
- Develop, if not already developed, written procedures for sweeping streets and municipal-owned lots
- Develop, if not already developed, written procedures for winter road maintenance including storage of salt and sand
- Develop, if not already developed, a schedule for catch basin cleaning
- Develop, if not already developed, a written procedure for stormwater treatment structure maintenance
- Develop a written catchment investigation procedure *(18 months)*

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4 in the last 5 years
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all uncurbed streets at least annually

Provide any additional details on activities planned for permit year 2 below:

Public Education
BMP: Brochures/Pamphlets of "Scoop the Poop Pledge" include with dog licenses.
BMP: Social Media Post sharing ThinkBlue Massachusetts on Facebook.
BMP: Social Media Post/Website Banner & Text of Clean Water tip: Bag compost & mulch leaves.
BMP: Brochures/Pamphlets/Webpage of pollution prevention.
BMP: Brochures/Pamphlets/Webpage about Proper Operation & Maintenance of grounds.

Part V: Certification of Small MS4 Annual Report 2019

40 CFR 144.32(d) Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name:	Nicholas J. Rystrom	Title:	City Engineer
Signature:	Nicholas Rystrom Digitally signed by Nicholas Rystrom DN: cn=Nicholas Rystrom, o=City of Revere, ou=Engineering Dept., email=nrystrom@revere.org, c=US Date: 2019.10.01 09:20:54 -04'00'	Date:	10/01/19

[Signatory may be a duly authorized representative]

Year 2 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2019-June 30, 2020

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2019 and June 30, 2020 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization: City of Revere

EPA NPDES Permit Number: MAR041057

Primary MS4 Program Manager Contact Information

Name: Nicholas Rystrom Title: City Engineer

Street Address Line 1: 281 Broadway

Street Address Line 2:

City: Revere State: MA Zip Code: 02151

Email: nrystrom@revere.org Phone Number: (781) 286-8153

Stormwater Management Program (SWMP) Information

SWMP Location (web address): https://www.revere.org/departments/engineering

Date SWMP was Last Updated: June 2019

If the SWMP is not available on the web please provide the physical address:

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☒ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☐ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. ***By checking each box you are certifying that you have completed that permit requirement fully.*** *If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Year 2 Requirements

- ☒ Completed Phase I of system mapping
- ☒ Developed a written catchment investigation procedure and added the procedure to the SWMP
- ☒ Developed written procedures to require the submission of as-built drawings and ensure the long term operation and maintenance of completed construction sites and added these procedures to the SWMP
- ☒ Enclosed or covered storage piles of salt or piles containing salt used for deicing or other purposes
- ☐ Developed written operations and maintenance procedures for parks and open space, buildings and facilities, and vehicles and equipment and added these procedures to the SWMP
- ☒ Developed an inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment and added this inventory to the SWMP
- ☒ Completed a written program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- ☐ Developed written SWPPPs, included in the SWMP, for all of the following permittee owned or operated facilities: maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above year 2 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

A salt shed is present at the Revere DPW Facility, though it is in need of repairs which are being addressed in the ongoing site update project.

Written O&M procedures were developed in September 2020 and added to the SWMP. Draft SWMP updates are ongoing.

A draft SWPPP was completed in September 2020 for the City's DPW Facility.

Annual Requirements

- ☒ Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements
- ☒ Kept records relating to the permit available for 5 years and made available to the public
- ☐ The SSO inventory has been updated, including the status of mitigation and corrective measures implemented
  - ○ This is not applicable because we do not have sanitary sewer
  - ◉ This is not applicable because we did not find any new SSOs
  - ○ The updated SSO inventory is attached to the email submission
  - ○ The updated SSO inventory can be found at the following website:
- ☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- ☐ Provided training to employees involved in IDDE program within the reporting period
- ☒ All curbed roadways were swept at least once within the reporting period
- ☒ Updated outfall and interconnection inventory and priority ranking as needed

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above annual requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

IDDE Training was delayed due to COVID-19, though the training is scheduled to be provided virtually beginning September 2020.

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- ☒ Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☒ Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- ☐ Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The City of Revere does not have any septic systems.

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

☒ Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads

☐ Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Revere maintains an aggressive street sweeping schedule, sweeping every street at least once every two weeks between April and November. Streets with the potential for high pollutant loads are swept more frequently - one or more times per week.

The City has included a requirement in the contract with the catch basin cleaning contractor to take measurements such that a catch basin optimization plan can be developed. The contractor has not provided these measurements to the City. Revere has reiterated the importance of these measurements to the contractor.

Optional: Use the box below to provide any additional information you would like to share as part of your self-assessment:

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- (●) Yes
- ( ) No

If yes, describe below, including any relevant impairments or TMDLs:

As noted in the Year 1 Annual Report, changes have been made to the list of receiving waters and outfalls as additional data has been collected regarding outfall jurisdiction, outfall discharge location, and drainage system configuration as part of a comprehensive drainage mapping effort. No new applicable impairments or TMDLs have been identified as part of this effort. The list of outfalls, receiving waters, and impairments that is included in the City's Stormwater Management Plan has been and will continue to be updated to reflect these changes.

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed **during this reporting period**: 2

*Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.*

BMP:Brochure/Pamphlet

Message Description and Distribution Method:

"Scoop the poop" pledge included with dog licenses.

Targeted Audience: Residents

Responsible Department/Parties: Engineering/ External Contractor

Measurable Goal(s):

Track brochures distributed.

Message Date(s): Continuous

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Water and Sewer Outreach

Message Description and Distribution Method:

Revere DPW and MyRWA outreach to elementary classrooms on Stormwater Pollution

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

All 4th grade students at the Whalen School

Message Date(s): 9/9/2019

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ◉ No ○

If yes, describe why the change was made:

This was not provided in the NOI but is an integral part of the City's public education program.

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period**:

The SWMP has been made available online, on the City's website since June 2019.

Was this opportunity different than what was proposed in your NOI? Yes ○ No ◉

Describe any other public involvement or participation opportunities conducted **during this reporting period**:

The City holds bi-weekly hazardous waste days at which residents can drop off residential household waste products, including, but not limited to, car batteries, paint, waste oil, and electronics.

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

☐ This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period**.*

Number of SSOs identified: 0

Number of SSOs removed: 0

MS4 System Mapping

Below, check all that apply.

The following elements of the Phase I map have been completed:

- ☒ Outfalls and receiving waters
- ☐ Open channel conveyances
- ☒ Interconnections
- ☐ Municipally-owned stormwater treatment structures
- ☒ Waterbodies identified by name and indication of all use impairments
- ☒ Initial catchment delineations

Optional: Describe any additional progress you made on your map during this reporting period or provide additional status information regarding your map:

The City has a comprehensive map of the drainage system, including outfalls, pipes, manholes, and catch basins. The map is update annual to capture any modifications to the system through projects or findings in the field. Revere has no open channel conveyances or municipally-owned stormwater treatment structures.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses.

- ◉ The outfall screening data is attached to the email submission
- ○ The outfall screening data can be found at the following website:

*Below, report on the number of outfalls/interconnections screened **during this reporting period**.*

Number of outfalls screened: 25

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- ○ The catchment investigation data is attached to the email submission
- ◉ The catchment investigation data can be found at the following website:

Catchment investigations are performed during outfall monitoring.

*Below, report on the number of catchment investigations completed **during this reporting period**.*

Number of catchment investigations completed this reporting period: 0

*Below, report on the percent of catchments investigated **to date.***

Percent of total catchments investigated: 0

Optional: Provide any additional information for clarity regarding the catchment investigations below:

From 2006-2017, the City of Revere monitored 100% of its known outfalls during both wet-weather and dry-weather events each year. Observed flow has been analyzed for ammonia-N, E.coli, enterococcus, and surfactancts (MBAS).

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- ○ The illicit discharge removal report is attached to the email submission
- ◉ The illicit discharge removal report can be found at the following website:

The City does not have illicit discharge reports available.

*Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed **during this reporting period.***

Number of illicit discharges identified: 0

Number of illicit discharges removed: 0

Estimated volume of sewage removed: 0 gallons/day

*Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed **since the effective date of the permit (July 1, 2018)**.*

Total number of illicit discharges identified: 55

Total number of illicit discharges removed: 55

Optional: Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

55 illicit discharges identified and removed to date; no new illicit discharges we identified during Year 2.

Employee Training

Describe the frequency and type of employee training conducted **during the reporting period**:

The City of Revere was unable to hold in-person training during the permit year due to COVID-19. Virtual Training is planned for September 2020.

MCM4: Construction Site Stormwater Runoff Control

*Below, report on the construction site plan reviews, inspections, and enforcement actions completed **during this reporting period**.*

Number of site plan reviews completed: 0

Number of inspections completed: 0

Number of enforcement actions taken: 0

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

The number of site plan reviews is unknown at this time, but are required for construction projects in the City.

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Below, select the option that describes your ordinance or regulatory mechanism progress.

- ○ Bylaw, ordinance, or regulations are updated and adopted consistent with permit requirements
- ◉ Bylaw, ordinance, or regulations are updated consistent with permit requirements but are not yet adopted
- ○ Bylaw, ordinance, or regulations have not been updated or adopted

As-built Drawings

Describe the measures the MS4 has utilized to require the submission of as-built drawings and ensure long term operation and maintenance of completed construction sites:

Revere's Site Plan Review procedures require that as-built plans be submitted to the building inspector before he may issue a permanent occupancy permit. An Operation and Maintenance Schedule is required as part of the Stormwater Management Permit as specified in Revere's Chapter 13.10 Stormwater Management Ordinance.

Street Design and Parking Lots Report

Describe the status of the street design and parking lots assessment due in year 4 of the permit term, including any planned or completed changes to local regulations and guidelines:

The City will develop a report assessing requirements that affect the creation of impervious cover. The assessment will help the City determine if changes to design standards for streets and parking lots can be modified to support low impact design options. This will be completed 4 years after the effective date of the permit.

Green Infrastructure Report

Describe the status of the green infrastructure report due in year 4 of the permit term, including the findings and progress towards making the practice allowable:

The City will develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist. This will be completed 4 years after the effective date of the permit.

Retrofit Properties Inventory

Describe the status of the inventory, due in year 4 of the permit term, of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

The City is aware of this requirement but has not started the process.

MCM6: Good Housekeeping

Catch Basin Cleaning

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins **during this reporting period**.*

Number of catch basins inspected: 54

Number of catch basins cleaned: 54

Total volume or mass of material removed from all catch basins: 45 cubic yards

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins: 4,137

If applicable:

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

If a catch basin sump is more than 50 percent full during two consecutive inspections, Revere will document the findings, investigate the contributing drainage area for sources of excessive sediment loading, and, if possible, address the contributing sources. If no contributing sources are found, it will increase the inspection and cleaning frequencies of the sump.

Street Sweeping

*Report on street sweeping completed **during this reporting period** using one of the three metrics below.*

- (•) Number of miles cleaned: 800
- ( ) Volume of material removed: [ ] [Select Units]
- ( ) Weight of material removed: [ ] [Select Units]

O&M Procedures and Inventory of Permittee-Owned Properties

Below, check all that apply.

The following permittee-owned properties have been inventoried:

- ☒ Parks and open spaces
- ☒ Buildings and facilities
- ☒ Vehicles and equipment

The following O&M procedures for permittee-owned properties have been completed:

- ☐ Parks and open spaces
- ☐ Buildings and facilities
- ☐ Vehicles and equipment

Stormwater Pollution Prevention Plan (SWPPP)

*Below, report on the number of site inspections for facilities that require a SWPPP completed **during this reporting period**.*

Number of site inspections completed: 1

Describe any corrective actions taken at a facility with a SWPPP:

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- (•) Not applicable
- ( ) The results from additional reports or studies are attached to the email submission
- ( ) The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

COVID-19 Impacts

Optional: If any of the above year 2 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

IDDE Training was delayed due to COVID-19, but virtual training has been scheduled for September 2020.

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 3 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Inspect all outfalls/ interconnections (excluding Problem and Excluded outfalls) for the presence of dry weather flow
- Complete follow-up ranking as dry weather screening becomes available

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in

connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all uncurbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary

Provide any additional details on activities planned for permit year 3 below:

Part V: Certification of Small MS4 Annual Report 2020

40 CFR 144.32(d) Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name:	Nicholas J. Rystrom, P.E.	Title:	City Engineer
Signature:	Nicholas Rystrom — Digitally signed by Nicholas Rystrom DN: cn=Nicholas Rystrom, o=City of Revere, ou=Engineering Dept., email=nrystrom@revere.org, c=US Date: 2020.09.28 18:44:33 -04'00'	Date:	09/28/20

[Signatory may be a duly authorized representative]

Note: When prompted during signing, save the document under a new file name.

Annual Report Submission

Please submit the form electronically via email to both EPA and MassDEP by clicking on one of the links below or using the email addresses listed below. Please ensure that all required attachments are included in the email and not attached to this PDF.

EPA: stormwater.reports@epa.gov MassDEP: laura.schifman@mass.gov

Paper Signature:

If you did not sign electronically above, you can print the signature page by clicking the button below.

Print Signature Page

Optional: If you did not sign electronically above, you may lock the form by clicking the "Lock Form" button below which will prompt you to save the locked version of the form. Save this locked version under a new file name.

Lock Form

Year 3 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2020-June 30, 2021

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2020 and June 30, 2021 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization: City of Revere

EPA NPDES Permit Number: MAR041057

Primary MS4 Program Manager Contact Information

Name: Nicholas Rystrom Title: City Engineer

Street Address Line 1: 281 Broadway

Street Address Line 2:

City: Revere State: MA Zip Code: 02151

Email: nrystrom@revere.org Phone Number: 781-286-8153

Stormwater Management Program (SWMP) Information

SWMP Location (web address): https://www.revere.org/departments/engineering

Date SWMP was Last Updated: Jun 30, 2019

If the SWMP is not available on the web please provide the physical address:

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☒ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☐ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. ***By checking each box you are certifying that you have completed that permit requirement fully.*** *If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Year 3 Requirements

- ☒ Inspected and screened all outfalls/interconnections (excluding Problem and Excluded outfalls)
- ☒ Updated outfall/interconnection priority ranking based on the information collected during the dry weather inspections as necessary
- ☐ Post-construction bylaw, ordinance, or other regulatory mechanism was updated and adopted consistent with permit requirements

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above year 3 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

Draft language to update Revere's Stormwater Management Bylaw to include post-construction permit requirements has been created. Finalization and adoption is planned for Permit Year 4.

Annual Requirements

- ☒ Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements
- ☒ Kept records relating to the permit available for 5 years and made available to the public
- ☐ The SSO inventory has been updated, including the status of mitigation and corrective measures implemented
  - ○ This is not applicable because we do not have sanitary sewer
  - ◉ This is not applicable because we did not find any new SSOs

- ○ The updated SSO inventory is attached to the email submission
- ○ The updated SSO inventory can be found at the following website:

- ☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- ☒ Provided training to employees involved in IDDE program within the reporting period
- ☒ All curbed roadways were swept at least once within the reporting period
- ☒ Updated system map due in year 2 as necessary
- ☒ Enclosed all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- ☒ Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- ☒ Updated inventory of all permittee owned facilities as necessary
- ☐ O&M programs for all permittee owned facilities have been completed and updated as necessary
- ☐ Implemented all maintenance procedures for permittee owned facilities in accordance with O&M programs
- ☐ Implemented program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- ☐ Inspected all permittee owned treatment structures (excluding catch basins)

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above annual requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

O&M programs for all permittee owned facilities have been drafted and implemented according to their draft versions. A O&M manual documenting these programs has been compiled and a final review of the document is ongoing.

A Stormscepter separator was installed in summer 2021. An inspection and maintenance schedule has been established for this structure beginning in Permit Year 4.

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- ☒ Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☒ Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- ☐ Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The City of Revere does not have any septic systems.

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

- ☒ Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads
- ☐ Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Revere maintains an aggressive street sweeping schedule, sweeping every street at least once every two weeks between April and November. Streets with the potential for high pollutant loads are swept more frequently - one or more times per week.

The City has included a requirement in the contract with the catch basin cleaning contractor to take measurements such that a catch basin optimization plan can be developed. The contractor has not provided these measurements to the City. Revere has reiterated the importance of these measurements to the contractor.

Optional: Use the box below to provide any additional information you would like to share as part of your self-assessment:

Draft updates to the SWMP have been completed during Permit Year 3. Final review of this document is ongoing; the updated SWMP will be available on the City's Engineering website for public access and review.

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- ○ Yes
- ◉ No

If yes, describe below, including any relevant impairments or TMDLs:

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed **during this reporting period**: 6

*Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.*

BMP:Fertilizer Social Media Post

Message Description and Distribution Method:

Fertilizer Social Media Post - "Clean Water Tip" encouraging minimization of fertilizer use and phosphorus contribution to runoff.

Targeted Audience: Residents, Business, Industry

Responsible Department/Parties: Engineering

Measurable Goal(s):

Track number of views

Message Date(s): April 7, 2021

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:[Brochure/ Pamphlet

Message Description and Distribution Method:

"Scoop the poop" pledge included with dog licenses.

Targeted Audience: Residents

Responsible Department/Parties: Engineering

Measurable Goal(s):

Track brochures distributed.

Message Date(s): Continuous

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Social Media

Message Description and Distribution Method:

CB Cleaning Social Media Post - "Clean Water Tip" explaining the importance of keeping the storm drains clean.

Targeted Audience: Residents

Responsible Department/Parties: Engineering

Measurable Goal(s):

Track number of views

Message Date(s): February 17, 2021

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Social Media

Message Description and Distribution Method:

Lawn Clippings Social Media Post - "Clean Water Tip" to keep grass clippings out of storm drains.

Targeted Audience: residents, businesses, industry

Responsible Department/Parties: Engineering

Measurable Goal(s):

Track number of views

Message Date(s): May 20, 2021

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Social Media

Message Description and Distribution Method:

Fertilizer Social Media Post - "Clean Water Tip" encouraging reuse of leaves as fertilizer.

Targeted Audience: residents, businesses, industry

Responsible Department/Parties: Engineering

Measurable Goal(s):

Track number of views

Message Date(s): October 7, 2021

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Social Media

Message Description and Distribution Method:

Porous Pavement Social Media Post - "Clean Water Tip" encouraging the use of porous pavement.

Targeted Audience: residents, businesses, industry

Responsible Department/Parties: Engineering

Measurable Goal(s):

Track number of views

Message Date(s):

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period**:

The SWMP has been made available online, on the City's website since June 2019.

Was this opportunity different than what was proposed in your NOI? Yes ○ No ◉

Describe any other public involvement or participation opportunities conducted **during this reporting period**:

The City holds bi-weekly hazardous waste days at which residents can drop off residential household waste products,. In 2021, the City collected the following:

Auto Batteries - 240 units
Tires - 9 tons
Propane Tanks- 75 units
Paint - 38 Cubic Yard Boxes
Waste Oil - 600 Gallons
Used Oil Filters 1 - 55-Gallon Drums
Thermometers - 30 units
Thermostats - 22 units
Household Batteries - 1 5-Gallon Drum
Anti-Freeze - 3 - 55-Gallon Drums
Button Batteries - .25 5-Gallon Drum
CRT's/Electronics - 125,000 LBS

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

☐ This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period**.*

Number of SSOs identified: 0

Number of SSOs removed: 0

MS4 System Mapping

Optional: Provide additional status information regarding your map:

The City has a comprehensive map of the drainage system, including outfalls, pipes, manholes, and catch basins. The map is updated annually to capture any modifications to the system through projects or findings in the field.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses. Please also include the updated inventory and ranking of outfalls/interconnections based on monitoring results.

- ○ No outfalls were inspected
- ◉ The outfall screening data is attached to the email submission
- ○ The outfall screening data can be found at the following website:

*Below, report on the number of outfalls/interconnections screened **during this reporting period**.*

Number of outfalls screened: 26

*Below, report on the percent of outfalls/interconnections screened **to date**.*

Percent of outfalls screened: 100

Optional: Provide additional information regarding your outfall/interconnection screening:

Additional outfall/interconnection screening occurs as part of annual sampling program required by separate consent decree with the state.

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- ○ No catchment investigations were conducted
- ○ The catchment investigation data is attached to the email submission
- ◉ The catchment investigation data can be found at the following website:

Catchment investigations are performed during outfall monitoring.

*Below, report on the number of catchment investigations completed **during this reporting period**.*

Number of catchment investigations completed this reporting period: 0

Below, report on the percent of catchments investigated ***to date.***

Percent of total catchments investigated: 0

Optional: Provide any additional information for clarity regarding the catchment investigations below:

From 2006-2017, the City of Revere monitored 100% of its known outfalls during both wet-weather and dry-weather events each year. Observed flow has been analyzed for ammonia-N, E.coli, enterococcus, and surfactancts (MBAS).

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- ○ No illicit discharges were found
- ○ The illicit discharge removal report is attached to the email submission
- ◉ The illicit discharge removal report can be found at the following website:

The City does not have illicit discharge reports available.

Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed ***during this reporting period.***

Number of illicit discharges identified: 0

Number of illicit discharges removed: 0

Estimated volume of sewage removed: 0 gallons/day

Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed ***since the effective date of the permit (July 1, 2018)****.*

Total number of illicit discharges identified: 55

Total number of illicit discharges removed: 55

Optional: Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

Employee Training

Describe the frequency and type of employee training conducted **during this reporting period**:

Revere has an annual training program for IDDE. In Permit Year 3, 78 employees received the training via powerpoint.

MCM4: Construction Site Stormwater Runoff Control

*Below, report on the construction site plan reviews, inspections, and enforcement actions completed **during this reporting period**.*

Number of site plan reviews completed: 60

Number of inspections completed: 1

Number of enforcement actions taken: 0

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

N/A

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

As-built Drawings

*Below, report on the number of as-built drawings received **during this reporting period**.*

Number of as-built drawings received: 44

Optional: Enter any additional information relevant to the submission of as-built drawings:

N/A

Street Design and Parking Lots Report

Describe the status of the street design and parking lots assessment due in year 4 of the permit term, including any planned or completed changes to local regulations and guidelines:

The City will develop a report assessing requirements that affect the creation of impervious cover. The assessment will help the City determine if changes to design standards for streets and parking lots can be modified to support low impact design options. This will be completed 4 years after the effective date of the permit.

Green Infrastructure Report

Describe the status of the green infrastructure report due in year 4 of the permit term, including the findings and progress towards making the practice allowable:

The City will develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist. This will be completed 4 years after the effective date of the permit.

Retrofit Properties Inventory

Describe the status of the inventory, due in year 4 of the permit term, of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

The City will develop an inventory of permitee-owned properties with the potential for retrofit or modification to incorporate BMPs which mitigate impervious areas. This will be completed 4 years after the effective date of the permit.

MCM6: Good Housekeeping

Catch Basin Cleaning

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins **during this reporting period**.*

Number of catch basins inspected: 494

Number of catch basins cleaned: 494

Total volume or mass of material removed from all catch basins: 154 cubic yards

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins: 4,148

If applicable:

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

If a catch basin sump is more than 50 percent full during two consecutive inspections, Revere will document the findings, investigate the contributing drainage area for sources of excessive sediment loading, and, if possible, address the contributing sources. If no contributing sources are found, it will increase the inspection and cleaning frequencies of the

Street Sweeping

*Report on street sweeping completed **during this reporting period** using one of the three metrics below.*

- ○ Number of miles cleaned:
- ○ Volume of material removed: [Select Units]
- ◉ Weight of material removed: 300 tons

Stormwater Pollution Prevention Plan (SWPPP)

Below, report on the number of site inspections for facilities that require a SWPPP completed ***during this reporting period****.*

Number of site inspections completed: 0

Describe any corrective actions taken at a facility with a SWPPP:

N/A

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- ◉ Not applicable
- ○ The results from additional reports or studies are attached to the email submission
- ○ The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

N/A

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

N/A

COVID-19 Impacts

Optional: If any of the above year 3 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

N/A

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 4 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Develop a report assessing current street design and parking lot guidelines and other local requirements within the municipality that affect the creation of impervious cover
- Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist
- Identify a minimum of 5 permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious areas

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all curbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities

- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary
- Review O&M programs for all permittee owned facilities; update if necessary
- Implement all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implement program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Enclose all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- Review as-built drawings for new and redevelopment to ensure compliance with post construction bylaws, regulations, or regulatory mechanism consistent with permit requirements
- Inspect all permittee owned treatment structures (excluding catch basins)

Provide any additional details on activities planned for permit year 4 below:

N/A

Part V: Certification of Small MS4 Annual Report 2021

40 CFR 144.32(d) Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name:	Nicholas J. Rystrom, P.E.	Title:	City Engineer
Signature:	Nicholas J Rystrom Digitally signed by Nicholas J Rystrom DN: cn=Nicholas J Rystrom, o=City of Revere, ou=Engineering Department, email=nrystrom@revere.org, c=US Date: 2021.10.04 12:08:58 -04'00'	Date:	10/04/21

[Signatory may be a duly authorized representative]

Year 4 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2021-June 30, 2022

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2021 and June 30, 2022 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization: City of Revere

EPA NPDES Permit Number: MAR041057

Primary MS4 Program Manager Contact Information

Name: Nicholas Rystrom Title: City Engineer

Street Address Line 1: 281 Broadway

Street Address Line 2:

City: Revere State: MA Zip Code: 02151

Email: nrystrom@revere.org Phone Number: 781-286-8153

Stormwater Management Program (SWMP) Information

SWMP Location (web address): https://www.revere.org/departments/engineering

Date SWMP was Last Updated: September 28, 2021

If the SWMP is not available on the web please provide the physical address:

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☒ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☐ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. ***By checking each box you are certifying that you have completed that permit requirement fully.*** *If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Year 4 Requirements

☒ Developed a report assessing current street design and parking lot guidelines and other local requirements within the municipality that affect the creation of impervious cover, made it available as part of the SWMP, and:

- ○ No updates were recommended
- ◉ Updates were recommended. The anticipated date or date of completion for updates is/was:

Expected to be by 2032, pending results of local review and approval processes.

☒ Developed a report assessing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist, made it available as part of the SWMP, and:

- ○ No updates were recommended
- ◉ Updates were recommended. The anticipated date or date of completion for updates is/was:

Expected to be by 2032, pending results of local review and approval processes.

☒ Identified a minimum of 5 permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious cover

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide an update on previous incomplete milestones, or provide any additional details, please use the box below:

Annual Requirements

- ☒ Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements
- ☒ Kept records relating to the permit available for 5 years and made available to the public
- ☒ The SSO inventory has been updated, including the status of mitigation and corrective measures implemented
  - ○ This is not applicable because we do not have sanitary sewer
  - ○ This is not applicable because we did not find any new SSOs
  - ◉ The updated SSO inventory is attached to the email submission
  - ○ The updated SSO inventory can be found at the following website:
- ☒ Updated system map due in year 2 as necessary
- ☐ Provided training to employees involved in IDDE program within the reporting period
- ☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- ☒ All curbed roadways were swept at least once within the reporting period
- ☐ Enclosed all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- ☒ Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- ☒ Updated inventory of all permittee owned facilities as necessary
- ☒ O&M programs for all permittee owned facilities have been completed and updated as necessary
- ☒ Implemented all maintenance procedures for permittee owned facilities in accordance with O&M programs
- ☒ Implemented program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- ☐ Inspected all permittee owned treatment structures (excluding catch basins)

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The City of Revere maintains two (2) stormcepters on a bi-annual basis. The stormcepters are scheduled to be maintained during the next reporting period.

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- ☒ Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☐ Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time

☐ Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Educational information on dog waste and surface water quality is provided on the City's website at: https://cdn.branchcms.com/GB7r14nbKy-1182/docs/Tri-Fold-Pet-Waste-Flyer.pdf In previous permit years the City has distributed messaging during annual dog license renewal but it was not distributed in FY22. The City plans to provide the brochure during the FY23 renewals.

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

☒ Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads

- ○ The street sweeping schedule is attached to the email submission
- ◉ The street sweeping schedule can be found at the following website:

https://www.revere.org/street-sweeping

☒ Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Revere maintains an aggressive street sweeping schedule, sweeping every street at least once every two weeks between April and November.

Optional: Use the box below to provide any additional information you would like to share as part of your self-assessment:

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- ○ Yes
- ◉ No

If yes, describe below, including any relevant impairments or TMDLs:

The City has reviewed the Final 2018/2020 Integrated List of Waters and determined there is no change to impairments during Permit Year 4. There were also no changes to receiving waterbodies or outfalls during Permit Year 4.

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed **during this reporting period**: 1

*Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.*

BMP:[Salt & De-icer]

Message Description and Distribution Method:

When the snow melts where do you think all the sale and de-icer goes? You got it! It flows into our storm drains and straight into our waterways. Keep those chemicals out of our water - shovel first, use de-icer instead of salt, and use de-icer sparingly!
Message distributed through social media post

Targeted Audience: Residents

Responsible Department/Parties: Engineering

Measurable Goal(s):

Number of page views.

Message Date(s): February 2, 2022

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period**:

The SWMP has been made available online, on the City's website since June 2019. The most recent version is posted online.

Was this opportunity different than what was proposed in your NOI? Yes ○ No ◉

Describe any other public involvement or participation opportunities conducted **during this reporting period**:

The City holds bi-weekly hazardous waste days at which residents can drop off residential household waste products,. In 2022, the City collected the following:

Auto Batteries - 125 units
Tires - 9 tons
Propane Tanks- 70 units
Paint - 32 Cubic Yard Boxes
Waste Oil - 610 Gallons
Thermometers - 42 units
Thermostats - 18 units
Household Batteries - 1 5-Gallon Pail
Anti-Freeze - 1 - 55-Gallon Drum
Button Batteries - .10 5-Gallon Drum
CRT's/Electronics - 85,000 LBS

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

☐ This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period**.*

Number of SSOs identified: 23

Number of SSOs removed: 23

MS4 System Mapping

Optional: Provide additional status information regarding your map:

The City has a comprehensive map of the drainage system, including outfalls, pipes, manholes, and catch basins. The map is updated annually to capture any modifications to the system through projects or findings in the field.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses. Please also include the updated inventory and ranking of outfalls/interconnections based on monitoring results.

○ No outfalls were inspected

- (●) The outfall screening data is attached to the email submission
- ( ) The outfall screening data can be found at the following website:

*Below, report on the number of outfalls/interconnections screened **during this reporting period**.*

Number of outfalls screened: 26

*Below, report on the percent of outfalls/interconnections screened **to date**.*

Percent of outfalls screened: 100

Optional: Provide additional information regarding your outfall/interconnection screening:

From 2006-2017, the City of Revere monitored 100% of its known outfalls. From 2018-2022, the City continues to monitor 25% during both wet-weather and dry-weather events each year. Observed flow has been analyzed for ammonia-N, E.coli, enterococcus, and surfactants (MBAS). Sampling under a previous permit year also included impaired water requirements in accordance with the permit.

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- ( ) No catchment investigations were conducted
- (●) The catchment investigation data is attached to the email submission
- ( ) The catchment investigation data can be found at the following website:

*Below, report on the number of catchment investigations completed **during this reporting period**.*

Number of catchment investigations completed this reporting period: 12

*Below, report on the percent of catchments investigated **to date.***

Percent of total catchments investigated: 81

Optional: Provide any additional information for clarity regarding the catchment investigations below:

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- (●) No illicit discharges were found
- ( ) The illicit discharge removal report is attached to the email submission
- ( ) The illicit discharge removal report can be found at the following website:

*Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed **during this reporting period.***

Number of illicit discharges identified: 0

Number of illicit discharges removed: 0

Estimated volume of sewage removed: 0 gallons/day

*Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed **since the effective date of the permit (July 1, 2018)**.*

Total number of illicit discharges identified: 1

Total number of illicit discharges removed: 1

Optional: Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

Employee Training

Describe the frequency and type of employee training conducted **during this reporting period**:

Employee training was provided May 7, 2021 with 83 total participants/recipients of training presentation.

MCM4: Construction Site Stormwater Runoff Control

*Below, report on the construction site plan reviews, inspections, and enforcement actions completed **during this reporting period**.*

Number of site plan reviews completed: 17

Number of inspections completed: 9

Number of enforcement actions taken: 0

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Date update was completed (due in year 3):

As-built Drawings

Below, report on the number of as-built drawings received ***during this reporting period****.*

Number of as-built drawings received: 26

Optional: Enter any additional information relevant to the submission of as-built drawings:

Retrofit Properties Inventory

Below, list the permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas (at least 5):

Beachmont Veterans Memorial School, 190 VFW Parkway (New Revere High School site), Garfield School, Gibson Park, and Central Avenue Parking Lot

MCM6: Good Housekeeping

Catch Basin Cleaning

Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins ***during this reporting period****.*

Number of catch basins inspected: 50

Number of catch basins cleaned: 328

Total volume or mass of material removed from all catch basins: 100 cubic yards

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins: 4,148

If applicable:

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

Street Sweeping

*Report on street sweeping completed **during this reporting period** using one of the three metrics below.*

- (•) Number of miles cleaned: 800
- ( ) Volume of material removed: [Select Units]
- ( ) Weight of material removed: [Select Units]

Stormwater Pollution Prevention Plan (SWPPP)

*Below, report on the number of site inspections for facilities that require a SWPPP completed **during this reporting period**.*

Number of site inspections completed: 2

Describe any corrective actions taken at a facility with a SWPPP:

No corrective actions were taken during this reporting period. The City of Revere has plans to renovate the existing Department of Public Works (DPW) building and any actions that need to be addressed will be addressed as part of the renovation.

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- ( ) Not applicable
- (•) The results from additional reports or studies are attached to the email submission
- ( ) The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

The City of Revere inspects and where applicable, samples 25% of selected city-owned outfalls during one dry-weather and one wet-weather period in accordance with the City's Department of Justice Consent Decree ("Consent Decree") and associated Illicit Discharge Detection & Elimination (IDDE) Plan.

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

COVID-19 Impacts

Optional: If any of the above year 4 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 5 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in

connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all curbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary
- Review O&M programs for all permittee owned facilities; update if necessary
- Implement all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implement program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Enclose all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- Review as-built drawings for new and redevelopment to ensure compliance with post construction bylaws, regulations, or regulatory mechanism consistent with permit requirements
- Inspect all permittee owned treatment structures (excluding catch basins)
- Identify additional permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious areas so that the permittee maintains a minimum of 5 sites in their inventory, until such a time when the permittee has less than 5 sites remaining

Provide any additional details on activities planned for permit year 5 below:

Part V: Certification of Small MS4 Annual Report 2021

40 CFR 144.32(d) Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Nicholas Rystrom Title: City Engineer

Signature: NJ Rystrom Date: 10/12/22

[Signatory may be a duly authorized representative]

Year 5 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2022-June 30, 2023

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form. Also ensure any websites included on this form are to publicly accessible sites

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2022 and June 30, 2023 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization: City of Revere

EPA NPDES Permit Number: MAR041057

Primary MS4 Program Manager Contact Information

Name: Nicholas Rystrom Title: City Engineer

Street Address Line 1: 281 Broadway

Street Address Line 2:

City: Revere State: MA Zip Code: 02151

Email: nrystrom@revere.org Phone Number: (781) 286-8153

Stormwater Management Program (SWMP) Information

SWMP Location (publicly available web address): https://www.revere.org/departments/engineering#resources

Date SWMP was Last Updated: September 2023

If the SWMP is not available on the web please provide the physical address:

The City is currently working to update their SWMP, and the updated version will be posted on the City's website.

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☒ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☐ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. ***By checking each box you are certifying that you have completed that permit requirement fully.*** *If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Annual Requirements

☒ Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements

☒ Kept records relating to the permit available for 5 years and made available to the public

☒ The SSO inventory has been updated, including the status of mitigation and corrective measures implemented

- ○ This is not applicable because we do not have sanitary sewer
- ○ This is not applicable because we did not find any new SSOs
- ○ The updated SSO inventory is attached to the email submission
- ◉ The updated SSO inventory can be found at the following publicly available website:

https://www.revere.org/departments/engineering

☒ Updated system map due in year 2 as necessary

☒ Provided training to employees involved in IDDE program within the reporting period

☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters

☒ All curbed roadways were swept at least once within the reporting period

☒ Enclosed all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt

☒ Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities

☒ Updated inventory of all permittee owned facilities as necessary

☒ O&M programs for all permittee owned facilities have been completed and updated as necessary

☒ Implemented all maintenance procedures for permittee owned facilities in accordance with O&M programs

☒ Implemented program for MS4 infrastructure maintenance to reduce the discharge of pollutants

☒ Inspected all permittee owned treatment structures (excluding catch basins)

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

☐ Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate

☒ Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time

☐ Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

☒ This is not applicable because there are no septic systems present

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The City of Revere does not have any septic systems.

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

☒ Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads

○ The street sweeping schedule is attached to the email submission

◉ The street sweeping schedule can be found at the following publicly available website:

https://www.revere.org/departments/public-works#trash-yard-waste

☒ Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Revere maintains an aggressive street sweeping schedule, sweeping every street at least once every two weeks between April and November. Streets with the potential for higher loads are swept more frequently - one or more times per week.

Optional: Use the box below to provide any additional information you would like to share as part of your self-assessment:

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- ○ Yes
- ◉ No

If yes, describe below, including any relevant impairments or TMDLs:

The City has made changes to its list of impairments since the NOI was filed. These changes have come as a result of updates to the Massachusetts Integrated List of Waters.

The Final 2022 Integrated List of Waters included the addition of Enterococcus impairments to Segment MA71-14 of the Belle Isle Inlet and Segment MA71-08 of Mill Creek. There is an approved TMDL for the Mystic River Watershed.

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed **during this reporting period**: 5

*Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.*

BMP: Bag Your Leaves Message

Message Description and Distribution Method:

The City website features an educational message about the importance of bagging leaves to prevent blocked storm drains and water pollution, as well as steps residents can take to properly dispose of their leaf waste.
https://www.revere.org/departments/engineering#mvp

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

Track number of views

Message Date(s): Ongoing through Reporting Period 5

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Diamond Creek Brochure

Message Description and Distribution Method:

The City developed a brochure for the Diamond Creek Catchment Improvements Investigation and Assessment Project to share information to residents regarding the goals of the project and steps the City is taking towards those goals. The brochure featured the impacts of climate vulnerability on Revere, as well as the purposes and benefits of nature based solutions. The brochure also included a QR code connecting to a feedback survey, where residents could comment on their experiences with flooding and stormwater management in Revere. The brochure and survey links are posted to the City's website as well as the City's Facebook page.
https://www.revere.org/departments/engineering#mvp
https://www.facebook.com/CityofRevere/

Targeted Audience: Residents

Responsible Department/Parties: Engineering

Measurable Goal(s):

Track number of survey responses.

Message Date(s): Ongoing through Permit Year 5.

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Diamond Creek Storyboard and Video

Message Description and Distribution Method:

The City of Revere developed a comprehensive story map and video to share information about the Diamond Creek Catchment Improvement Investigation and Assessment Project. The storyboard includes information about the purpose of the project, potential nature-based solutions, and interactive flood projection maps. The story map and video are posted to the City's website.
https://www.revere.org/departments/engineering#mvp

Targeted Audience: Residents

Responsible Department/Parties: Engineering

Measurable Goal(s):

Track viewership.

Message Date(s): Posted June 27, 2023 and ongoing through Permit Year 5.

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Think Blue Massachusetts

Message Description and Distribution Method:

The City posted Massachusetts's Think Blue video campaign to the City website and Facebook page, encouraging resident to be mindful about how pollutants from their property may affect stormwater runoff and

local water quality.
https://www.revere.org/departments/engineering#mvp

Targeted Audience: Residents

Responsible Department/Parties: Engineering

Measurable Goal(s):

Track number of views.

Message Date(s): Ongoing through Permit Year 5

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Scoop the Poop Brochure

Message Description and Distribution Method:

The City of Revere distributed Scoop the Poop brochures with dog licenses to new pet owners, encouraging owners to properly dispose of their pet's waste.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

Number of brochures distributed.

Message Date(s): Ongoing through Permit Year 5

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period**:

The City's most recent SWMP, dated June 2019, is available on their website. The City is in the process of updating their Stormwater Management Plan, and the updated version will be uploaded to the City's website upon completion.

Was this opportunity different than what was proposed in your NOI? Yes ○ No ◉

Describe any other public involvement or participation opportunities conducted **during this reporting period**:

Diamond Creek Catchment Improvements Investigation and Assessment Project Public Workshop
Event Date: June 7, 2023, 5:00 pm to 7:00 pm
Council Chambers, Revere City Hall
The City hosted this public workshop to help inform residents about the impacts of climate change on storm events and flooding in Revere. A presentation was shown to attendees, which included relevant local impacts and mitigation strategies for flooding as well as feedback opportunities.

Revere Kite Festival Tabling Event
Event Date: May 20, 2023, 10:00 am to 1:00 pm
Revere Beach Boulevard
At the 8th Annual Revere Beach Kite Festival, the City of Revere hosted a table with information regarding the Diamond Creek Catchment Improvement Investigation and Assessment Project, and a coastal resilience activity from the Stone Living Laboratory. Residents had the opportunity to ask questions about and provide feedback on the Diamond Creek Project and learn about the impacts of increasing storm intensity on local beaches.

Hazardous Waste Collections Days
Event Date: Bi-weekly through Permit Year 5
Revere High School Parking Lot
During Hazardous Waste Collections Days, the City accepted electronic and appliances, batteries, mercury products, waste oils, chemical cleaners, pesticides, paint, tires, and other hazardous items from residents for proper disposal.

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

☐ This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period**.*

Number of SSOs identified: 3

Number of SSOs removed: 3

MS4 System Mapping

Optional: Provide additional status information regarding your map:

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses. Please also include the updated inventory and ranking of outfalls/interconnections based on monitoring results.

- ○ No outfalls were inspected
- ◉ The above referenced outfall screening data is attached to the email submission
- ○ The above referenced outfall screening data can be found at the following publicly available website:

*Below, report on the number of outfalls/interconnections screened **during this reporting period**.*

Number of outfalls screened: 25

*Below, report on the percent of outfalls/interconnections screened **to date**.*

Percent of outfalls screened: 100

Optional: Provide additional information regarding your outfall/interconnection screening:

These 25 outfalls were screened during both dry and wet weather during Permit Year 5.

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- ○ No catchment investigations were conducted
- ◉ The catchment investigation data is attached to the email submission
- ○ The catchment investigation data can be found at the following publicly available website:

*Below, report on the number of catchment investigations completed **during this reporting period**.*

Number of catchment investigations completed this reporting period: 0

Below, report on the percent of catchments investigated ***to date.***

Percent of total catchments investigated: 81

Optional: Provide any additional information for clarity regarding the catchment investigations below:

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- (•) No illicit discharges were found
- ( ) The illicit discharge removal report is attached to the email submission
- ( ) The illicit discharge removal report can be found at the following publicly available website:

Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed ***during this reporting period.***

Number of illicit discharges identified: 0

Number of illicit discharges removed: 0

Estimated volume of sewage removed: gallons/day

Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed ***since the effective date of the permit (July 1, 2018)****.*

Total number of illicit discharges identified: 2

Total number of illicit discharges removed: 2

Optional: Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

2 illicit discharges have been identified since the permit effective date, July 1, 2018.

Employee Training

Describe the frequency and type of employee training conducted **during this reporting period**:

During Reporting Period 5, an educational IDDE video was distributed to 80 staff members.

MCM4: Construction Site Stormwater Runoff Control

Below, report on the construction site plan reviews, inspections, and enforcement actions completed ***during this reporting period****.*

Number of site plan reviews completed: 30

Number of inspections completed: 15

Number of enforcement actions taken: 15

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Date update was completed (due in year 3):

Website of ordinance or regulatory mechanism: https://library.municode.com/ma/revere/codes/code_of_ordinances?nodeId=TIT13PUSE_CH13.10STMA_13.10.030PONSSTMA

As-built Drawings

Below, report on the number of as-built drawings received ***during this reporting period****.*

Number of as-built drawings received: 24

Optional: Enter any additional information relevant to the submission of as-built drawings:

Street Design and Parking Lots Report

Below, describe any changes made or planned to be made to local regulations and guidelines based on the report completed in Year 4:

During permit Year 4, the City developed their Street Design and parking lot Report, which assessed current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover. Regulatory mechanisms were reviewed to determine if changes to existing design standards could be made to support low impact design options and, where appropriate, proposed recommendations to incorporate policies and standards to minimize impervious cover in parking areas and street designs. The City will be revisiting these recommendations during Permit Year 6 in an effort to make updates to local regulations, where feasible.

Green Infrastructure Report

Below, describe progress towards making green infrastructure practices allowable based on the report completed in Year 4:

During Permit Year 4, the City developed a Green Infrastructure Report, which assessed existing local regulatory mechanisms to determine the feasibility of making the following practices allowable when appropriate site conditions exist:

- Green roofs
- Infiltration practices such as rain gardens, curb extensions, planter gardens, porous and pervious pavements, and nature-based stormwater management practices
- Water harvesting devices such as rain barrels and cisterns, and the use of stormwater for non-potable uses
- Open space preservation or cluster development practices

The City will be revisiting these recommendations during Permit Year 6 in an effort to make updates to local regulations, when feasible.

Retrofit Properties Inventory

Below, list remaining permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas (must maintain a minimum of 5 sites in inventory until less than 5 sites remain):

Beachmont Veterans Memorial High School
190 VFW Parkway (New Revere High School site)
Garfield School
Gibson Park
Central Avenue Parking Lot

Below, list all properties that have been modified or retrofitted with BMPs to mitigate impervious area that were inventoried as part of 2.3.6.d of the permit. Non-MS4 owned properties that have been modified or retrofitted with BMPs to mitigate impervious area may also be listed, but must be indicated as non-MS4.

MCM6: Good Housekeeping

Catch Basin Cleaning

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins **during this reporting period**.*

Number of catch basins inspected: 458

Number of catch basins cleaned: 458

Total volume or mass of material removed from all catch basins: 50 tons

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins: 4,148

If applicable:

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

Street Sweeping

*Report on street sweeping completed **during this reporting period** using one of the three metrics below.*

- (●) Number of miles cleaned: 800
- ( ) Volume of material removed: [Select Units]
- ( ) Weight of material removed: [Select Units]

Stormwater Pollution Prevention Plan (SWPPP)

*Below, report on the number of site inspections for facilities that require a SWPPP completed **during this reporting period**.*

Number of site inspections completed: 0

Describe any corrective actions taken at a facility with a SWPPP:

The City of Revere's Department of Public Works Facility was under construction throughout Permit Year 5, preventing SWPPP inspections during the reporting period.

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- (•) Not applicable
- ( ) The results from additional reports or studies are attached to the email submission
- ( ) The results from additional reports or studies can be found at the following publicly available website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above. If any of the above year 5 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 6 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to

receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all curbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary
- Review O&M programs for all permittee owned facilities; update if necessary
- Implement all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implement program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Enclose all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- Review as-built drawings for new and redevelopment to ensure compliance with post construction bylaws, regulations, or regulatory mechanism consistent with permit requirements
- Inspect all permittee owned treatment structures (excluding catch basins)
- Identify additional permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious areas so that the permittee maintains a minimum of 5 sites in their inventory, until such a time when the permittee has less than 5 sites remaining

Provide any additional details on activities planned for permit year 6 below:

Part V: Certification of Small MS4 Annual Report 2023

40 CFR 144.32(d) Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Nicholas Rystrom Title: City Engineer

Signature: NJRystrom Date: 9/28/23

[Signatory may be a duly authorized representative]

Year 6 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2023-June 30, 2024

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form. Also ensure any websites included on this form are to publicly accessible sites

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2023 and June 30, 2024 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization: City of Revere

EPA NPDES Permit Number: MAR041057

Primary MS4 Program Manager Contact Information

Name: Nicholas Rystrom Title: City Engineer

Street Address Line 1: 281 Broadway

Street Address Line 2:

City: Revere State: MA Zip Code: 02151

Email: nrystrom@revere.org Phone Number: (781) 286-8153

Stormwater Management Program (SWMP) Information

SWMP Location (publicly available web address): https://www.revere.org/departments/engineering#resources

Date SWMP was Last Updated: September 2024

If the SWMP is not available on the web please provide the physical address:

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☒ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☐ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. ***By checking each box you are certifying that you have completed that permit requirement fully.*** *If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Annual Requirements

☒ Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements

☒ Kept records relating to the permit available for 5 years and made available to the public

☒ The SSO inventory has been updated, including the status of mitigation and corrective measures implemented

- ○ This is not applicable because we do not have sanitary sewer
- ○ This is not applicable because we did not find any new SSOs
- ○ The updated SSO inventory is attached to the email submission
- ◉ The updated SSO inventory can be found at the following publicly available website:

https://www.revere.org/departments/engineering

☒ Updated system map due in year 10 with information from completed catchment investigations

☒ Provided training to employees involved in IDDE program within the reporting period

☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters

☒ All curbed roadways were swept at least once within the reporting period

☒ Enclosed all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt

☒ Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities

☒ Updated inventory of all permittee owned facilities as necessary

☒ O&M programs for all permittee owned facilities have been completed and updated as necessary

☒ Implemented all maintenance procedures for permittee owned facilities in accordance with O&M programs

☒ Implemented program for MS4 infrastructure maintenance to reduce the discharge of pollutants

☒ Inspected all permittee owned treatment structures (excluding catch basins)

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

☒ Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate

☒ Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time

☐ Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

☒ This is not applicable because there are no septic systems present

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

☒ Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads

○ The street sweeping schedule is attached to the email submission

◉ The street sweeping schedule can be found at the following publicly available website:

https://www.revere.org/street-sweeping

☒ Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Revere maintains an aggressive street sweeping schedule, sweeping every street at least once every two weeks between April and November. Streets with potential for higher pollutant loads are swept more frequently - one or more times per week.

Optional: Use the box below to provide any additional information you would like to share as part of your self-assessment:

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- (●) Yes
- ( ) No

If yes, describe below, including any relevant impairments or TMDLs:

The City has made changes to its list of impairments and outfalls since the NOI was filed. These changes have come as a result of updates to the Massachusetts Integrated List of Waters and findings from the IDDE program.

The Final 2022 Integrated List of Waters included the addition of Enterococcus impairments to Segment MA1-14 of the Belle Isle Inlet and Segment MA71-08 of Mill Creek. There is an approved TMDL for the Mystic River Watershed.

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed **during this reporting period**: 4

*Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.*

BMP:Think Blue Massachusetts

Message Description and Distribution Method:

The City shared the Think Blue Massachusetts' campaign video on the City website. This video encourages residents to be mindful about how pollutants from their property may affect stormwater runoff and local water quality.
https://www.revere.org/departments/engineering#resources

Targeted Audience: Residents

Responsible Department/Parties: Engineering

Measurable Goal(s):

Track number of views.

Message Date(s): Ongoing through Permit Year 6

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Bag Your Leaves

Message Description and Distribution Method:

The City website features an educational message about the importance of bagging leaves to prevent blocked storm drains and water pollution, as well as steps residents can take to properly dispose of their leaf waste.
https://www.revere.org/departments/engineering#about_us

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

Track number of views.

Message Date(s): Ongoing through Permit Year 6

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Dog Waste Flyer

Message Description and Distribution Method:

Dog owners received a flyer with the 2024 dog license renewal mailing including information about the proper management of pet waste.

Targeted Audience: Residents

Responsible Department/Parties: DPW Operations

Measurable Goal(s):

1,847 dog owners received flyers in January 2024.

Message Date(s): Permit Year 6

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ○

If yes, describe why the change was made:

BMP:Scoop the Poop

Message Description and Distribution Method:

The City website features an educational flyer developed by the Mystic River Watershed Association detailing how pet waste can lower water quality and encouraging pet owners to properly dispose of their pet's waste. https://www.revere.org/departments/engineering#resources

Targeted Audience: Residents

Responsible Department/Parties: Engineering

Measurable Goal(s):

Track number of views.

Message Date(s): Permit Year 6

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period**:

The City's most recent SWMP is available on their website. The City is in the process of updating their Stormwater Management Plan, and the updated version will be uploaded to the City's website upon completion.

Was this opportunity different than what was proposed in your NOI? Yes ○ No ◉

Describe any other public involvement or participation opportunities conducted **during this reporting period**:

Household Waste Day
Event Date: July 8, 2023, 9:00AM to 1:00PM
Revere High School
The City hosted a Household Waste Day during construction of the DPW yard to allow residents to drop off bulky and household items. The City accepted mattresses, furniture, appliances and electronics, batteries, mercury, pesticides, paint, tires, and other hazardous materials.

Saturday DPW Disposal Days
Event Date: Last Saturday of each month, starting in January 2024
Revere DPW
The DPW is open on the last Saturday of each month for residents to dispose of certain items, including batteries, light bulbs, thermometers, waste oil, paint, propane tanks, tires, appliances, furniture and other residential items.
https://www.revere.org/trash#saturday

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

☐ This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period**.*

Number of SSOs identified: 25

Number of SSOs removed: 25

MS4 System Mapping

Percent of Phase II map complete: 90

Optional: Provide additional status information regarding your map:

The City's current drainage mapping does reflect integration of the required Phase 2 mapping components. The City's mapping is updated as needed with information from completed catchment investigations. The City's mapping is listed as 90% complete to reflect anticipated refinement still needed.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses. Please also include the updated inventory and ranking of outfalls/interconnections based on monitoring results.

○ No outfalls were inspected

◉ The above referenced outfall screening data is attached to the email submission

○ The above referenced outfall screening data can be found at the following publicly available website:

*Below, report on the number of outfalls/interconnections screened **during this reporting period**.*

Number of outfalls screened: 48

*Below, report on the percent of outfalls/interconnections screened **to date**.*

Percent of outfalls screened: 100

Optional: Provide additional information regarding your outfall/interconnection screening:

During Permit Year 6, 48 outfalls were screened during dry weather and 23 outfalls were screened during wet weather. All outfalls have been screened during dry weather.

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- ○ No catchment investigations were conducted
- ◉ The catchment investigation data is attached to the email submission
- ○ The catchment investigation data can be found at the following publicly available website:

*Below, report on the number of catchment investigations completed **during this reporting period**.*

Number of catchment investigations completed this reporting period: 8

*Below, report on the percent of catchments investigated **to date.***

Percent of total catchments investigated: 90

Optional: Provide any additional information for clarity regarding the catchment investigations below:

Under FY2023 Phase 13 Field Investigations, PEER Consultants, P.C. (PEER) conducted investigative field sampling and testing services in 8 catchment areas in support of the CDM Smith-led IDDE program. PEER's field investigations were conducted from May 31, 2023, through October 6, 2023. The purpose of the investigation was to collect water quality data, identify illicit discharges into the drainage system, and to confirm and map existing infrastructure more accurately. The field investigations included drain segment isolation via sandbagging and subsequent dry weather water quality sampling and field testing, manhole inspection, and sound testing for confirmation of system connectivity.

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- ○ No illicit discharges were found
- ◉ The illicit discharge removal report is attached to the email submission
- ○ The illicit discharge removal report can be found at the following publicly available website:

*Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed **during this reporting period.***

Number of illicit discharges identified: 1

Number of illicit discharges removed: 1

Estimated volume of sewage removed: 110 gallons/day

*Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed **since the effective date of the permit (July 1, 2018)**.*

Total number of illicit discharges identified: 3

Total number of illicit discharges removed: 3

Optional: Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

Employee Training

Describe the frequency and type of employee training conducted **during this reporting period**:

On September 29, 2023, an educational IDDE video was distributed to 414 City employees. Training was also conducted on the Stormwater Pollution Prevention Plan for the new DPW Facility on May 29, 2024 with 17 employees in attendance.

MCM4: Construction Site Stormwater Runoff Control

*Below, report on the construction site plan reviews, inspections, and enforcement actions completed **during this reporting period**.*

Number of site plan reviews completed: 41

Number of inspections completed: 10

Number of enforcement actions taken: 0

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Date update was completed (due in year 3):

Website of ordinance or regulatory https://library.municode.com/ma/revere/codes/code_of_ordinances?

mechanism: nodeId=TIT13PUSE_CH13.10STMA

As-built Drawings

Below, report on the number of as-built drawings received ***during this reporting period****.*

Number of as-built drawings received: 25

Optional: Enter any additional information relevant to the submission of as-built drawings:

Street Design and Parking Lots Report

Below, describe any changes made or planned to be made to local regulations and guidelines based on the report completed in Year 4:

The City will be revisiting the recommendations in the Street Design and Parking Lots Report developed during Permit Year 4 during Permit Year 7 in an effort to make updates to local regulations, where feasible.

Green Infrastructure Report

Below, describe progress towards making green infrastructure practices allowable based on the report completed in Year 4:

The City will be revisiting the recommendations in the Green Infrastructure Report developed during Permit Year 4 during Permit Year 7 in an effort to make updates to local regulations, where feasible.

Retrofit Properties Inventory

Below, list remaining permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas (must maintain a minimum of 5 sites in inventory until less than 5 sites remain):

1) Beachmont Veterans Memorial High School
2) 190 VFW Parkway
3) Garfield School
4) Gibson Park
5) Central Avenue Parking Lot

Below, list all properties that have been modified or retrofitted with BMPs to mitigate impervious area that were inventoried as part of 2.3.6.d of the permit and the type of BMP(s) implemented. Non-MS4 owned properties that have been modified or retrofitted with BMPs to mitigate impervious area may also be listed, but must be indicated as non-MS4.

MCM6: Good Housekeeping

Catch Basin Cleaning

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins **during this reporting period**.*

Number of catch basins inspected: 683

Number of catch basins cleaned: 683

Total volume or mass of material removed from all catch basins: 16,230 cubic feet

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins: 3,226

If applicable:

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

Street Sweeping

*Report on street sweeping completed **during this reporting period** using one of the three metrics below.*

- (●) Number of miles cleaned: 800
- ( ) Volume of material removed: [Select Units]
- ( ) Weight of material removed: [Select Units]

Stormwater Pollution Prevention Plan (SWPPP)

*Below, report on the number of site inspections for facilities that require a SWPPP completed **during this reporting period**.*

Number of site inspections completed: 3

Describe any corrective actions taken at a facility with a SWPPP:

A SWPPP was developed for the new DPW Facility during Permit Year 6. There were only 3 site inspections conducted at the DPW Facility during Permit Year 6, as the new DPW Facility only became operational in November 2023. Based on the SWPPP inspections performed at the facility on March 25 and May 24, 2024, it was recommended that debris be removed from the marsh adjacent to the outfall, and that vehicle dewatering operations be performed in the vehicle wash bay.

Training was conducted on the Stormwater Pollution Prevention Plan for the new DPW Facility on May 29, 2024 with 17 employees in attendance.

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- (•) Not applicable
- ( ) The results from additional reports or studies are attached to the email submission
- ( ) The results from additional reports or studies can be found at the following publicly available website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Additional Information

Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above.

Year 7

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 7 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Complete investigations of catchments associated with Problem Outfalls
- Complete investigations of catchments where any information gathered on the outfall/interconnection identifies sewer input

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all curbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary
- Review O&M programs for all permittee owned facilities; update if necessary
- Implement all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implement program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Enclose all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- Review as-built drawings for new and redevelopment to ensure compliance with post construction bylaws, regulations, or regulatory mechanism consistent with permit requirements
- Inspect all permittee owned treatment structures (excluding catch basins)
- Identify additional permittee-owned properties that could potentially be modified or retrofitted

with BMPs to reduce impervious areas so that the permittee maintains a minimum of 5 sites in their inventory, until such a time when the permittee has less than 5 sites remaining

Provide any additional details on activities planned for permit year 7 below:

Part V: Certification of Small MS4 Annual Report 2024

40 CFR 144.32(d) Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name:	Nicholas Rystrom	Title:	City Engineer
Signature:	NJ Rystrom	Date:	9/30/24

[Signatory may be a duly authorized representative]