

Stormwater Management Program (SWMP) Plan

Town of Lincoln, Massachusetts

Prepared June 30, 2019
Revised December 31, 2025

Prepared For:

Town of Lincoln
16 Lincoln Road
Lincoln, MA 01773



Prepared By:

Comprehensive Environmental Inc.
41 Main Street
Bolton, MA 01740



Stormwater Management Program (SWMP) Plan Revision Log

| Revision Date | Section(s) Revised | Revisions Made | Revisions Made by |
|----------------------|---|---|----------------------------------|
| June 30, 2019 | All | Original SWMP Plan prepared. | Comprehensive Environmental Inc. |
| July 31, 2021 | All | SWMP Plan amended to document work completed during Permit Year 2 and Permit Year 3. | Comprehensive Environmental Inc. |
| June 30, 2022 | 2.4, 7.3.4, 7.3.5, and appendices | Updated TMDL and impaired waterbodies/status, regulatory LID, GI, and impervious cover update, municipal BMP retrofit inventory | Comprehensive Environmental Inc. |
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| December 31, 2025 | 1.5, 4.3.5, and appendices | Updated program contact information, stormwater hotline procedures, stormwater map, street sweeping map, BMP inspection results and annual reporting | December 31, 2025 |
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Stormwater Management Program (SWMP) Plan 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.

Name: Timothy S. Higgins Title: Town Administrator

Signature: *Timothy S. Higgins* Date: March 10, 2026

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1 Introduction

Lincoln is one of many Massachusetts communities regulated under the Environmental Protection Agency's (USEPA) National Pollutant Discharge Elimination System (NPDES) Phase II rule (40 CFR 122). The rule requires regulated operators of municipal separate storm sewer systems (MS4) to develop a Stormwater Management Program (SWMP) and Best Management Practices (BMPs) to reduce the impacts of stormwater discharges. The requirements are outlined in the NPDES General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts, which was signed on April 4, 2016, with an effective date of July 1, 2018, hereinafter referred to as the 2016 MS4 Permit.

This SWMP Plan describes and details the activities and measures that are being implemented to meet the terms and conditions of the permit.

1.1 Regulatory Background

The Stormwater Phase II Final Rule was promulgated in 1999 and was the next step after the 1987 Phase I Rule in the United States Environmental Protection Agency's effort to preserve, protect, and improve the Nation's water resources from polluted stormwater runoff. The Phase II program expands the Phase I program by requiring operators of Small Municipal Separate Storm Sewer Systems in urbanized areas, through the use of National Pollutant Discharge Elimination System permits, to implement programs and practices to control polluted stormwater runoff. Phase II is intended to further reduce adverse impacts to water quality and aquatic habitat by instituting the use of controls on the unregulated sources of stormwater discharges that have the greatest likelihood of causing continued environmental degradation. Under the Phase II rule all MS4s with stormwater discharges from Census designated Urbanized Area are required to seek NPDES permit coverage for those stormwater discharges.

On May 1, 2003, EPA Region 1 issued its Final General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (2003 MS4 Permit) consistent with the Phase II rule. The 2003 MS4 Permit covered "traditional" (i.e., cities and towns) and "non-traditional" (i.e., certain Federal and state agencies and/or facilities) MS4 Operators located in the states of Massachusetts and New Hampshire. This permit expired on May 1, 2008 but remained in effect until operators were authorized under the USEPA's 2016 NPDES General Permit for Stormwater Discharges from MS4 in Massachusetts, hereafter referred to as the "2016 Massachusetts MS4 Permit", "2016 Permit", "MS4 Permit, and/or "2016 MS4 Permit" which replaces the 2003 MS4 Permit.

The 2016 Massachusetts MS4 Permit was signed on April 4, 2016 with an original effective date of July 1, 2017, however was postponed by 1 year to a new effective date of July 1, 2018. The permit was cosigned by the Massachusetts Department of Environmental Protection (MassDEP) and thus is jointly regulated by EPA and MassDEP for Massachusetts permittees. After several years of litigation, the permit was updated in December 2020 with a revised effective date of January 6, 2021. Authorization to discharge was set to expire on

July 1, 2022, however, was administratively continued by EPA. The 2016 Permit remains in force and effect until a general permit is reissued at a future time.

The following sections outline how the Town of Lincoln is meeting Phase II regulatory and schedule requirements.

1.2 MS4 Program

As required by the 2016 MS4 Permit, The Town of Lincoln submitted a Notice of Intent (NOI) and required accompanying information, including endangered species, historic preservation, and an outfall map to EPA Region 1 by the September 28, 2018 deadline (**Appendix A**) requesting authorization to discharge under the new permit. Lincoln received official authorization to discharge stormwater from its MS4 on June 4, 2019. Authorization to discharge expires at June 30, 2022.

This Stormwater Management Program Plan has been developed by the Town of Lincoln to address the requirements of the 2016 MS4 Permit as a follow-up to the NOI. This SWMP Plan documents the Town of Lincoln’s program, including Best Management Practices, plans, activities, and measures that have been implemented to date, those that are ongoing, and those proposed for the future to comply with the 2016 MA MS4 Permit. This is a “living” document and should be updated and/or modified as required during the permit term as the permittee's activities are modified, changed or updated to meet permit conditions during the permit term.

This permit in part requires that each permittee, or regulated community, address 6 Minimum Control Measures (MCMs). These measures include the following:

1. Public Education and Outreach;
2. Public Involvement and Participation;
3. Illicit Discharge Detection and Elimination Program;
4. Construction Site Stormwater Runoff Control;
5. Stormwater Management in New Development and Redevelopment (Post Construction Stormwater Management); and
6. Good Housekeeping and Pollution Prevention for Permittee Owned Operations.

In addition to the 6 MCMs above, permittees must also address water quality impacts from waterbodies with approved Total Maximum Daily Loads (TMDLs) and certain impairments, generally known as water quality limited waterbodies.

1.3 Regulated Area

Requirements of the 2016 MS4 Permit are limited to a regulated area, defined as the Town’s Urbanized Areas (UAs) which generally constitute the largest and most dense areas of settlement in a region. The Bureau of the Census determines UAs by applying a detailed set of published UA criteria to the latest decennial census data. Although the full UA definition is complex, the Bureau of the Census’ general definition of a UA, based on population and population density, is provided below:

“An urbanized area (UA) is a densely settled core of census tracts and/or census blocks that have population of at least 50,000, 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. It is a calculation used by the Bureau of the Census to determine the geographic boundaries of the most heavily developed and dense urban areas.”

The most recent UA maps are based on the 2010 Census, as no new UA maps based on 2020 Census data have been generated by EPA as of the updated date of this plan. **Figure 1-1** shows the UA in the Town of Lincoln, which generally exists in the northern, eastern, and southern portions of the town and generally excludes the more rural central and western portions. Per 2010 Census data, the Town’s UA covers 4,833 people out of a total 6,359, or approximately 76% of the population. The UA area decreased slightly since the 2000 Census, generally reducing a previously developed area in the southeastern quadrant of the Town., however, it should be noted that EPA defines the regulated UA as applying to any area of the community identified by an official Census, regardless of the year. Thus, areas that are identified as non-urbanized under the 2010 Census but urbanized under the 2000 Census are still regulated areas. In short, the regulated UA cannot shrink and can only expand. The UA is subject to change every 10 years based on the application of the Census definition, thus a larger area may be covered in the future.

1.4 How to Use this Plan

For the purposes of the 2016 MS4 Permit and ease of use, the Town’s SWMP encompasses six separate written documents:

1. SWMP Plan (this document);
2. Illicit Discharge Detection and Elimination (IDDE) Plan (standalone document);
3. Operation and Maintenance (O&M) Plan (standalone document);
4. Stormwater Pollution Prevention Plan (SWPPP) (standalone document);
5. Phosphorus Control Plan (PCP) (standalone document); and
6. Salt Reduction Plan (standalone document).

This SWMP Plan is divided into several sections and includes the following components:

- Section 2 Town Characteristics** – Section 2 provides an overview of relevant characteristics, focusing on those aspects related to stormwater runoff and the water quality of surface waters.
- Section 3 MCM 1: Public Education and Outreach** – regulated operators of MS4s are required to implement a public education program. Section 3 discusses activities to comply with this measure.
- Section 4 MCM 2: Public Participation and Involvement** – regulated MS4s are required to obtain public participation throughout the stormwater management program. Section 4 discusses activities to comply with this measure.

- Section 5** **MCM 3: Illicit Discharge, Detection, and Elimination** – regulated MS4s must develop and implement an illicit discharge detection and elimination program and develop a regulation to prohibit illicit discharges to the storm drain system. Section 5 discusses activities to comply with this measure.
- Section 6** **MCM 4: Construction Site Stormwater Runoff Control** – regulated MS4s are required to implement and enforce a program to reduce pollutants in stormwater runoff from construction activities that disturb 1 or more acres. This requires the development of a local regulation requiring implementation of proper erosion and sediment controls. Permittees are also responsible for inspections and enforcement. Section 6 discusses activities to comply with this measure.
- Section 7** **MCM 5: Stormwater Management in New Development and Redevelopment** – regulated MS4s are required to develop and enforce a regulation requiring implementation of post-construction runoff controls at sites where construction activities disturb 1 or more acres. The controls must be designed to treat stormwater runoff from post-development sites and must be maintained over the long-term. Section 7 discusses activities to comply with this measure.
- Section 8** **MCM 6: Good Housekeeping and Pollution Prevention** – regulated MS4s must review their operations at specific facilities and those that occur throughout the Town (i.e., catch basin cleaning and street sweeping) and make improvements where needed to minimize pollution to stormwater runoff. Staff involved in these operations must also be trained on appropriate operations and maintenance techniques. Section 8 discusses activities to comply with this measure.
- Section 9** **TMDL and Impaired Waters Controls** – regulated MS4s are required to evaluate and address stormwater contributions to impaired waters. Section 9 discusses activities to comply with this measure.
- Section 10** **Annual Reporting** – Section 10 provides a summary of annual reporting requirements in order to meet the 2016 MS4 Permit.
- Section 11** **Implementation of Best Management Practices** – Section 11 provides a summary of BMPs outlined in Sections 3 through 9 in a concise plan for easy reference.

1.5 Program Responsibilities

This plan is intended to be used by Town of Lincoln staff whose job involves administering the MS4 permit and associated requirements. The Town’s MS4 program is headed by the following personnel:

Table 1-1. MS4 Responsible Personnel

| Name | Title, Department | Contact |
|------------------------|---|---|
| Timothy Higgins | Town Administrator | (781) 259-2600, higginst@LincolnMa.gov |
| Stephen Olson | Superintendent, Department of Public Works | (781) 259-8999, olson@LincolnMa.gov |
| Paula Vaughn-MacKenzie | Director of Planning and Land Use | (781) 259-2610, vaughnp@LincolnMa.gov |
| Jennifer Curtin | Assistant Director of Planning and Land Use | (781) 259-2610, curtinj@LincolnMa.gov |
| Michele Grzenda | Conservation Director | (781) 259-2703, grzendam@LincolnMa.gov |
| Stacy Carter | Conservation Planner | (781) 259-2612, stacyc@LincolnMa.gov |

The Town of Lincoln has 11 departments responsible for implementing portions of its MS4 program as identified in the NOI. Therefore, due to the extensive number of departments involved as part of the Town’s MS4 program, it is not feasible to list names and titles of responsible personnel for each one, as the information within this plan would be frequently out of date. However, **Table 1-2** provides a list of responsible departments and their general responsibilities within the MS4 program. The responsible person is the most senior person (e.g. department head, administrator, senior elected official, etc.) within each department listed below.

Table 1-2. Program Responsibilities

| Department / Division | General Responsibilities |
|-------------------------|--|
| Building Department | Site plan review procedures; site inspections and procedures; regulation development; as-built submittal; target properties to reduce impervious areas and for BMP retrofit; inventory buildings and facilities; develop operation and maintenance procedures |
| Health Department | IDDE program creation and implementation; bylaw development |
| Conservation Commission | Public education and participation; bylaw and regulation development; site plan review procedures; site inspections and procedures; as-built submittal; target properties to reduce impervious areas and for BMP retrofit; TMDL and water quality limited requirements |
| Fire Department | Spill-related employee training |
| Information Technology | Website-related public education |
| Parks and Recreation | Inventory buildings and facilities; develop operation and maintenance procedures |

Table 1-2 (continued). Program Responsibilities

| Department / Division | General Responsibilities |
|---|---|
| Planning and Land Use | Public education; bylaw and regulation development; site plan review procedures; site inspections and procedures; as-built submittal; target properties to reduce impervious areas and for BMP retrofit |
| Public Works | Public participation; system mapping; IDDE program creation and implementation; bylaw and regulation development; inventory buildings and facilities; establish operation and maintenance procedures; SWPPP development and implementation; catch basin cleaning and street sweeping; road salt optimization program; BMP inspections and maintenance; employee training; TMDL and water quality limited requirements |
| Schools | Public participation |
| Town Administrator / Board of Selectmen | Allow public participation in the stormwater program, general program oversight |
| Town Clerk | Information distribution for public education |

2 Town Characteristics

This section provides some background information on the Town of Lincoln, Massachusetts, useful in understanding the Town’s characteristics and resources to develop a tailored Stormwater Management Plan. Town characteristics are described below.

2.1 Community Information

Lincoln is located in eastern Massachusetts within Middlesex County, approximately 15 miles due west of Boston and just west of I-95. It is generally bordered by Bedford to the north, Lexington to the east, Waltham to the southeast, Weston to the south, Sudbury to the southwest, and Concord to the northwest. The Cambridge Reservoir also lies on Lincoln’s eastern border, and the Sudbury River and Fairhaven Bay system follow a portion of its western border. The Town area includes three separate watersheds; the Charles River, the Shawsheen River, and the Sudbury, Concord, Assabet (SuAsCo) Rivers. Hanscom Air Force Base is also partially located within town along the northern border, but operates under its own MS4 permit and thus is not included in Lincoln’s program. Select relevant community profile information is provided as of the original date of this SWMP below:

- Total Area = 15.0 square miles (*source: Wikipedia*)
- 2010 Population = 6,359 (*source: EPA maps based on 2010 US Census*)
- Regulated Area Population = 4,833 (*source: EPA maps based on 2010 US Census*)

2.2 Demographics

Demographics play a role in developing a public education program that targets the appropriate audience through the most appropriate means. Information on owner occupancy versus rentals and languages spoken can help shape how information is disseminated. In Lincoln, there are about 76 people who speak English less than “very well” (*source: www.statisticalatlas.com*) as of the original date of this SWMP. Because this is only about 0.01% of the population, the public education and outreach program can proceed with distributing its materials in English.

2.3 Land Use

The land uses as of the original date of this SWMP within the regulated area are shown on **Figure 2-1** and provided below. Impervious area is shown on **Figure 2-2**.

- Commercial and Urban 7%
- Forest 48%
- Open Land and Agriculture 7%
- Recreation 1%
- Residential 19%
- Transportation and Utilities 2%
- Wetlands 13%
- Water 3%

As per the above, Lincoln has substantial forest, open land, and water/wetland area (approximately 72%), with much of the remaining consisting of low-density residential development (approximately 19%). Remaining land use (approximately 10%) consists largely of roadways and minor commercial development.

2.4 303(d) Impaired Waterbodies

The ultimate goal of this Stormwater Management Plan is to outline a program to effectively maintain the Town’s stormwater infrastructure and to improve the water quality of receiving waters (waters which receive stormwater discharges from the MS4) in compliance with the 2016 MS4 Permit. 303(d) impaired waters are those surface waters identified by the MassDEP as priority waters that do not meet water quality criteria. As part of the 2016 MS4 Permit, communities must implement BMPs to address all 303(d) waters and specifically address those that have a completed TMDL study. **Table 2-1** lists the “impaired waters” partially or wholly located within the boundaries of Lincoln’s regulated area based on the Final Massachusetts Integrated List of Waters produced by MassDEP every 2 years¹. These waters are shown in **Figure 2-3**. Lincoln reviews changes as new lists are published and updates this plan as required.

Table 2-1. Impaired Waters

| Waterbody Name | Segment ID and Category | | Impairment(s) | Approved TMDL ² |
|----------------------------------|-------------------------|---|---|----------------------------|
| Cambridge Reservoir | MA72014 | 5 | Chloride | |
| Cambridge Reservoir, Upper Basin | MA72156 | 5 | Aquatic Plants (Macrophytes) | |
| | | | Turbidity | |
| | | | Chloride | |
| Elm Brook | MA83-24 | 5 | (Physical substrate habitat alterations*) | |
| | | | Fecal Coliform | 2587 |
| | | | Escherichia coli | 2587 |
| | | | Sedimentation/Siltation | |
| Farrar Pond | MA82036 | 5 | Mercury in Fish Tissue | |
| Hobbs Brook | MA72-45 | 5 | Chloride | |
| Shawsheen River | MA83-08 | 5 | Fecal Coliform | 2587 |
| | | | Physical substrate habitat alterations | |
| | | | Dissolved Oxygen | |
| | | | Escherichia coli | 2587 |
| Stony Brook | MA72-26 | 5 | Temperature | |
| Unnamed Tributary | MA72-47 | 5 | Chloride | |

Category 5 Waters – impaired waters that require a TMDL.

*TMDL not required (Non-pollutant)

¹At the time of preparation of this report, the 2022 303d List is the most up to date finalized version.

²“Approved TMDLs” are those that have been approved by EPA as of the date of issuance of the 2016 MS4 Permit.

Note that although Lincoln has a waterbody listed as impaired for dissolved oxygen and mercury, the 2016 MS4 Permit does not specify a wasteload allocation or other requirements for MS4 discharges.

Lincoln is also subject to the Charles River phosphorus TMDL, as the Town discharges to the Charles River (MA72-07) via Stony Brook (MA72-26). Lincoln is meeting the requirements for this waterbody and remaining requirements for TMDL or water quality limited waterbodies related to bacteria, turbidity, sedimentation/siltation, and chloride as outlined further in Section 9.

2.5 Measures to Protect Surface Drinking Water Supplies

Lincoln in part obtains public drinking water supply from Flint's Pond (also known as Sandy Pond) a waterbody located outside of the town's urbanized area and surrounded by forest. Since 1874, the Town has recognized the need to protect its watershed which consists of approximately 465 acres of land surrounding Flint's Pond, of which approximately 92 percent is owned and/or controlled by the Town. The Town has prepared a Watershed Protection Plan designed to limit access to the water and protect the land from any development that would endanger the water supply. Additionally, in 2012 the Town adopted an Aquifer Protection & Watershed Protection Overlay District to its Zoning By-Laws, and in 2013 the Town updated its Surface Water Supply Protection Bylaw (**Appendix B**) to comply with State regulations. Among other items, the Surface Water Supply Protection Bylaw prohibits or requires a special permit for many uses within the contributing watershed area that may be more likely to cause pollution surface waters. Prohibited or limited uses include storage of liquid wastes, gas stations, automobile salvage yards, road salt storage, fertilizer and pesticide bulk storage, or adding more than 2,500 square feet of impervious surface for non-residential purposes.

There are approximately a half-dozen outfalls located on Deerhaven Road that are located within the Flint's Pond watershed, none of which exhibited evidence of an illicit discharge during dry weather outfall inspections. This roadway is narrow and serves only light density residential. There are also several outfalls located along Sandy Pond Road at the southwest corner of the waterbody that discharge stormwater into Flint's Pond, however, outfalls are located outside of the urbanized area. Outfalls are located well away from developed parcels and only convey stormwater runoff from lightly traveled Sandy Pond Road. Thus, illicit discharges at these locations are highly unlikely although these locations have not been screened during dry weather flows to date due to their location outside the regulated MS4 area. In all likelihood, the greatest threat to these outfalls on both roadways would be due to a spill in the event of an automobile accident. However, both roads are relatively narrow (estimated at 22-feet wide with no fog lines) as traffic (and particularly large truck traffic) is very minimal. Outfalls are shown on **Figure 2-4**.

Portions of the Town are also located within the Hobbs Brook and Stony Brook watersheds which first drain to the Cambridge Reservoir in Lincoln/Waltham and eventually drain to the

Stony Brook Reservoir in Weston. There are several dozen outfalls located within these watersheds, all of which were screened for potential illicit discharges during dry weather and no indicators were identified. These watersheds also contain the heavily traveled Trapelo Road (town-owned) and Route 2 (state-owned), both of which are more likely to have a spill due to a motor vehicle accident than other roadways. Town departments such as Public Works and Fire are regularly on patrol along these roadways and have countermeasures available in the event that a spill occurs within the Cambridge Reservoir / Stony Brook Reservoir watersheds. Outfalls are shown on **Figure 2-4**.

2.6 Endangered Species Act Determination

In order to be eligible to discharge stormwater under the 2016 MS4 Permit, the Town of Lincoln must certify that its stormwater system is not impacting federally listed rare or endangered species habitat or other critical environmental locations. This was completed in the summer of 2018 as meeting “Criterion B” on the Notice of Intent with the results documented in **Appendix A**. The Northern Long-eared Bat (*Myotis septentrionalis*), Red Knot (*Calidris canutus rufa*), and Roseate Tern (*Sterna dougallii dougallii*) were identified as potentially being present within Lincoln’s regulated area. No critical habitats were identified.

2.7 National Historic Preservation Act Determination

Regulated MS4s must also evaluate whether its discharges have the potential to affect historic properties. The MS4 Permit typically authorizes discharges from existing facilities and requires control of the pollutants discharged from the facility, however, EPA does not anticipate effects on historic properties from the pollutants in the authorized discharges. Thus, to the extent EPA’s issuance of the MS4 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. If there have been no relevant changes in operation of the MS4 since the 2003 MS4 General Permit, the discharge can still be considered to have no potential to have an effect on historic properties. This has been documented as “Criterion A” on the Notice of Intent (**Appendix A**) and thus no additional information is required for documentation.

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. In these cases, such as during future construction of structural stormwater BMPs, the Town will need to ensure that historic properties will not be impacted by their activities, or that they are in compliance with a written agreement with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), or other tribal representative that outlines all measures the applicant will carry out to mitigate or prevent any adverse effects on historic properties. This will be completed as required during a later date(s).

3 MCM 1: Public Education and Outreach

3.1 Summary of Permit Requirements

3.1.1 Core Permit Requirements

Under MCM 1, permittees must develop an educational program, define educational goals, express specific messages, define the targeted audience for each message, and identify responsible parties for program implementation. At a minimum, the program must 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 must identify steps and/or activities that the public can take to reduce the pollutants in stormwater runoff and their impacts to the environment. The Town must address 4 core target audiences, unless 1 of these audiences is not present in the MS4 community:

1. Residents;
2. Businesses, Institutions, and Commercial facilities;
3. Developers and Construction; and
4. Industrial facilities.

Because no industrial sector exists in the Town of Lincoln, Item 4 on the above list does not apply to its MS4 and has been omitted from the Town’s program. At least 2 educational messages must be distributed to the remaining audiences over the permit term spaced at least a year apart. See sections below for more information.

3.1.2 TMDL & Impaired Waters Requirements

Public education and outreach programs must also address impaired waterbodies or those identified as priority waters. In Lincoln, the only waterbody impairments listed as having specific requirements under the 2016 MS4 Permit are phosphorus, turbidity, chloride, sedimentation/siltation, and bacteria. Priority waterbodies and impairments can be found in **Table 3-1**.

Table 3-1. Priority Waterbodies

| Waterbody Name | Impairment |
|----------------------------------|--|
| Cambridge Reservoir | Chloride |
| Cambridge Reservoir, Upper Basin | Turbidity, Chloride |
| Charles River | Phosphorus |
| Elm Brook | Sedimentation/Siltation, Fecal Coliform, Escherichia Coli |
| Hobbs Brook | Chloride |
| Shawsheen River | Fecal Coliform, Escherichia Coli |
| Unnamed Tributary | Chloride |

Although the Cambridge Reservoir (Upper Basin) is listed as impaired for turbidity and Elm Brook is listed as impaired for sedimentation/siltation, there are no specific public education requirements to address these pollutants. Additionally, although Cambridge Reservoir (Upper Basin), Cambridge Reservoir, Hobbs Brook, and Unnamed Tributary are listed as impaired for chloride, there are also no specific public education requirements to address this pollutant. Similarly, the Charles River phosphorus TMDL requirements do not outline specific public education requirements. Relevant public information on bacteria and chloride topics as outlined by the 2016 MS4 Permit is included with each of the applicable target audiences as outlined below.

3.2 Objectives and Goals

The Town of Lincoln implements an education program that includes educational goals based on stormwater issues of significance within the MS4 area, increase knowledge, and change behavior of the public so that pollutants in stormwater are reduced.

3.3 Public Education Program

The following sections outline how Lincoln is meeting the requirements of the 2016 MS4 Permit by completing targeted outreach to the 3 required audiences. Industrial audiences are not present in Lincoln and are not being targeted. Additionally, since the Town has waterbodies with water quality impairments associated with bacteria, the program includes messages to help minimize contributions of these pollutants, in accordance with the “Enhanced BMPs” requirements in Appendix F of the 2016 MS4 Permit.

3.3.1 Residential

Informational Topics

As required for all communities under the 2016 MS4 Permit, the following topics are addressed under the Residential public education and outreach program:

- Effects of outdoor activities such as lawn care (use of pesticides, herbicides, and fertilizers) 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; and
- Maintenance of septic systems.

As required for water quality limited waterbodies where bacteria and pathogen is the cause of impairment, the Town shall supplement its Residential program with the following:

- An annual message encouraging the proper management of pet waste;
- Distribute educational materials to dog owners with license issuance or renewal;
- Describe detrimental impacts of improper management of pet waste, requirements for waste collection and disposal, and penalties for non-compliance; and

- Provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria or pathogens.

Educational Message and Methods of Distribution

The following table shows the educational messages and methods of distribution for the above topics, along with responsible parties and measurable goals.

Table 3-2. BMP Description – Residential Outreach

| BMP Description | Message | Method of Distribution | Responsible Parties | Measurable Goal |
|---|---------------------------------|---|---|---|
| BMP 1-1: Residential Education Program | Stormwater flyers and brochures | Distribute flyers to new residents with a welcome packet, with pet registrations and renewals, for download via the Town webpage, at public buildings, and with a homeowner and contractor BMP manual | Town Clerk, Conservation Commission, Information Technology | Distribute flyers and brochures continually via each method of distribution |
| | Stormwater and GIS webpage | Provide relevant information and links for viewing and/or download from Town webpage | Information Technology, Conservation Commission | Continue to update and maintain the websites to include relevant stormwater information |
| | Newspaper articles | Publish an educational newspaper article in the newspaper. | Conservation Commission | Write at least 1 article per year. |
| | Social media outreach | Provide relevant information to different audiences via various social media platforms | Information Technology | Follow statewide “Think Blue” campaign on social media platforms |
| | Conservation walk | Host a conservation walk to discuss environmental issues | Conservation Commission | Continue to provide biannual series of educational outings for the public. |

The following table lists which of the topics are covered under each message.

Table 3-3. Residential Public Outreach Topics and Message

| Topics and Educational Message | Stormwater Flyers | Stormwater Webpage | Newspaper Articles | Social Media Outreach | Conservation Walk |
|--|--------------------------|---------------------------|---------------------------|------------------------------|--------------------------|
| Core Program Topics | | | | | |
| Effects of outdoor activities such as lawn care (use of pesticides, herbicides, and fertilizers) on water quality | X | X | X | X | X |
| Benefits of appropriate on-site infiltration of stormwater | X | X | X | X | X |
| Effects of automotive work and car washing on water quality | X | X | X | X | |
| Proper disposal of swimming pool water; | X | X | X | X | |
| Proper management of pet waste | X | X | X | X | X |
| Maintenance of septic systems | X | X | X | X | |
| An annual message encouraging the proper management of pet waste, including noting any existing bylaws where appropriate | X | X | | X | |
| Disseminate educational materials to dog owners at the time of issuance or renewal of a dog license, or other appropriate time | X | X | | X | |
| Describe detrimental impacts of improper pet waste management, requirements for waste collection and disposal, and penalties for non-compliance | X | X | | X | |
| Provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria or pathogens | | X | | X | |

Schedule

Due to the importance of educating Town residents, many of the above topics are be made available continuously via brochures and the website. Information pertaining to the bacteria seasonal messages is be made available on the website continuously with notes provided for the appropriate timeframes for implementing certain topics.

3.3.2 Businesses, Institutions, and Commercial Facilities

Informational Topics

As required for all communities under the 2016 MS4 Permit, the following topics are addressed under the Business, Institutions, and Commercial public education and outreach program:

- Proper lawn maintenance (use of pesticides, herbicides and fertilizer);
- Benefits of appropriate on-site infiltration of stormwater;
- Building maintenance and storage of materials;
- Proper use and storage of salt or other de-icing and anti-icing materials;
- Proper management of waste materials and dumpsters;
- Proper management of parking lot surfaces;
- Proper car care activities; and
- Proper disposal of swimming pool water by entities such as motels, hotels, and health and country clubs.

Educational Message and Methods of Distribution

The following table shows the educational messages and methods of distribution for the above topics, along with responsible parties and measurable goals. All informational topics are addressed on the Town’s website.

Table 3-4. BMP Description – Businesses, Institutions, and Commercial Outreach

| BMP Description | Message | Method of Distribution | Responsible Parties | Measurable Goal |
|---|----------------------------|--|---|---|
| BMP 1-2: Businesses, Institutions, and Commercial Education Program | Stormwater and GIS webpage | Provide relevant information and links for viewing and/or download from Town webpage | Information Technology, Conservation Commission | Continue to update and maintain the websites to include relevant stormwater information |
| | Social media outreach | Provide relevant information to different audiences via various social media platforms | Information Technology | Follow statewide “Think Blue” campaign on social media platforms |

Schedule

Information pertaining to the Business, Institutions, and Commercial public education and outreach program is made available on the website and via social media continuously. Information pertaining to the chloride seasonal messages are be made available on the website continuously with notes provided for the appropriate timeframes for implementing certain topics.

3.3.3 Developers and Construction

Informational Topics

As required for all communities under the 2016 MS4 Permit, the following topics are addressed under the Developers and Construction public education and outreach program:

- 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).

Educational Message and Methods of Distribution

The following table shows the educational messages and methods of distribution for the above topics, along with responsible parties and measurable goals. All informational topics are addressed on the Town’s website and via erosion control and fact sheets provided to developers when applying for applicable permits.

Table 3-5. BMP Description – Developers and Construction Outreach

| BMP Description | Message | Method of Distribution | Responsible Parties | Measurable Goal |
|---|-------------------------------------|--|---|---|
| BMP 1-3: Developers and Construction Education Program | Stormwater and GIS webpage | Provide relevant information and links for viewing and/or download from Town webpage | Information Technology, Conservation Commission | Continue to update and maintain the websites to include relevant stormwater information |
| | Social media outreach | Provide relevant information to different audiences via various social media platforms | Information Technology | Follow statewide “Think Blue” campaign on social media platforms |
| | Homeowner and contractor BMP manual | Provide homeowner and contractor BMP manual for ecological design, construction, and maintenance | Conservation Commission, Information Technology | Continue to provide manual both online and in print, with updates on best current methods |

Schedule

Information pertaining to the Developers and Construction is made available continuously on the website and via social media. Information pertaining to the chloride seasonal messages are be made available on the website continuously with notes provided for the appropriate timeframes for implementing certain topics.

3.4 Measuring Public Education Program Effectiveness

During completion of the Town’s annual report as detailed further under Section 10, Lincoln reviews the effectiveness of each message and the Town’s overall education program. Effectiveness is expected to vary by message, however is generally measured based on quantities of materials distributed and feedback from town employees based on observations in their area of work. Educational messages and/or distribution techniques are modified as needed, should program managers determine that they are ineffective.

4 MCM 2: Public Participation & Involvement

4.1 Summary of Permit Requirements

Under MCM 2, permittees must provide annual opportunities for public participation in the review and implementation of the Town’s SWMP as part of a public education and involvement program. All public involvement activities must comply with state public notice requirements. The SWMP and annual reports must also be made available so that the public has opportunities to review and comment.

4.2 Objectives and Goals

Lincoln implements a public participation and involvement program that provides opportunities for review and implementation of the Town’s SWMP. This helps support public education and outreach items under MCM 1.

4.3 Public Participation and Involvement Opportunities

The following outlines how Lincoln is meeting permit requirements to provide the public with opportunities to participate in reviewing and implementing the SWMP.

4.3.1 Make Documents Publicly Available for Comment

Lincoln makes this written SWMP Plan and annual reports available for review and comment via the Town’s website, along with the name, email address and/or phone number of a contact person from the Town government to request additional information or submit comments. This allows the public to comment on the program at least once per year. An updated SWMP Plan is posted to the website annually as additional tasks are completed. The following table shows the BMP, responsible parties and measurable goals.

Table 4-1. BMP Description – Make Documents Publicly Available for Comment

| BMP Description | Responsible Parties | Measurable Goal |
|--|---|--|
| BMP 2-1: Make SWMP Plan Publicly Available | Conservation Commission, Information Technology, Town Administrator / Board of Selectmen, Planning Department | Annual review of stormwater management plan and posting on website. Allow public to comment on the plan at least annually. |

4.3.2 Watershed Group Involvement

The Town participates in various watershed groups, such as the Charles River Stormwater Collaborative, MAGIC Stormwater Partnership, and SuAsCo River Stewardship Council. The following table shows the BMP, responsible parties and measurable goals.

Table 4-2. BMP Description – Watershed Group Involvement

| BMP Description | Responsible Parties | Measurable Goal |
|--|----------------------------|---|
| <u>BMP 2-2:</u> Watershed Group Involvement | Conservation Commission | Participate in multiple watershed groups to help protect the environment. |

4.3.3 Habitat Inventory and Monitoring

The Town will continue the baseline monitoring of conservation lands and holdings, as well as long-term ecosystem monitoring studies, with the help of local volunteers and through a partnership with Brandeis University and Harvard Forest. The following table shows the BMP, responsible parties and measurable goals.

Table 4-3. BMP Description - Habitat and Inventory Monitoring

| BMP Description | Responsible Parties | Measurable Goal |
|---|----------------------------|--|
| <u>BMP 2-3:</u> Habitat Inventory and Monitoring | Conservation Commission | Continue to conduct habitat inventories and monitoring of Town conservation lands and holdings |

4.3.4 Wetland Restoration

Lincoln works with both community volunteers and local schools to restore its wetland habitats. This is done through the removal of invasive species in order to maintain the health of native plant ecosystems for stormwater control. The following table shows the BMP, responsible parties and measurable goals.

Table 4-4. BMP Description - Wetland Restoration

| BMP Description | Responsible Parties | Measurable Goal |
|--|----------------------------------|---|
| <u>BMP 2-4:</u> Wetland Restoration | Conservation Commission, Schools | Work with community and/or school groups and least once annually to restore wetland habitat |

4.3.5 Response to Public Stormwater Hotline

The Town via the DPW will continue to address concerns or questions received from the public regarding stormwater and illicit discharges. Complaints will be tracked in a database,

along with any relevant follow-up actions for annual reporting purposes. The following table shows the BMP, responsible parties and measurable goals.

Table 4-5. BMP Description - Public Stormwater Hotline

| BMP Description | Responsible Parties | Measurable Goal |
|--|---|--|
| <u>BMP 2-5:</u> Response to Public Stormwater Hotline | Conservation Commission, Department of Public Works | Respond to questions or complaints received from the public and track on a database any complaints received, as well as follow-up actions. |

5 MCM 3: Illicit Discharge, Detection, and Elimination

5.1 Summary of Permit Requirements

Under MCM 3, permittees must implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its MS4 and implement procedures to prevent such discharges. A summary of the required IDDE activities and timelines are provided below. See sections below for more information.

5.1.1 Legal Authority

The IDDE program shall include adequate legal authority in the form of a currently effective ordinance, bylaw, or other regulatory mechanism to prohibit, investigate, and eliminate illicit discharges. For permittees authorized by the MS4-2003 permit such as Lincoln, the ordinance, bylaw, or other regulatory mechanism was required to be effective by May 1, 2008.

5.1.2 Sanitary Sewer Overflow

Regulated communities must identify all known locations where sanitary sewer overflows (SSOs) have discharged to the MS4 during the previous 5-years and update it annually. Upon detection of an SSO, the permittee must eliminate it as quickly as possible and take interim mitigation measures to minimize or eliminate the discharge of pollutants until remediation work is complete.

5.1.3 System Mapping

Regulated communities must complete a comprehensive map of their stormwater system in 2 phases. Phase 1 must be completed within 2 years and include infrastructure such as outfalls and preliminary catchment delineations, waterbodies, open channel conveyances, interconnections with other MS4s, and structural stormwater BMPs. Phase 2 must be completed within 10 years and include information such as outfalls with high accuracy GPS location and refined catchment delineations, catch basins, manholes, pipe connectivity, and sanitary or combined sewer systems as available/applicable.

5.1.4 Illicit Discharge, Detection, and Elimination Program

The 2016 MS4 Permit requires preparation of a comprehensive written IDDE Program or IDDE Plan that provides detailed procedures for assessment and priority ranking of outfalls and interconnections, dry and wet weather outfall sampling, catchment investigation procedures, system vulnerability factor (SVF) assessment, identification of an illicit discharge, illicit discharge removal, and ongoing screening requirements. The written IDDE Program must be prepared as a standalone IDDE Plan separate from this SWMP Plan.

5.1.5 Annual IDDE Training

The 2016 MS4 Permit requires annual IDDE training to be provided to all employees involved in the IDDE program. Training must, at a minimum, include information on how to identify illicit discharges and SSOs and may also include additional training specific to the functions of particular personnel and their function within the framework of the IDDE program.

5.2 Objectives and Goals

The Town of Lincoln implements an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its MS4 and implement procedures to prevent such discharges. The ultimate goal is to remove sources of pollution and improve water quality in receiving waterbodies.

5.3 IDDE Program

The following sections outline how Lincoln is meeting the requirements of the 2016 MS4 Permit to implement an IDDE program to locate, eliminate, and prohibit illicit discharges.

5.3.1 Establish Legal Authority

Requirements

Permittees must develop an ordinance, bylaw or regulatory mechanism 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.

Work to be Performed

The Town of Lincoln has established an “Illicit Discharge Control” bylaw under Article XXVIII of the Town’s general bylaws, (adopted May 15, 2021) which addresses all of the above legal requirements in order to create an IDDE program to satisfy the 2016 MS4 Permit, and is provided under **Appendix B**. The following table shows the BMP, responsible parties and measurable goals.

Table 5-1. BMP Description – Establish IDDE Legal Authority

| BMP Description | Responsible Parties | Measurable Goal |
|---------------------------------------|--|---|
| BMP 3-1: Enact and Enforce IDDE Bylaw | Department of Public Works, Health Department, Planning Department | Regulatory mechanism in place within 1 year of the permit effective date. |

5.3.2 Complete System Mapping

Requirements

The 2016 MS4 Permit requires the storm system map to be updated in 2 phases. Phase I mapping must be completed within 2 years of the effective date of the permit (July 1, 2020) and include the following information:

- Outfalls and receiving waters (previously required by the MS4-2003 permit);
- Open channel conveyances (swales, ditches, etc.);
- Interconnections with other MS4s and other storm sewer systems;
- Municipally owned stormwater treatment structures;
- Waterbodies identified by name with a list of impairments as identified on the most recent EPA approved Massachusetts Integrated List of Waters report; and
- Initial catchment delineations based on topography or contributing structures.

Phase II mapping must be completed within 10 years of the effective date of the permit (July 1, 2028) and include the following information:

- Outfall locations (latitude and longitude with a minimum accuracy of +/-30 feet);
- Pipe connectivity;
- Manholes;
- Catch basins;
- Refined catchment delineations based on updated mapping information;
- Municipal sanitary sewer system; and
- Municipal combined sewer system.

Work to be Performed

The Town of Lincoln has mapped much of its stormwater system and current mapping status is provided in **Appendix C**. All information is incorporated into its GIS library and where applicable, GIS information can be exported into other formats. The Town of Lincoln will continue to update its stormwater mapping by the required deadlines to include the above information. The following table shows the BMPs, responsible parties and measurable goals.

Table 5-2. BMP Description – Complete System Mapping

| BMP Description | Responsible Parties | Measurable Goal |
|--|----------------------------|--|
| BMP 3-2: Phase I Storm Sewer System Map | Department of Public Works | Complete preliminary system map within 2 years of effective date of permit |
| BMP 3-3: Phase II Storm Sewer System Map | Department of Public Works | Complete full system map 10 years after effective date of permit |

5.3.3 Complete Sanitary Sewer Overflow Inventory

Requirements

The 2016 MS4 Permit requires municipalities to prohibit illicit discharges, including SSOs, to the separate storm sewer system. SSOs are discharges of untreated sanitary wastewater from a municipal sanitary sewer that can contaminate surface waters, cause serious water quality problems and property damage, and threaten public health. SSOs can be caused by blockages, line breaks, sewer defects that allow stormwater and groundwater to overload the system, power failures, improper sewer design, and/or vandalism.

Work to be Performed

Lincoln’s entire population relies on septic systems for wastewater management. Therefore, SSO considerations do not apply to the Town's program, as noted in the NOI (**Appendix A**).

5.3.4 Develop and Implement Written IDDE Program

Requirements

The Town of Lincoln must develop an IDDE Program, the majority of which is contained in a written Illicit Discharge, Detection, and Elimination Plan, a standalone document separate from this SWMP Plan. The IDDE Plan must include a statement of responsibilities and detailed written procedures for the following:

- Assessment and priority ranking of outfalls and interconnections;
- Dry and wet weather outfall sampling;
- Catchment investigation procedures;
- System vulnerability factor (SVF) assessment;
- Identification of an illicit discharge;
- Illicit discharge removal; and
- Ongoing screening requirements.

Work to be Performed

Lincoln has developed a written IDDE Plan as a separate standalone document to address the illicit discharge requirements of the 2016 MS4 Permit. Lincoln is working towards implementing a comprehensive IDDE Plan and program, according to the schedule set forth in the permit. The following table shows the BMPs, responsible parties and measurable goals.

Table 5-3. BMP Description – Written IDDE Program and Program Implementation

| BMP Description | Responsible Parties | Measurable Goal |
|-------------------------------|---|---|
| BMP 3-4: Written IDDE Program | Department of Public Works, Health Department | Create written IDDE program within 1 year of the effective date of the permit and update periodically |

Table 5-3 (continued). BMP Description – Written IDDE Program and Program Implementation

| BMP Description | Responsible Parties | Measurable Goal |
|---|---|---|
| <u>BMP 3-5:</u> Outfall / Interconnection Inventory and Ranking | Department of Public Works | Classify and rank outfalls and interconnections within 1 year of the effective date of the permit. |
| <u>BMP 3-6:</u> Implement IDDE Program | Department of Public Works, Health Department | Implement catchment investigations and complete within 10 years of the effective date of the permit |

5.3.5 Perform Dry and Wet Weather Outfall Screening

Requirements

Outfalls and contributing catchment areas must be categorized into Problem, High, Low, and Excluded outfalls and then ranked within each category. The 2016 MS4 Permit then requires all outfalls classified as High and Low to be inspected for the presence of dry conditions within 3 years of the permit effective date. While completing screening, permittees must also document various physical indicators of the outfall and sample flowing outfalls. Additionally, outfalls with at least 1 SVF must also be sampled during wet weather. Depending on the results, additional screening and sampling may be required further up into the contributing catchment. Once dry and wet weather sampling is complete, additional ongoing screening shall be performed once every 5 years in accordance with the catchment prioritization and ranking. Both dry and wet weather outfall screening must be conducted in accordance with screening procedures outlined in the written IDDE Plan. All sampling results shall be reported in the permittee’s annual report.

Work to be Performed

The Town of Lincoln developed an outfall sampling program under the IDDE Plan which is being implemented moving forward according to the schedule outlined in the 2016 MS4 Permit. This includes dry weather screening on Town outfalls, with results documented in the standalone IDDE Plan. As SVFs are directly related to the sanitary sewer systems and the Town has no sewer system as of the updated date of this plan, wet weather screening on Town outfalls is not currently required. The program will be performed in accordance with the written procedures and schedules in the IDDE Plan. Ongoing screening will also be performed after the conclusion of the initial sampling rounds. The following table shows the BMPs, responsible parties and measurable goals.

Table 5-4. BMP Description – Perform Dry and Wet Weather Outfall Screening

| BMP Description | Responsible Parties | Measurable Goal |
|---------------------------------------|---|--|
| <u>BMP 3-7:</u> Dry Weather Screening | Department of Public Works, Board of Health | Complete in accordance with outfall screening procedure within 3 years of the effective permit date |
| <u>BMP 3-8:</u> Wet Weather Screening | Department of Public Works, Board of Health | Complete in accordance with outfall screening procedure within 10 years of the effective permit date |

Table 5-4 (continued). BMP Description – Perform Dry and Wet Weather Outfall Screening

| BMP Description | Responsible Parties | Measurable Goal |
|--------------------------------------|---|---|
| <u>BMP 3-9:</u> Ongoing Screening | Department of Public Works, Board of Health | Conduct ongoing dry and wet weather outfall screening upon completion of the IDDE program |

5.3.6 Perform Annual IDDE Training

The 2016 MS4 Permit requires annual IDDE training to be provided to all employees involved in the IDDE program. Therefore, Lincoln provides annual training that at a minimum includes information on how to identify illicit discharges and may also include additional training specific to the functions of particular personnel and their function within the framework of the IDDE program. The Department of Public Works and the Board of Health are the sole municipal departments responsible for implementing the IDDE program, and training focuses on these departments. Frequency and type(s) of training are included in the annual report. The following table shows the BMP, responsible parties and measurable goals.

Table 5-5. BMP Description – Perform Annual IDDE Training

| BMP Description | Responsible Parties | Measurable Goal |
|---|----------------------------|--------------------------|
| <u>BMP 3-10:</u> Perform IDDE Training | Department of Public Works | Complete annual training |

5.4 Measuring IDDE Program Effectiveness

The success of the IDDE Program is evaluated according to the following parameters:

- Storm system mapping progress;
- Number of illicit discharges identified and removed;
- Number and percent of total outfall catchments served by the MS4 evaluated using the catchment investigation procedures;
- Updated SVF and catchment inventory and ranking;
- Dry weather and wet weather screening and sampling results; and
- Number of employees successfully trained on IDDE.

The above items are tracked throughout the year and reported as part of each annual report submitted to EPA each year by September 28.

6 MCM 4: Construction Site Stormwater Runoff Control

6.1 Summary of Permit Requirements

Under MCM 4, permittees are required to implement and enforce a program to reduce pollutants in stormwater runoff discharged to the MS4 from all construction activities that result in a land disturbance of greater than or equal to 1 acre within the regulated area. This program shall also regulate disturbances less than 1 acre if they are part of a larger common plan of development or sale that would disturb 1 or more acres. A summary of the required Construction Site Stormwater Runoff Control Program activities and timelines are provided below:

6.1.1 Legal Authority

The Construction Site Stormwater Runoff Control Program shall include adequate legal authority in the form of a currently effective ordinance, bylaw, or other regulatory mechanism to:

- Require the use of sediment and erosion control practices at construction sites; and
- Include controls for other wastes on construction sites.

For permittees authorized by the MS4-2003 permit such as Lincoln, the ordinance, bylaw, or other regulatory mechanism was required to be effective by May 1, 2008.

6.1.2 Construction Site Stormwater Runoff Control Program

The 2016 MS4 Permit requires preparation of a written Construction Site Stormwater Runoff Control Program procedures that includes pre-construction site plan review and onsite construction inspections. Permittees must also establish requirements for developers to implement a Sediment and Erosion Control Program as part of its Construction Site Stormwater Runoff Control Program that includes BMPs to reduce pollutant sources from construction sites. This program should also include requirements for controlling other wastes during construction.

6.2 Objectives and Goals

The Town of Lincoln implements an effective construction stormwater runoff control program to minimize or eliminate erosion and maintain sediment onsite so that it is not transported in stormwater and allowed to discharge to a water of the U.S through the permittee's MS4.

6.3 Construction Site Stormwater Runoff Control Program

The following sections outline how Lincoln is meeting the requirements of the 2016 MS4 Permit to establish a Construction Site Stormwater Runoff Control Program.

6.3.1 Establish Legal Authority

Requirements

Permittees must develop an ordinance, bylaw or regulatory mechanism to:

- Require the use of sediment and erosion control practices at construction sites;
- Include controls for other wastes on construction sites.

In addition, the bylaw may require updates to address the requirements of the Charles River phosphorus TMDL. See Section 9 for more information.

Work to be Performed

The Town of Lincoln has established a “Construction and Post-Construction Stormwater Management” bylaw under Article XXIX of the Town’s general bylaws, (adopted May 15, 2021) and accompanying “Stormwater Management Rules and Regulations” (adopted July 27, 2021) which regulate construction projects greater than 1 acre and is provided under **Appendix B**. The bylaw and accompanying regulations in part requires use of soil erosion and sediment controls to stormwater runoff at construction sites, and also includes controls for other wastes at construction sites. The following table shows the BMP, responsible parties and measurable goals

Table 6-1. BMP Description – Establish Construction Site Legal Authority

| BMP Description | Responsible Parties | Measurable Goal |
|--|---|--|
| BMP 4-1: Develop and Enforce Construction Bylaw | Conservation Commission, Planning and Land Use, Building Department | Complete bylaw within 1 year of the effective date of the permit |

6.3.2 Establish Written Procedures for Site Plan Review

Requirements

The 2016 MS4 Permit requires establishing written procedures for pre-construction plan review of the site design, planned operations, planned BMPs during the construction phase, and planned BMPs to manage runoff after development that includes the following:

- Potential water quality impacts;
- Consideration of information submitted by the public; and
- Evaluation of opportunities for use of LID and green infrastructure (GI).

Work to be Performed

The Town of Lincoln has established an “Construction and Post-Construction Stormwater Management” bylaw under Article XXIX of the Town’s general bylaws, (adopted May 15, 2021) and accompanying “Stormwater Management Rules and Regulations” (adopted July 27, 2021) which regulate construction projects greater than 1 acre and is provided under **Appendix B**. The bylaw and accompanying regulations in part provide written procedures for reviewing plan submittals, including plans, calculations, and other items as required by the permit. The following table shows the BMP, responsible parties and measurable goals.

Table 6-2. BMP Description – Establish Site Plan Review Procedures

| BMP Description | Responsible Parties | Measurable Goal |
|--|---|---|
| BMP 4-2: Develop Written Procedures for Site Plan Review | Conservation Commission, Planning and Land Use, Building Department | Establish procedures for site plan review within 1 year of the effective date of the permit |

6.3.3 Establish Procedures for Site Inspections and Enforcement

Requirements

The 2016 MS4 Permit requires the development of written procedures for site inspections and enforcement actions to take place both during construction of BMPs and after construction of BMPs is completed to ensure they are working as described in the approved plans. Procedures must define the following:

- Who is responsible for site inspections;
- Qualifications necessary to perform inspections;
- Who has authority to implement enforcement procedures;
- Ability to impose sanctions to ensure program compliance;
- The use of standardized inspection forms (if appropriate); and
- How to track the number inspections and enforcement actions for reporting in the Annual Report.

Work to be Performed

The Town of Lincoln has established an “Construction and Post-Construction Stormwater Management” bylaw under Article XXIX of the Town’s general bylaws, (adopted May 15, 2021) and accompanying “Stormwater Management Rules and Regulations” (adopted July 27, 2021) which regulate construction projects greater than 1 acre and is provided under **Appendix B**. The bylaw and accompanying regulations in part provide written procedures for site inspections, enforcement actions, outlines qualified personnel, and a tracking methodology. The following table shows the BMP, responsible parties and measurable goals.

Table 6-3. BMP Description – Establish Site Inspections and Enforcement Procedures

| BMP Description | Responsible Parties | Measurable Goal |
|--|---|---|
| <u>BMP 4-3:</u> Develop Written Procedures for Site Inspections and Enforcement | Conservation Commission, Planning and Land Use, Building Department | Establish procedures for site inspections and enforcement within 1 year of the effective date of the permit |

6.3.4 Establish a Sediment and Erosion Control Program

Requirements

Permittees must establish 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. Examples of 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;
5. Protect all storm drain inlets and armor all newly constructed outlets;
6. Use perimeter controls at the site;
7. Stabilize construction site entrances and exits to prevent off-site tracking;
8. Inspect stormwater controls at consistent intervals.

Work to be Performed

The Town of Lincoln has established an “Construction and Post-Construction Stormwater Management” bylaw under Article XXIX of the Town’s general bylaws, (adopted May 15, 2021) and accompanying “Stormwater Management Rules and Regulations” (adopted July 27, 2021) which regulate construction projects greater than 1 acre and is provided under **Appendix B**. The bylaw and accompanying regulations in part provide written procedures to prohibit illicit discharge of debris, truck wash-out, litter and sanitary waste control on constructions sites. The following table shows the BMPs, responsible parties and measurable goals.

Table 6-4. BMP Description – Develop an Erosion and Sediment Control Program

| BMP Description | Responsible Parties | Measurable Goal |
|--|---|---|
| <u>BMP 4-4:</u> Procedures for Erosion and Sediment Control | Conservation Commission, Planning and Land Use, Building Department | Establish procedures for development of an erosion and sediment control program within 1 year of the effective date of the permit |
| <u>BMP 4-5:</u> Develop Procedures for Waste Control | Conservation Commission, Planning and Land Use, Building Department | Establish requirements to control construction site wastes within 1 year of the effective date of the permit |

7 MCM 5: Stormwater Management in New Development and Redevelopment

7.1 Summary of Permit Requirements

Under MCM 5, permittees shall develop, implement, and enforce a program to address post-construction stormwater runoff from new development and redevelopment sites that disturb 1 or more acres and discharge into an MS4 system. This program shall also regulate disturbances less than 1 acre if they are part of a larger common plan of development or sale that would disturb 1 or more acres. A summary of the required Stormwater Management in New Development and Redevelopment, also known as Post Construction Stormwater Management, activities and timelines are provided below:

7.1.1 Legal Authority

The Post Construction Stormwater Management Program shall include adequate legal authority in the form of a currently effective ordinance, bylaw, or other regulatory mechanism to:

- Require LID site planning and design strategies;
- Meet many of the requirements of the Massachusetts Stormwater Handbook and associated stormwater standards; and
- Incorporate runoff volume storage and/or pollutant removal requirements.

Updates must be made within 3 years of the effective permit date.

Additionally, the permittee must also establish procedures and requirements for privately maintained facilities that discharge to the MS4 to minimize salt usage and require the use of salt alternatives within the Cambridge Reservoir, Upper Basin, Cambridge Reservoir, Hobbs Brook, and an unnamed tributary as the permittee deems necessary.

7.1.2 As-Built Submittals

The permittee must require the submission of as-built drawings within 3 years after completion of construction projects and include structural and non-structural controls.

7.1.3 Operation and Maintenance

The program must include procedures to ensure adequate long-term operation and maintenance of BMPs are established after completion of a construction project, along with a dedicated funding source within 3 years of the effective permit date.

7.1.4 Regulatory Assessment

The permittee must complete an assessment of existing regulations that could affect creation of impervious cover to determine if changes are required to support LID. Additionally, the permittee must assess current regulations to ensure that certain green infrastructure is

allowable where feasible. Any required changes must be completed within 4 years of the effective permit date.

7.1.5 Inventory of Potential Retrofit Sites

The permittee must complete an inventory within 4 years of the effective permit date to determine at least 5 permittee-owned properties that could be modified or retrofitted with stormwater BMP improvements.

7.2 Objectives and Goals

The Town of Lincoln implements and enforces a program to reduce pollutants in stormwater runoff discharged to the MS4 from all construction activities that result in a land disturbance greater than or equal to 1 acre within the regulated area.

7.3 Post-Construction Stormwater Management Program

The following sections outline how Lincoln is meeting the requirements of the 2016 MS4 Permit to establish a Post-Construction Stormwater Management Program.

7.3.1 Establish Legal Authority

Requirements

Under the 2016 MS4 Permit, permittees shall develop or modify an ordinance, bylaw, or other regulatory mechanism within 3 years of the effective date of the permit to contain provisions that are as least as stringent as the following:

1. Use LID site planning and design strategies unless infeasible;
2. Stormwater management system designs shall be consistent with, or more stringent than, the requirements of the 2008 Massachusetts Stormwater Handbook, as amended;
3. 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 related to the total postconstruction impervious surface area on the site as calculated based on the average annual loading and not on the basis of any individual storm event.
 - a) Average annual pollutant removal requirements 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 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.
4. 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 TSS related to the total post-construction impervious area on the site AND 50% of the average annual load of Total Phosphorus related to the total post-construction impervious surface area on the site as calculated based on the average annual loading and not on the basis of any individual storm event.
- b) Average annual pollutant removal requirements 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.
 - a) 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 are exempt from part a) above. 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 a) above.

Additionally, the bylaw must include requirements for stormwater structural BMPs proposed as part of new or redevelopment to be for shutdown and containment to isolate the system in the event of an emergency spill or other unexpected event within areas draining to Elm Brook and Cambridge Reservoir, Upper Basin. See Section 9 for more information.

Work to be Performed

The Town of Lincoln has established an “Construction and Post-Construction Stormwater Management” bylaw under Article XXIX of the Town’s general bylaws, (adopted May 15, 2021) and accompanying “Stormwater Management Rules and Regulations” (adopted July 27, 2021) which regulate construction projects greater than 1 acre and is provided under **Appendix B**. The bylaw and accompanying regulations in part requires the use of LID techniques as feasible, as well as establishing stormwater standards for TSS and total phosphorus removal for both new development and redevelopment. The following table shows the BMP, responsible parties and measurable goals.

Table 7-1. BMP Description – Establish Post-Construction Site Legal Authority

| BMP Description | Responsible Parties | Measurable Goal |
|--|---|---|
| <u>BMP 5-1</u> : Develop and Enforce Post-Construction Bylaw | Conservation Commission, Planning and Land Use, Building Department | Complete bylaw within 3 years of the effective date of the permit |

7.3.2 Require Submittal of As-Built Plans

The permittee must require the submission of as-built drawings that include structural and non-structural stormwater controls within 3 years after completion of construction projects. The Town of Lincoln has established an “Construction and Post-Construction Stormwater Management” bylaw under Article XXIX of the Town’s general bylaws, (adopted May 15, 2021) and accompanying “Stormwater Management Rules and Regulations” (adopted July 27, 2021) which regulate construction projects greater than 1 acre and is provided under **Appendix B**. The bylaw and accompanying regulations in part requires the submittal of as-built plans prior to the completion of a project. The following table shows the BMPs, responsible parties and measurable goals.

Table 7-2. BMP Description – Require Submittal of As-Built Plans

| BMP Description | Responsible Parties | Measurable Goal |
|---|---|---|
| <u>BMP 5-2</u> : Require Stormwater As-Built Plan Submittal | Conservation Commission, Planning and Land Use, Building Department | Require submittal of as-built plans for completed projects within 3 years of completion |

7.3.3 Require Long Term Operation and Maintenance

As part of its Post Construction Stormwater Management Program, the Town of Lincoln shall develop procedures to ensure that the adequate long-term operation and maintenance of BMPs is accounted for at the conclusion of a construction project, along with a dedicated funding source, within 3 years of the effective permit date. The Town of Lincoln has established an “Construction and Post-Construction Stormwater Management” bylaw under Article XXIX of the Town’s general bylaws, (adopted May 15, 2021) and accompanying “Stormwater Management Rules and Regulations” (adopted July 27, 2021) which regulate construction projects greater than 1 acre and is provided under **Appendix B**. The bylaw and

accompanying regulations in part requires preparation of comprehensive operation and maintenance plans prior to the completion of a project. The following table shows the BMPs, responsible parties and measurable goals.

Table 7-3. BMP Description – Require Long Term Operation and Maintenance Plans

| BMP Description | Responsible Parties | Measurable Goal |
|---|---|---|
| BMP 5-3: Require Long Term Operation and Maintenance | Conservation Commission, Planning and Land Use, Building Department | Require submittal of operation and maintenance plans and dedicated funding to ensure long term maintenance within 3 years of the effective date of the permit |

7.3.4 Complete Regulatory Assessment

Requirements

The 2016 MS4 permit requires permittees to complete a report that assesses current street design, parking lot guidelines, and other local requirements that could affect creation of impervious cover to determine if changes to existing design standards are required to support LID. 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. Any required changes to reduce mandatory creation of impervious cover in support of LID should be made within 4 years of the effective permit date.

Additionally, the permittee must complete a report that assesses current regulations to determine the feasibility of allowing green roofs, infiltration practices, porous/pervious pavement, and water harvesting/storage devices where feasible. The assessment must indicate if the practices are allowed in the MS4 area and under what circumstances they are 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. Any required changes to allow for these BMPs must be completed within 4 years of the effective permit date.

Work to be Performed

The Town of Lincoln completed a comprehensive review of its regulations to address the above requirements during Permit Year 4. A report (**Appendix D**) was developed that in part includes an assessment of requirements that affect creation of impervious cover, if design standards for streets and parking lots can be modified to better support LID options, and assesses the feasibility of making green infrastructure allowable when appropriate site conditions exist. Recommendations have been provided to the planning board, although no schedule has been developed to date. A detailed schedule is anticipated to be completed during Year 5 and beyond in cooperation with the Responsible Parties listed in the table below. The following table shows the BMPs, responsible parties and measurable goals.

Table 7-4. BMP Description – Complete LID and GI Regulatory Updates

| BMP Description | Responsible Parties | Measurable Goal |
|---|---|--|
| <u>BMP 5-4:</u> Street design and parking lot guidelines | Conservation Commission, Planning and Land Use, Building Department | Complete regulatory updates within 4 years of the effective date of the permit |
| <u>BMP 5-5:</u> Allow green infrastructure | Conservation Commission, Planning and Land Use, Building Department | Complete regulatory updates within 4 years of the effective date of the permit |

7.3.5 Complete Inventory of Potential BMP Retrofit Sites

Requirements

Permittees must complete an inventory of at least 5 existing permittee-owned properties that could be modified or retrofitted with structural stormwater BMP improvements to reduce the frequency, volume, and pollutant loads within 4 years of the effective permit date. The inventory provided in **Appendix E** should include municipal properties with significant impervious cover such as parking lots, buildings, and maintenance yards, along with infrastructure such as existing rights-of-way, outfalls and stormwater conveyances such as swales or detention practices. The permittee should address potential site constraints that could hinder BMP construction, such as subsurface conditions, depth to water table, and utility impacts, and should ideally allow opportunities for public education. In addition, the inventory must consider BMPs to reduce phosphorus discharges because of the phosphorus impairment to the Charles River.

Beginning with the fifth annual report, should BMPs at 1 or more sites be constructed, the inventory should be updated so that it always contains at least 5 sites in the inventory for potential improvement. Additionally, the permittee must report on all properties that have been modified or retrofitted to mitigate impervious area.

Work to be Performed

The Town of Lincoln developed a comprehensive inventory and ranking (**Appendix E**) of all town-owned parcels within the regulated urbanized area that had impervious cover such as parking lots or buildings, or were located along/adjacent to roadways. This largely included all town-owned parcels present within the urbanized area with the exception of vacant conversation areas. The Town then conducted a desktop analysis of all parcels to assess them for potential BMP retrofit opportunities by reviewing relevant information such as available space, localized topography, soil types, opportunities to reroute existing drainage networks, etc. All properties were then evaluated in the field to further refine desktop assessments and were then ranked based on existing conditions and feasibility of retrofitting to improve water quality. The top five sites for potential BMP retrofit were then identified and pre-conceptual designs with costs were prepared for top sites. This inventory will be updated continuously starting in Year 5 as necessary. The following table shows the BMP, responsible parties and measurable goals.

Table 7-5. BMP Description – Complete Inventory of Properties for BMP Retrofit

| BMP Description | Responsible Parties | Measurable Goal |
|---|---|---|
| <u>BMP 5-6</u> : Target properties to reduce impervious areas | Conservation Commission, Planning and Land Use, Building Department | Complete inventory within 4 years of the effective date of the permit and update annually on retrofitted properties |

8 MCM 6: Good Housekeeping and Pollution Prevention

8.1 Summary of Permit Requirements

Under MCM 6, permittees shall develop and implement an operations and maintenance program to reduce stormwater pollution from permittee activities. This includes optimizing existing activities related to parks and open space, buildings and facilities, vehicles and equipment, and stormwater infrastructure maintenance. A summary of the required Good Housekeeping and Pollution Prevention for Permittee Owned Operations activities and timelines is provided below.

8.1.1 Operations and Maintenance Programs

Permittees shall develop written operations and maintenance procedures for parks and open space, buildings and facilities, vehicles and equipment, winter road maintenance, stormwater infrastructure, and structural stormwater BMPs within 2 years of the effective permit date. This program shall also optimize catch basin cleaning and street sweeping, along with establishing proper storage techniques for cleaning residuals. All maintenance activities, inspections, and training shall be logged for annual reporting.

8.1.2 Stormwater Pollution Prevention Plans

Develop and implement Stormwater Pollution Prevention Plans (SWPPPs) for municipally-owned maintenance garages, public works yards, transfer stations within 2 years of the effective permit date.

8.2 Objectives and Goals

The Town of Lincoln implements an effective good housekeeping, pollution prevention, and operation and maintenance program with a goal of preventing or reducing pollutant runoff, protecting water quality from municipal operations, and maintain its infrastructure in good working order.

8.3 Good Housekeeping and Pollution Prevention Program

The following sections outline how Lincoln is meeting the requirements of the 2016 MS4 Permit to establish a Good Housekeeping and Pollution Prevention Program.

8.3.1 Complete Facilities O&M Procedures

Requirements

The permittee must complete an inventory of all parks and open space, buildings and facilities where pollutants are exposed to stormwater runoff, including those coming from vehicles and equipment, within 2 years of the permit effective date. The inventory must be reviewed annually and updated as necessary. Upon completion, the permittee must establish written procedures as part of an Operation and Maintenance Plan within 2 years of the permit effective date for the following items:

Parks and Open Space

- Proper use, storage, and disposal of pesticides, herbicides, and fertilizers;
- Lawn maintenance and landscaping activities to protect water quality, such as reducing mowing, lawn clippings handling, and use of alternative materials;
- Pet waste handling collection and disposal locations at all locations where pets are permitted, including signage;
- Control of waterfowl in areas where they congregate to reduce waterfowl droppings from entering the MS4s;
- Management of trash containers; and
- Addressing erosion or poor vegetative cover, particularly near a surface waterbody.

Buildings and Facilities

- Use, storage, and disposal of petroleum products and other potential pollutants.
- Materials handling training to applicable employees;
- Ensuring that Spill Prevention, Control, and Countermeasures (SPCC) Plans are in place if needed (aboveground petroleum storage greater than 1,320 gallons or underground petroleum storage greater than 42,000 gallons);
- Dumpsters and other waste management equipment; and
- Sweeping parking lots and keeping facility areas clean to reduce pollutants in runoff.

Vehicles and Equipment

- Storage of vehicles to prevent fluid leaks to stormwater;
- Fueling area evaluation, including feasibility of fueling under cover; and
- Preventing vehicle wash waters from entering surface waters or the MS4.

Work to be Performed

The Town has prepared a comprehensive written O&M Plan, a standalone document separate from this SWMP Plan, that meets the above requirements. This document also includes the inventory of relevant Town-owned properties. In addition, the Town's O&M established requirements for use of slow release fertilizers and phosphorus-free on permittee owned properties and establish procedures to manage grass cuttings and leaf litter on permittee property within areas of town draining to the Charles River watershed, a waterbody impaired for phosphorus. The following table shows the BMP, responsible parties and measurable goals.

Table 8-1. BMP Description – Complete Written Facilities O&M Procedures

| BMP Description | Responsible Parties | Measurable Goal |
|--|--|--|
| <u>BMP 6-1</u> : Inventory open spaces, buildings and facilities, and vehicles and equipment | Department of Public Works, Parks and Recreation Department, Building Department | Complete inventory of open spaces, buildings and facilities, and vehicles and equipment within 2 years of the effective date of the permit |
| <u>BMP 6-2</u> : Establish Operation and Maintenance Procedures | Department of Public Works, Parks and Recreation Department, Building Department | Create written O&M Plan for open spaces, buildings and facilities, and vehicles and equipment within 2 years of the effective date of the permit |

8.3.2 Complete Infrastructure O&M Procedures

Requirements

The permittee must establish written procedures as part of an Operation and Maintenance Plan within 2 years of the permit effective date to ensure that MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4 for the following items:

Street Sweeping (Appendix F)

- Sweeping all streets and permittee-owned parking lots, with the exception of rural uncurbed roads with no catch basins or high-speed limited access highways at least 1 per year in the spring following winter sanding events;
- More frequent sweeping of targeted areas based on inspections, land use, or known water quality impacts;
- Increasing street sweeping frequency of all municipal owned streets and parking lots to a minimum of 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) for areas within phosphorus or nitrogen-impaired watersheds; and
- For rural uncurbed roadways with no catch basins or limited access highways, either an evaluation to meet the minimum frequencies above or development and implementation of an inspection, documentation, and targeted sweeping plan within 2 years of the effective date and submitted with the Year 1 annual report.

Catch Basin Cleaning (Appendix G)

- Prioritization of catch basins located near construction activities for more frequent inspection and maintenance;
- Establishing a schedule with a goal that at the time of maintenance, no catch basin is more than 50% full;
- For catch basins that are more than 50% full during 2 consecutive inspections or cleaning events, methods for investigating the contributing drainage area for sources of excessive sediment loads; and
- Establishing a plan for optimizing catch basin cleaning, inspections, and documentation.

Catch Basin and Street Sweeping Residuals Management

- Ensure proper storage of catch basins cleanings and street sweepings prior to disposal or reuse such that they are not discharged to receiving waters based on available MassDEP policies.

Winter Operation and Maintenance

- Establish and implement procedures for winter road maintenance including the use and storage of salt and sand
- Minimizing use of sodium chloride and other salts and evaluation of opportunities to use alternative materials; and
- Ensuring that snow disposal activities do not result in disposal of snow into waters of the United States.

Work to be Performed

The Town recently updated its existing street sweeping, catch basin cleaning, and winter O&M procedures in order to meet permit requirements. Street sweeping will continue under the existing Street Sweeping Prioritization Plan provided in **Appendix F** for the foreseeable future. Catch basin prioritization will also continue for the next several years as catch basin inspections continue according to the methodology and schedule outlined in the Catch Basin Optimization Plan provided in **Appendix G**. The following table shows the BMP, responsible parties and measurable goals.

Table 8-2. BMP Description – Complete Written Infrastructure O&M Procedures

| BMP Description | Responsible Parties | Measurable Goal |
|---|----------------------------|--|
| <u>BMP 6-3</u> : Review Infrastructure O&M Procedures | Department of Public Works | Create written O&M Plan for stormwater infrastructure within 2 years of the effective date of the permit |
| <u>BMP 6-4</u> : Catch Basin Cleaning | Department of Public Works | Clean catch basins on established schedule and report number of catch basins cleaned and volume of material moved annually |
| <u>BMP 6-5</u> : Street Sweeping | Department of Public Works | Sweep all streets and parking lots at least annually |
| <u>BMP 6-6</u> : Road salt optimization program | Department of Public Works | Implement salt use optimization during winter maintenance operations |

8.3.3 Stormwater Pollution Prevention Plans

Requirements

The permittee must establish written Stormwater Pollution Prevention Plans for 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. SWPPPs must address a number of components, including the following:

- Pollution Prevention Team;
- Facility description, identification of potential pollutant sources, and identification of stormwater controls;
- Stormwater management practices, including measures to minimize or prevent exposure, good housekeeping and preventative maintenance, spill prevention and response, erosion and sediment control, management of runoff, salt storage, employee training, and control measure maintenance; and
- Procedures for site inspections and sampling.

Work to be Performed

The Town of Lincoln has determined that it has one facility that meets the above requirements, the DPW Garage. A SWPPP has been prepared for this facility as a separate standalone document which should be updated when there is a significant change in design, construction, operation, or maintenance of the facility that affects the discharge or potential discharge of pollutants. This SWPPP is made available in hardcopy at the Lincoln DPW Garage to members of federal, state, or local agencies during normal working hours for review upon request. Copies of the SWPPP are accessible to all persons responsible for implementing and administering it. The following table shows the BMP, responsible parties and measurable goals.

Table 8-3. BMP Description – Prepare SWPPPs for Regulated Facilities

| BMP Description | Responsible Parties | Measurable Goal |
|--|---|--|
| <u>BMP 6-7:</u> Assess regulated facilities to determine SWPPP eligibility | Department of Public Works | Complete facilities assessment within 2 years of the effective date of permit. |
| <u>BMP 6-8:</u> Develop SWPPPs for applicable facilities | Department of Public Works | Complete and implement within 2 years of the effective date of the permit |
| <u>BMP 6-9:</u> Spill Prevention and Response Training | Department of Public Works, Fire Department | Train employees involved with spill prevention and response annually |

8.3.4 Structural Stormwater BMP Inspections

Requirements

The permittee must establish and implement written inspection and maintenance procedures and frequencies for all stormwater treatment structures, such as infiltration and detention basins, proprietary stormwater treatment structures, gravel wetlands, etc. at least annually.

Work to be Performed

The Town of Lincoln completed an inventory (**Appendix H**) of known structural stormwater BMPs by the end of Year 2 as required by MCM 3, mapping requirements. The Town also developed inspection and maintenance procedures for the various types of BMPs located within the Town’s regulated area. BMP inspection Standard Operating Procedures (SOPs) and logs for BMP inspection and maintenance are provided in the standalone O&M

Plan. Stormwater BMPs are inspected annually, with results documented in **Appendix H**. The following table shows the BMP, responsible parties and measurable goals.

Table 8-4. BMP Description – Inspect Structural BMPs Annually

| BMP Description | Responsible Parties | Measurable Goal |
|--|----------------------------|--|
| <u>BMP 6-10</u> : Establish BMP O&M Procedures | Department of Public Works | Create written O&M Plan for stormwater BMPs within 2 years of the effective date of the permit |
| <u>BMP 6-11</u> : Inspect and maintain stormwater BMPs | Department of Public Works | Inspect and maintain treatment structures annually |

9 TMDL and Impaired Waters Controls

9.1 Permit Requirements

The 2016 MS4 Permit requires regulated operators of MS4s to determine whether stormwater discharges from their MS4 contribute to any impaired waterbodies, including those subject to an approved TMDL and certain water quality limited waterbodies. Water quality limited waters are any waterbodies that do not meet applicable water quality standards, including waterbodies listed in categories “4a” and “5” on the Massachusetts Integrated List of Waters, also known as the “303(d) List”. MassDEP is responsible for preparing TMDLs for many of these listed waters to identify the problem pollutant and establish water quality goals. TMDLs are prepared based on the priority assigned to the waterbody and are completed over the course of several years.

As outlined in Section 2.3, the Town of Lincoln is subject to the following TMDL and impaired waters requirements:

Table 9-1. TMDL and Impaired Waters Requirements

| Waterbody Name | Impairment | 2016 Permit Requirements |
|----------------------------------|------------------------------------|--------------------------|
| Charles River | Phosphorus | Appendix F, Part A.I |
| Elm Brook | Fecal Coliform Escherichia coli | Appendix F, Part A.III |
| Shawsheen River | Fecal Coliform Escherichia coli | Appendix F, Part A.III |
| Cambridge Reservoir, Upper Basin | Chloride | Appendix H, Part IV |
| Cambridge Reservoir | Chloride | Appendix H, Part IV |
| Hobbs Brook | Chloride | Appendix H, Part IV |
| Unnamed Tributary | Chloride | Appendix H, Part IV |
| Elm Brook | Sedimentation/ Siltation | Appendix H, Part V |
| Cambridge Reservoir, Upper Basin | Turbidity | Appendix H, Part V |

Thus, the Town of Lincoln must implement control measures for discharges to approved TMDL waters and to impaired waters without a TMDL as summarized in the sections below. The Town reviews the most recent approved list of impaired waters as it is released and outline any additional requirements associated with the most recent list. Progress towards meeting the Charles River Phosphorus TMDL requirements is documented in the standalone Phosphorus Control Plan document. Progress towards meeting the chloride impaired waters requirements is documented in the standalone Salt Reduction Plan.

9.2 Charles River Phosphorus TMDL Requirements

To address the discharge of phosphorus from its MS4, the Town of Lincoln must develop a Phosphorus Control Plan (PCP) designed to reduce the amount of phosphorus in stormwater discharges from its MS4 to the Charles River and its tributaries. This Plan shall be

completed in 3 phases and should be fully implemented as soon as possible but no later than 20 years after the permit effective date. The timing of each phase over 20 years from the permit effective date is outlined in the following table.

Table 9-2. Phosphorus Control Plan Phase Schedule

| Years 1-5 | Years 6-10 | Years 11-15 | Years 16-20 |
|---------------------|---------------------|---------------------|-------------------|
| Create Phase 1 Plan | Implement Phase 1 | | |
| | Create Phase 2 Plan | Implement Phase 2 | |
| | | Create Phase 3 Plan | Implement Phase 3 |

The following provides a brief summary of permit requirements to be implemented:

9.2.1 Phase 1 Requirements

The Phase 1 Plan of the Lincoln PCP will contain the following elements by the following required milestones:

- Item 1 Legal Analysis** – Identify regulatory mechanisms that may be necessary to implement the PCP, complete a legal analysis within 2 years of the permit effective date, and adopt changes by the end of the permit term.
- Item 2 Funding Source Assessment** – Identify funding mechanisms that will be used to fund PCP implementation, describe the steps to be taken in implementing the funding plan, and complete funding source assessment within 3 years of permit effective date.
- Item 3 Define PCP Scope, Baseline Load, Reduction Requirement, and Allowable Load** – Determine whether to implement the PCP town wide or only in the UA and select the corresponding Baseline Phosphorus Load, Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load corresponding to the PCP Area selected as follows:

Table 9-3. Phosphorus Load Reduction Options

| Phosphorus Load | Baseline Watershed (kg/yr) | Stormwater Reduction Requirement (kg/yr) | Allowable (kg/yr) | Stormwater Percent Reduction (%) |
|-----------------|----------------------------|--|-------------------|----------------------------------|
| Town-Wide | 593 | 101 | 492 | 17% |
| UA-Only | 366 | 63 | 303 | 17% |

Note that although the UA-Only option has a lower reduction requirement, there are also less options to implement BMPs as the available area of town is smaller. This requirement should be completed within 4 years of permit effective date

- Item 4 Non-Structural Controls** – Determine non-structural stormwater controls to help reduce phosphorus, including planned measures, areas where measures

will be implemented, and expected annual phosphorus reductions within 5 years of effective permit date. Non-structural BMPs fully implemented within 6 years of the permit effective date.

- Item 5 Structural Controls** – Priority rank areas and infrastructure where potential structural phosphorus controls could be implemented, including an assessment of site suitability for phosphorus control measures based on soil types and other factors, within 5 years of effective permit date.
- Item 6 Operation and Maintenance Program** – Establish an O&M Program for current and planned structural BMPs, including an inspection and maintenance schedule with program or department responsible within 5 years of effective permit date.
- Item 7 Written Plan** – Prepare a written plan to determine implementation cost estimate, and schedule that addresses the above items within 5 years of the effective permit date.
- Item 8 Implementation and Performance Evaluation** – Structural BMPs must be designed and constructed per the 8 and 10-year milestones outlined in the permit. Phase 1 shall be fully implemented no later than 10 years after the effective date of permit. Phosphorus loading increases and reductions must be evaluated annually.

9.2.2 Phase 2 Requirements

Phase 2 requirements generally follow much of Phase 1 as follows:

- Item 1 – Legal Analysis must be completed as necessary
- Item 4 – Non-Structural Controls, Item 5 – Structural Controls, Item 6 – O&M Program, and Item 7 – Written Plan must be completed within 10 years of the effective permit date.
- Item 8 – Implementation and Performance Evaluation must follow the schedule outlined above, adding 5 years onto each milestone for implementation.

9.2.3 Phase 3 Requirements

Phase 3 requirements generally follow much of Phase 1 as follows:

- Item 1 – Legal Analysis must be completed as necessary
- Item 4 – Non-Structural Controls, Item 5 – Structural Controls, Item 6 – O&M Program, and Item 7 – Written Plan must be completed within 15 years of the effective permit date.
- Item 8 – Implementation and Performance Evaluation must follow the schedule outlined above, adding 10 years onto each milestone for implementation.

9.2.4 Reporting

The Town of Lincoln shall include a progress report in each Annual Report on the planning and implementation of the PCP. Once the PCP has started implementation 5 years after the permit effective date, the Annual Report shall also include the following:

- Non-structural control measures implemented during the reporting year along with the calculated phosphorus reduction;
- Structural control measures implemented during the reporting year with location information, calculated phosphorus reduction, and date of last inspection and maintenance;
- Phosphorus load increases due to development; and
- Estimated yearly phosphorus export rate accounting for development and implementation of both non-structural and structural BMPs.

Work to be Performed

Requirements for meeting the Charles River TMDL requirements are being performed according to the schedule in the 2016 Permit. Progress towards meeting the Charles River Phosphorus TMDL requirements is documented in the standalone Phosphorus Control Plan document. The following table shows the BMP, responsible parties and measurable goals.

Table 9-4. TMDL Requirements – Charles River Phosphorus

| BMP Description | Responsible Parties | Measurable Goal |
|---|---|--|
| BMP 7-1: TMDL Requirements – Charles River Phosphorus | Department of Public Works, Conservation Commission | Adhere to requirements in part A.F of Appendix F |

9.3 Fecal Coliform and E.coli TMDL Requirements

The Town of Lincoln currently has 2 waterbodies, Elm Brook and the Shawsheen River, with an approved TMDL for fecal coliform and E.coli. Thus, the Town is required to implement the following requirements as outlined under Appendix F, Part III of the 2016 Permit.

9.3.1 Additional or Enhanced BMPs

The Town of Lincoln must include the following additional or enhanced BMPs, in addition to the 6 MCMs outlined previously:

- **Public Education** – supplement its Residential program with an annual message encouraging the proper management of pet waste and disseminate educational materials to dog owners at the time of issuance or renewal of a dog license. 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 Town also must provide information to owners of septic systems

about proper maintenance in any catchment that discharges to a water body impaired for bacteria or pathogens.

- **Illicit Discharge, Detection, and Elimination** – designate catchments draining to bacteria or pathogen impaired segments as “Problem Catchments” or “High” priority.

Work to be Performed

Public education requirements have been incorporated into public education outreach components as described in Section 3. IDDE requirements have been incorporated into Lincoln’s IDDE Plan. The following table shows the BMP, responsible parties and measurable goals.

Table 9-5. TMDL Requirements – Fecal Coliform

| BMP Description | Responsible Parties | Measurable Goal |
|---|---|--|
| <u>BMP 7-2</u> : TMDL Requirements – Fecal Coliform | Department of Public Works, Conservation Commission | Adhere to requirements in part A.III of Appendix F |

9.4 Chloride Water Quality Limited Waterbodies Requirements

The Town of Lincoln has 4 water quality limited waterbodies, Cambridge Reservoir Upper Basin, Cambridge Reservoir, Hobbs Brook, and an Unnamed Tributary listed as impaired for chlorides. Thus, the Town must implement the following requirements as outlined under Appendix H, Part IV of the 2016 Permit.

9.4.1 Additional or Enhanced BMPs

The Town of Lincoln must include the following additional or enhanced BMPs, in addition to the 6 MCMs outlined previously:

- **Develop a Salt Reduction Plan** – The Town will 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 within three years of the effective date of the permit and implement the plan within five years. Planned activities for salt reduction on municipal facilities may include but are not limited to:
 - 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;
 - Regular calibration of spreading equipment;

- Designation of no-salt and/or low salt zones; and
- Measures to prevent exposure of salt stockpiles (if any) to precipitation and runoff.

The plan should include an estimate of the total tonnage of salt reduction expected by each activity and a schedule for implementation of planned activities. The completed plan must be submitted to EPA along with the annual report following the Salt Reduction Plan's completion, and each annual report must provide an update on progress made.

- **Public Education** – supplement the educational program with an annual message to private road salt applicators, commercial, and industrial site owners on proper storage and application rates of winter deicing material and steps that can be taken to minimize salt use in the November/December timeframe.
- **Stormwater Management in New Development and Redevelopment** – establish procedures and requirements to minimize salt usage and require use of salt alternatives where determined necessary.
- **Regulatory Mechanism** – establish a regulatory mechanism requiring measures to prevent exposure of any salt stockpiles to precipitation and runoff at all privately owned commercial and industrial properties;
- **Tracking** – The Town of Lincoln must track the amount of salt applied to all municipally owned and maintained surfaces and reporting of salt use during annual reporting once the Salt Reduction Plan has been completed.

Work to be Performed

The four waterbodies listed above were not originally listed as impaired for chloride in the 2016 MS4 Permit. Rather, they were added as part of the 2018/2020 303(d) impaired waters update, which means the Town had three years to prepare a Salt Reduction Plan. This Plan was prepared in 2023 according to the required schedule outlined in the permit. Additionally, public education requirements were previously incorporated into the Town's approach towards meeting MCM 1. Stormwater development is also regulated under the Town's existing construction and post-construction requirements outlined under MCM 4 and MCM 5. Lastly, the Town tracks salt applied to municipally-owned surfaces as part of annual reporting requirements.

As noted in Section 2.3, land use within the Town of Lincoln is largely limited to low-density residential and otherwise undeveloped land, with only approximately 7% allocated towards commercial and industrial uses. Furthermore, the watersheds within the Town of Lincoln boundaries corresponding to Cambridge Reservoir and the unnamed tributary which flows into Cambridge Reservoir are located along the extreme eastern edge of the Town which is exclusively comprised of low density residential and other undeveloped areas. Approximately half of the Hobbs Brook watershed is located outside of the urbanized area, with almost all of the remainder occupied by low density residential and other undeveloped land. The only exception is the extreme northern end of the watershed where Hanscom Air

Force Base is located which is subject to a separate standalone MS4 Permit and thus is not considered part of Lincoln’s program. Additionally, there are no known salt stockpiles and minimal, if any, commercial and industrial properties located within chloride-impaired watersheds.

At this time, the Town does not envision the need to enact new regulations or procedures for salt within new and redevelopment and/or commercial/industrial properties, as virtually none exist. The following table shows the BMP, responsible parties and measurable goals.

Table 9-6. Water Quality Limited Waterbody Requirements – Chloride

| BMP Description | Responsible Parties | Measurable Goal |
|--|---|---|
| BMP 7-3: Water Quality Limited Waterbody Requirements – Chloride | Department of Public Works, Conservation Commission | Adhere to requirements in part A.IV of Appendix H |

9.5 Turbidity Water Quality Limited Waterbodies Requirements

The Town of Lincoln has 2 water quality limited waterbodies, Elm Brook and Cambridge Reservoir, Upper Basin, listed as impaired for turbidity. Thus, the Town must implement the following requirements as outlined under Appendix H, Part V of the 2016 Permit.

9.5.1 Additional or Enhanced BMPs

The Town of Lincoln must include the following additional or enhanced BMPs, in addition to the 6 MCMs outlined previously:

- 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. Any stormwater management system designed to infiltrate stormwater on commercial or industrial sites must 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.
- Good Housekeeping and Pollution Prevention** – increase street sweeping frequency of all municipal streets and parking lots to target areas with potential for high pollutant loads. This may include increased sweeping in commercial and high-density residential areas, or largely impervious drainage areas. Prioritize inspection and maintenance for catch basins to ensure that no sump is more than 50 percent full. Clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings. Include street sweeping schedule developed to target high pollutant loads in each annual report.

Work to be Performed

Stormwater management requirements for new and redevelopment were addressed as part of the regulatory and other program updates to be completed during Year 3. The Town of Lincoln has addressed street sweeping requirements under Section 8.2. The catch basin cleaning program is ongoing as outlined under Section 8.2. The following table shows the BMP, responsible parties and measurable goals.

Table 9-7. Water Quality Limited Waterbody Requirements – Turbidity

| BMP Description | Responsible Parties | Measurable Goal |
|---|---|--|
| <u>BMP 7-4</u> : Water Quality Limited Waterbody Requirements – Turbidity | Department of Public Works, Conservation Commission | Adhere to requirements in part A.V of Appendix H |

10 Annual Reporting

The permittee shall submit annual reports each year of the permit term. The reporting period is 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, 2018 to the permit effective date. The annual report is due 90 days from the close of each reporting period, or by September 28 of each year. The annual reports must contain the following relevant information which should be tracked throughout the year, and should be filed within **Appendix I**:

- A self-assessment review of compliance with the permit terms and conditions.
- An assessment of the appropriateness of the selected BMPs.
- The status of any plans or activities, including:
 - Identification of all discharges determined to be causing or contributing to an exceedance of water quality standards and description of response;
 - For discharges subject to TMDL or water quality limited waterbody requirements, identification of BMPs used to address the impairment and assessment of the BMPs effectiveness;
 - For discharges to water quality limited waters a description of each BMP and any deliverables required.
- An assessment of the progress towards achieving the measurable goals and objectives of each of the 6 minimum measures:
 - Evaluation of the public education program including a description of the targeted messages for each audience; method 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 IDDE activities including: status of mapping and results of the ranking and assessment; identification of problem catchments; status of all IDDE Plan components; number and identifier of catchments evaluated; number and identifier of outfalls screened; number of illicit discharges located and removed; gallons of flow removed; identification of tracking indicators and measures of progress; and employee training.
 - Evaluation of construction runoff management including number of project plans reviewed; number of inspections; and number of enforcement actions.
 - Evaluation of stormwater management for new and redevelopment including status of bylaw development; review and status of the street design and barriers to green infrastructure assessment; and inventory status.
 - Status of the O&M Programs.
 - Status of SWPPPs, including inspection results.
- All outfall screening and monitoring data during the reporting period and cumulative for the permit term; and a description of any additional monitoring data received by the permittee during the reporting period.
- Description of activities for the next reporting cycle.
- Description of any changes in identified BMPs or measurable goals.
- Description of activities undertaken by any entity contracted for achieving any measurable goal or implementing any control measure.

11 Implementation of Best Management Practices

The Town of Lincoln's Best Management Practices Plan as outlined in the Town's NOI (**Appendix A**) is summarized in **Table 11-1**.

For consistency with the 6 MCMs and impaired water requirements, the BMPs are broken down into 7 categories:

1. Public Education and Outreach;
2. Public Participation and Involvement;
3. Illicit Discharge Detection and Elimination;
4. Construction Site Stormwater Runoff Control;
5. Stormwater Management in New Development and Redevelopment;
6. Good Housekeeping and Pollution Prevention; and
7. TMDL and Water Quality Limited Waterbodies Controls

The BMP tables also outline the measurable goals for each BMP to gauge permit compliance, the responsible party(ies) for implementing each BMP, and an implementation schedule to be used throughout the permit period. In addition to implementation of activities outlined in this plan, the Town also performs the following activities throughout the duration of the permit:

1. **Program Evaluation** – conduct annual evaluations of the Stormwater Management Program for compliance with permit conditions. The evaluation must include a determination of the appropriateness of the selected BMPs in efforts towards achieving the measurable goals outlined in **Table 11-1**.
2. **Record Keeping** – maintain records that pertain to the Stormwater Management Program for a period of at least 5 years. Records need to be made available to the public and the Town may charge a reasonable fee for copying. Records need not be submitted to EPA or MassDEP unless specifically requested.
3. **Reporting** – submit an annual report to EPA and MassDEP, including the information as noted in Section 10.

Refer to the following link for a copy of the 2016 MA MS4 Permit:

<https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit>

Table 11-1. Proposed BMP Plan - Implementation of Phase II Activities

| BMP ID | BMP Description | Implementation | Responsible Dept./Person | Measurable Goal | Report Section | Year / Schedule | | | | |
|---|--|--|---|---|----------------|-----------------|---------------|---------------|---------------|---------|
| | | | | | | 1 | 2 | 3 | 4 | 5+ |
| | | | | | | 7/1/18-7/1/19 | 7/1/19-7/1/20 | 7/1/20-7/1/21 | 7/1/21-7/1/22 | 7/1/22- |
| 1. Public Education and Outreach | | | | | | | | | | |
| 1-1 | Residential Education Program | 1. Provide relevant stormwater information to different audiences via various social media platforms | Information Technology | Follow statewide “Think Blue” campaign on social media platforms | 3.4.1 | * | * | * | * | * |
| | | 2. Provide fact sheets on pet waste management with all dog registrations and renewals | Town Clerk | Provide information with all applications and renewals | | * | * | * | * | * |
| | | 3. Distribute flyers regarding stormwater awareness at Town Hall and town events. | Conservation Commission | Continue to provide information at Town Hall and public town events. Distribute brochures to residents. | | * | * | * | * | * |
| | | 4. Provide education regarding stormwater definitions, control, impacts, and influences through articles in the local newspaper | Conservation Commission | Write at least one article per year | | * | * | * | * | * |
| | | 5. Provide homeowner and contractor manual with BMPs for ecological design, construction, and maintenance | Conservation Commission, Information Technology | Continue to provide manual and updates with best current methods | | * | * | * | * | * |
| | | 6. Distribute stormwater flyers to new residents as part of a welcome packet to engage them with stormwater issues | Conservation Commission, Town Clerk | Continue to provide information to all new homeowners | | * | * | * | * | * |
| | | 7. Provide comprehensive stormwater information on the Town's website, including effects of outdoor activities such as lawn care 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; and maintenance of septic systems. | Information Technology, Conservation Commission | Continue to update and maintain the websites | | * | * | * | * | * |
| 1-2 | Businesses, Institutions, and Commercial Education Program | 1. Provide comprehensive stormwater information on the Town's website, including effects of outdoor activities such as lawn care on water quality; benefits of appropriate on-site infiltration of stormwater; building maintenance and storage of materials; proper use and storage of salt or other de-icing and anti-icing materials; proper management of waste materials and dumpsters; proper management of parking lot surfaces; proper car care activities; and proper disposal of swimming pool water by entities such as motels, hotels, and health and country clubs. | Information Technology, Conservation Commission | Continue to update and maintain the websites | 3.4.2 | * | * | * | * | * |
| | | 2. Provide relevant stormwater information to different audiences via various social media platforms | Information Technology | Follow statewide “Think Blue” campaign on social media platforms | | * | * | * | * | * |
| 1-3 | Developer and Construction Education Program | 1. Provide homeowner and contractor manual with BMPs for ecological design, construction, and maintenance | Conservation Commission, Information Technology | Continue to provide manual and updates with best current methods | 3.4.3 | * | * | * | * | * |
| | | 2. Provide relevant stormwater information to different audiences via various social media platforms | Information Technology | Follow statewide “Think Blue” campaign on social media platforms | | * | * | * | * | * |
| | | 3. Provide comprehensive stormwater information on the Town's website, including 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). | Information Technology, Conservation Commission | Continue to update and maintain the websites | | * | * | * | * | * |

Table 11-1. Proposed BMP Plan - Implementation of Phase II Activities

| BMP ID | BMP Description | Implementation | Responsible Dept./Person | Measurable Goal | Report Section | Year / Schedule | | | | |
|--|---|---|---|--|----------------|-----------------|---------------|---------------|---------------|---------|
| | | | | | | 1 | 2 | 3 | 4 | 5+ |
| | | | | | | 7/1/18-7/1/19 | 7/1/19-7/1/20 | 7/1/20-7/1/21 | 7/1/21-7/1/22 | 7/1/22- |
| 2. Public Participation and Involvement | | | | | | | | | | |
| 2-1 | Make SWMP Publicly Available | 1. Post SWMP Plan on Town website, along with contact name, email address and/or phone number of a contact person at the Town to contact for information or submit comments. | Conservation Commission, Information Technology, Town Administrator / Board of Selectmen, Planning Department | Annual review of stormwater management plan and posting on website. Allow public to comment on the plan at least annually | 4.4.1 | * | * | * | * | * |
| 2-2 | Watershed Group Involvement | 1. Participate with local watershed groups, including the Charles River Stormwater Collaborative and the Minuteman Advisory Group on Interlocal Coordination (MAGIC) Stormwater Partnership, to stay up-to-date with regional stormwater management efforts. | Conservation Commission | Continue ongoing involvement to protect the health of local and regional wetlands and watersheds. | 4.4.2 | * | * | * | * | * |
| 2-3 | Habitat Inventory and Monitoring | 1. Engage in long-term ecosystem monitoring with the help of volunteers and through a partnership with Brandeis University and Harvard Forest. | Conservation Commission | Continue baseline monitoring of conservation lands, as well as long-term ecosystem monitoring and studies. | 4.4.3 | * | * | * | * | * |
| 2-4 | Wetland Restoration | 1. Work with various classes and children's groups on local ecological issues, including teaching the importance of stormwater management for a safe drinking water supply through wetland clean-up activities and the removal of invasive species. | Conservation Commission, Schools | Sponsor wetland cleanup and restoration events at least once per year | 4.4.4 | * | * | * | * | * |
| 2-5 | Stormwater Hotline | 1. Provide a stormwater hotline to allow for public comment or concern regarding stormwater discharges and management. 2. Address concerns or questions received from the public regarding stormwater and illicit discharges. Complaints will be tracked in a database, along with any relevant follow-up actions for annual reporting purposes. | Conservation Commission, Department of Public Works | Respond to questions or complaints received from the public and track on a database any complaints received, as well as follow-up actions. | 4.4.5 | * | * | * | * | * |

Table 11-1. Proposed BMP Plan - Implementation of Phase II Activities

| BMP ID | BMP Description | Implementation | Responsible Dept./Person | Measurable Goal | Report Section | Year / Schedule | | | | |
|---|---|--|--|--|----------------|--------------------|--------------------|--------------------|--------------------|---------------|
| | | | | | | 1 7/1/18-7/1/19 | 2 7/1/19-7/1/20 | 3 7/1/20-7/1/21 | 4 7/1/21-7/1/22 | 5+ 7/1/22- |
| 3. Illicit Discharge Detection and Elimination | | | | | | | | | | |
| 3-1 | Enact and Enforce IDDE Bylaw | 1. Establish a legal authority in order to create an IDDE program to satisfy the 2016 MS4 Permit | Department of Public Works, Board of Health, Planning Department | Regulatory mechanism in place within 1 year of the permit effective date. | 5.4.1 | * | * | * | * | * |
| 3-2 | Phase I Storm Sewer System Map | 1. Delineate catchment areas based on topography for each MS4 outfall and map in GIS. | Department of Public Works | Updated map within 2 years of effective date of permit | 5.4.2 | * | | | | |
| | | 2. Update outfalls, conveyances receiving waters, interconnections, MS4-owned BMPs & initial catchment delineations. | | | | * | * | | | |
| 3-3 | Phase II Storm Sewer System Map | 1. Update outfall spatial location, pipes, manholes, catch basins, refined catchment delineations as new information becomes available. | Department of Public Works | Updated map within 10 years of effective date of permit | 5.4.2 | * | * | * | * | * |
| 3-4 | Written IDDE Program | 1. Prepare written IDDE Plan to include procedures on assessing and priority ranking outfalls and interconnections, dry and wet weather outfall sampling, catchment investigations, system vulnerability factor assessment, identification of an illicit discharge, illicit discharge removal, and ongoing screening requirements. | Department of Public Works, Board of Health | Complete within 1 year of the effective date of permit and update as required | 5.4.3 | * | | | | |
| 3-5 | Outfall / Interconnection Inventory and Ranking | 1. Develop an outfall and interconnection inventory that identifies each outfall and interconnection discharging from the MS4, records its location and condition and provides a framework for tracking inspections, screenings and other activities under the IDDE program. | Department of Public Works | Identification of outfalls and initial ranking by July 1, 2019 | 5.4.3 | * | | | | |
| | | 2. Classify/rank outfalls. Initial ranking by end of Year 1. Update ranking annually with new information. | | | | * | * | * | * | * |
| 3-6 | Implement IDDE Program | 1. Inspect key catchment structures (manholes, catch basins) during dry weather conditions. Where flowing water is observed, collect samples for analysis. | Department of Public Works, Board of Health | Implement catchment investigations according to program and permit conditions (Problem Outfalls by July 1, 2025, all outfalls by July 1, 2028) | 5.4.3 | | * | * | * | * |
| | | 2. Inspect key catchment structures (manholes, catch basins) in all catchments during dry weather conditions. Where flowing water is observed, collect samples for analysis. | | | | | * | * | * | * |
| 3-7 | Dry Weather Screening | 1. Inspect drainage outfalls classified as High or Low priority during dry weather. | Department of Public Works, Board of Health | Complete in accordance with outfall screening procedure and permit conditions by July 1, 2021 | 5.4.4 | * | * | * | | |
| | | 2. Investigate potential illicit discharges, if any. | | | | * | * | * | * | * |
| | | 3. Enforce removal of illicit discharges, if any. | | | | * | * | * | * | * |
| 3-8 | Wet Weather Screening | 1. Sample select outfalls with System Vulnerability Factors under wet weather conditions. Sampling can be done upon completion of any dry weather investigation, but must be completed before catchment investigation is marked as complete. | Department of Public Works, Board of Health | Complete in accordance with outfall screening procedure within 10 years of the effective permit date | 5.4.4 | | | | | * |
| 3-9 | Ongoing Screening | 1. Upon completion of catchment investigations, reprioritize outfalls for ongoing screening. | Department of Public Works, Board of Health | Conduct ongoing dry and wet weather outfall screening upon completion of the IDDE program | 5.4.4 | | | | | * |
| | | 2. Continue performing dry and wet weather sampling according to the new prioritization at least once every 5 years. | | | | | | | | * |
| 3-10 | Perform IDDE Training | 1. Provide annual training to employees involved in the IDDE program. | Department of Public Works | Train applicable employees annually | 5.4.5 | * | * | * | * | * |

Table 11-1. Proposed BMP Plan - Implementation of Phase II Activities

| BMP ID | BMP Description | Implementation | Responsible Dept./Person | Measurable Goal | Report Section | Year / Schedule | | | | |
|---|--|---|---|---|----------------|-----------------|---------------|---------------|---------------|---------|
| | | | | | | 1 | 2 | 3 | 4 | 5+ |
| | | | | | | 7/1/18-7/1/19 | 7/1/19-7/1/20 | 7/1/20-7/1/21 | 7/1/21-7/1/22 | 7/1/22- |
| 4. Construction Site Stormwater Runoff Control | | | | | | | | | | |
| 4-1 | Develop and Enforce Construction Bylaw | 1. Develop and enforce construction bylaw to address control of other wastes at construction sites. | Conservation Commission, Planning and Land Use, Building Department | Complete bylaw updates within 1 year of the effective date of the permit | 6.4.1 | * | | | | |
| 4-2 | Develop Written Procedures for Site Plan Review | 1. Review and update existing requirements mandating site plan review and make changes as needed, such as incorporating additional information submitted by the public. | Conservation Commission, Planning and Land Use, Building Department | Establish procedures for site plan review within 1 year of the effective date of the permit | 6.4.2 | * | | | | |
| 4-3 | Develop Written Procedures for Site Inspections and Enforcement | 1. Review and update existing requirements mandating site inspections, enforcement, and requirements for submittal of monthly inspection reports as needed | Conservation Commission, Planning and Land Use, Building Department | Establish procedures for site inspections and enforcement within 1 year of the effective date of the permit | 6.4.3 | * | | | | |
| 4-4 | Establish a Sediment and Erosion Control Program | 1. Establish procedures for development of an Erosion and Sediment Control Plan for construction site operators performing land disturbance activities. | Conservation Commission, Planning and Land Use, Building Department | Establish procedures for development of an erosion and sediment control program within 1 year of the effective date of the permit | 6.4.4 | * | | | | |
| 4-5 | Develop Procedures for Waste Control | 1. Establish requirements to control construction site wastes within 1 year of the effective date of the permit | Conservation Commission, Planning and Land Use, Building Department | Establish requirements to control construction site wastes within 1 year of the effective date of the permit | 6.4.4 | * | | | | |

Table 11-1. Proposed BMP Plan - Implementation of Phase II Activities

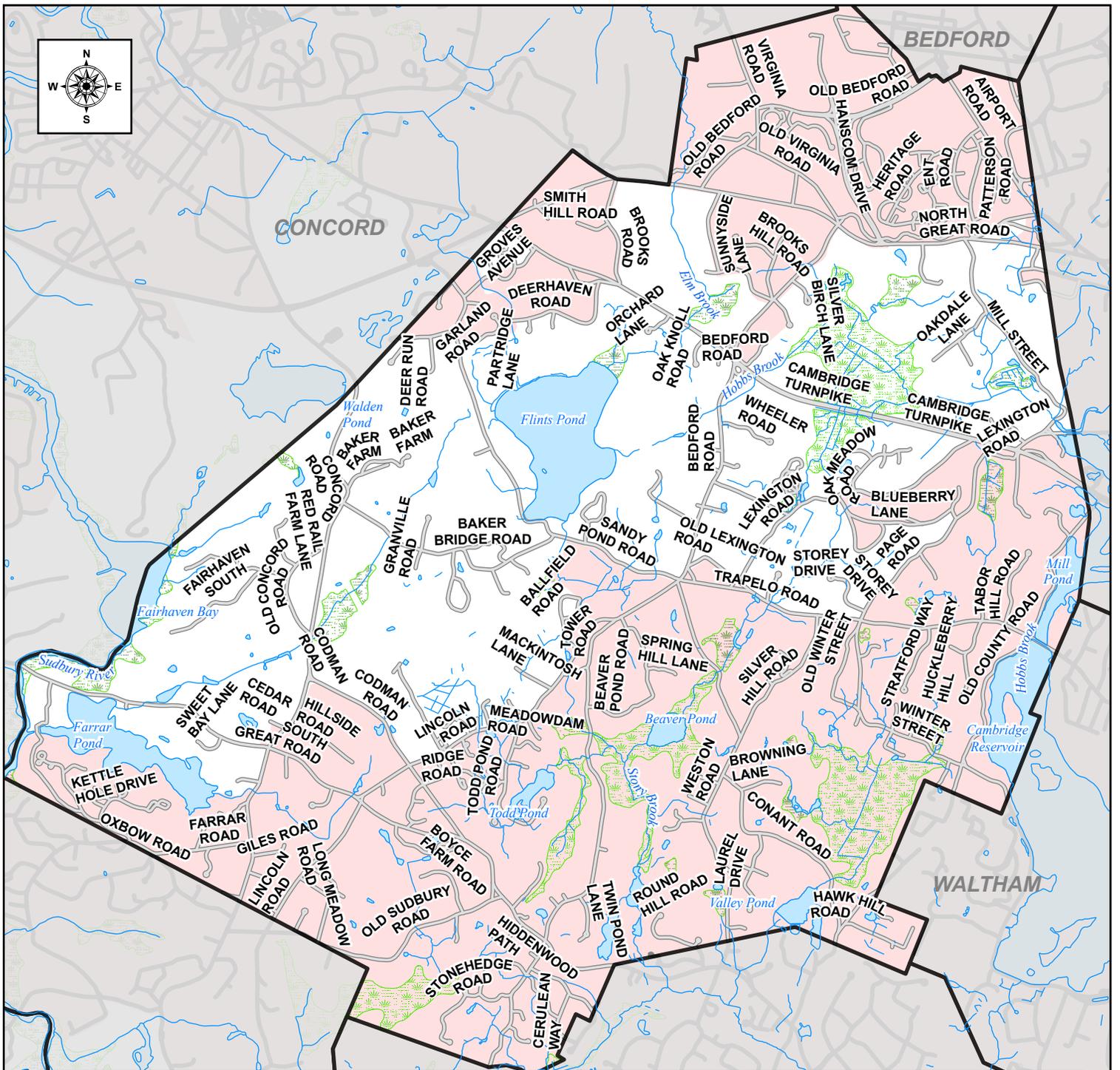
| BMP ID | BMP Description | Implementation | Responsible Dept./Person | Measurable Goal | Report Section | Year / Schedule | | | | |
|--|--|--|---|---|----------------|-----------------|---------------|---------------|---------------|---------|
| | | | | | | 1 | 2 | 3 | 4 | 5+ |
| | | | | | | 7/1/18-7/1/19 | 7/1/19-7/1/20 | 7/1/20-7/1/21 | 7/1/21-7/1/22 | 7/1/22- |
| 5. Stormwater Management in New Development and Redevelopment | | | | | | | | | | |
| 5-1 | Develop and Enforce Post-Construction Bylaw | 1. Adopt a post-construction stormwater management bylaw that addresses 2016 MS4 Permit requirements. Include a requirement that stormwater management BMPs that ultimately discharge to a phosphorus impaired water body be optimized for phosphorus removal. | Conservation Commission, Planning and Land Use, Building Department | Complete bylaw updates within 2 years of the effective date of the permit | 7.1.1 | * | * | | | |
| 5-2 | Require Stormwater As-Built Plan Submittal | 1. Require submittal of as-built drawings for structural and non-structural stormwater controls. | Conservation Commission, Planning and Land Use, Building Department | Require submittal of as-built plans for completed projects within 2 years of completion | 7.1.2 | * | * | | | |
| 5-3 | Require Long Term Operation and Maintenance | 1. Establish procedures to require long term operation and maintenance of BMPs, such as addressing funding sources. | Conservation Commission, Planning and Land Use, Building Department | Require submittal of operation and maintenance plans to ensure long term maintenance within 2 years of the effective date of the permit | 7.1.3 | * | * | | | |
| 5-4 | Street Design and Parking Lot Guidelines | 1. Review existing by-laws, regulations and guidance pertaining to current street and parking lot design and all regulations for ability to incorporate LID into designs. | Conservation Commission, Planning and Land Use, Building Department | Complete regulatory updates within 4 years of the effective date of the permit | 7.1.4 | | * | * | | |
| | | 2. Prepare a report assessing whether existing street and parking lot design regulations allow for incorporation of LID practices and recommendations for changes. | | | | | | * | | |
| 5-5 | Allow Green Infrastructure | 1. Review existing by-laws, regulations and guidance to determine the feasibility of making green practices allowable. | Conservation Commission, Planning and Land Use, Building Department | Complete regulatory updates within 4 years of the effective date of the permit | 7.1.4 | | * | * | | |
| | | 2. Prepare a report assessing existing local regulations to determine the feasibility of allowing green roofs, infiltration practices, and water harvesting devices. | | | | | | * | | |
| 5-6 | Target Properties to Reduce Impervious Area | 1. Identify 5 properties for potential retrofits to stormwater impacts, as well as phosphorus impacts to the Charles River Watershed. | Conservation Commission, Planning and Land Use, Building Department | Complete inventory within 4 years of the effective date of the permit and update annually on retrofitted properties | 7.1.5 | | | | * | |
| | | 2. Track and report annually properties that have been modified or retrofitted with BMPs. | | | | | | * | * | |

Table 11-1. Proposed BMP Plan - Implementation of Phase II Activities

| BMP ID | BMP Description | Implementation | Responsible Dept./Person | Measurable Goal | Report Section | Year / Schedule | | | | |
|--|---|---|--|--|----------------|-----------------|---------------|---------------|---------------|---------|
| | | | | | | 1 | 2 | 3 | 4 | 5+ |
| | | | | | | 7/1/18-7/1/19 | 7/1/19-7/1/20 | 7/1/20-7/1/21 | 7/1/21-7/1/22 | 7/1/22- |
| 6. Good Housekeeping and Pollution Prevention | | | | | | | | | | |
| 6-1 | Inventory Open Spaces, Buildings and Facilities, and Vehicles and Equipment | 1. Inventory all permittee-owned parks and open spaces, building and facilities (including storm drains), and vehicles and equipment in the regulated area. | Department of Public Works, Parks and Recreation Department, Building Department | Complete inventory of open spaces, buildings and facilities, and vehicles and equipment within 2 years of the effective date of the permit | 8.3.1 | | * | | | |
| 6-2 | Establish Operation and Maintenance Procedures | 1. Evaluate practices at MS4 properties (parks and open spaces, building and facilities, vehicles and equipment) and develop written Facilities O&M Plan. | Department of Public Works, Parks and Recreation Department, Building Department | Create written O&M Plan for open spaces, buildings and facilities, and vehicles and equipment within 2 years of the effective date of the permit | 8.3.1 | | * | | | |
| | | 2. Distribute written O&M/SOPs as part of employee training. | | | | | * | | | |
| | | 3. Update inventory annually | | | | | * | * | * | * |
| | | 4. Ensure all vehicle maintenance and washing is performed indoors. | | | | * | * | * | * | * |
| 6-3 | Review Infrastructure O&M Procedures | 1. Develop written O&M procedures or SOPs for the storm drain system, roadways and existing Town-owned BMPs (e.g., catch basin cleaning, street sweeping, winter road maintenance, stormwater BMPs). | Department of Public Works | Written SOPs. | 8.3.2 | | * | | | |
| | | 2. Distribute written O&M/SOPs as part of employee training. | | | | | * | | | |
| 6-4 | Catch Basin Cleaning | 1. Establish a cleaning schedule and maintain catch basins so that they remain less than 50% full of sediment. | Department of Public Works | Clean catch basins on established schedule and report number of catch basins cleaned and volume of material moved annually. | 8.3.2 | As Needed | | | | |
| | | 2. Properly manage storage of catch basin residuals. | | | | * | * | * | * | * |
| 6-5 | Street Sweeping | 1. Sweep streets once a year in spring and twice a year where drainage is to a phosphorus impaired water. | Department of Public Works | Sweep all streets and parking lots at least annually and sweep all streets within the Charles River watershed twice per year. | 8.3.2 | * | * | * | * | * |
| | | 2. Properly manage storage of street sweeping residuals. | | | | | | | | |
| 6-6 | Road Salt Optimization Program | 1. Establish and implement procedures for proper winter road maintenance, including use and storage of salt and sand, and procedures to minimize the use of road salt. | Department of Public Works | Implement salt use optimization during winter maintenance operations | 8.3.2 | * | | | | |
| 6-7 | Assess Regulated Facilities to Determine SWPPP Eligibility | 1. Evaluate the need for SWPPPs for municipal maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater. Complete SWPPP or document No Exposure as applicable. | Department of Public Works | Document whether a SWPPP is needed and where required, prepare SWPPP by July 1, 2020. | 8.3.3 | | * | | | |
| 6-8 | Develop SWPPPs for Applicable Facilities | 1. Evaluate the need for SWPPPs for municipal maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater. Complete SWPPP or document No Exposure as applicable. | Department of Public Works | Document whether a SWPPP is needed and where required, prepare SWPPP by July 1, 2020. | 8.3.3 | | * | | | |
| 6-9 | Spill Prevention and Response Training | 1. Perform training on IDDE program, spill response, good housekeeping, etc. | Department of Public Works, Fire Department | Train staff on good housekeeping procedures annually | 8.3.3 | * | * | * | * | * |
| 6-10 | Establish BMP O&M Procedures | 1. Establish written inspection and maintenance procedures and frequencies for inspection of all structural stormwater BMPs. | Department of Public Works | Create written O&M Plan for stormwater BMPs within 2 years of the effective date of the permit | 8.3.4 | | * | | | |
| 6-11 | Inspect MS4-owned BMPs | 1. Annually inspect MS4-owned stormwater treatment BMPs. Document inspections and maintenance performed. | Department of Public Works | Inspect and maintain treatment structures annually | 8.3.4 | | * | * | * | * |

Table 11-1. Proposed BMP Plan - Implementation of Phase II Activities

| BMP ID | BMP Description | Implementation | Responsible Dept./Person | Measurable Goal | Report Section | Year / Schedule | | | | |
|---|--|---|---|--|----------------|-----------------|---------------|---------------|---------------|---------|
| | | | | | | 1 | 2 | 3 | 4 | 5+ |
| | | | | | | 7/1/18-7/1/19 | 7/1/19-7/1/20 | 7/1/20-7/1/21 | 7/1/21-7/1/22 | 7/1/22- |
| 7. TMDL and Impaired Waters Controls | | | | | | | | | | |
| 7-1 | Discharges to Approved TMDL Waterbodies - Phosphorus (Charles River) | 1. Enhanced BMPs - Public Education. Include fertilizer use, disposal of grass clippings and leaf litter, and pet waste management with the Residential and Commercial public education programs. | Department of Public Works, Conservation Commission | Distribute materials with Residential and Commercial education programs. | | * | * | * | * | * |
| | | 2. Enhanced BMPs - Stormwater Management in New Development and Redevelopment. Include a requirement in the regulatory mechanism that new development and redevelopment stormwater management BMPs be optimized for phosphorus removal. | | Complete bylaw updates within 2 years of the effective date of the permit | | * | * | | | |
| | | 3. Enhanced BMPs - Consider BMPs to reduce phosphorus discharges when identifying MS4 properties for retrofits. | | Evaluate stormwater BMPs for phosphorus removal during facility inventory within 2 years of the effective date of the permit | | * | * | | | |
| | | 4. Enhanced BMPs - Good Housekeeping and Pollution Prevention. Incorporate phosphorus reduction practices into Town good housekeeping practices such as fertilizer use and managing grass cuttings and leaf litter. | | Create written O&M Plan for open spaces, buildings and facilities, and vehicles and equipment within 2 years of the effective date of the permit | | | * | | | |
| | | 5. Enhanced BMPs - Good Housekeeping and Pollution Prevention. Increase street sweeping to twice per year (spring and fall) for catchment areas that discharge to MS4 areas within the Charles River watershed. | | Sweep all streets and parking lots within the Charles River watershed twice per year. | | * | * | * | * | * |
| | | 6. Prepare a Phosphorus Control Plan to reduce the amount of phosphorus in stormwater discharges from MS4 to the Charles River and its tributaries. | | Complete Phosphorus Control Plan no later than 20 years of the effective date of the permit. | | | | | | |
| | | 7. Design and install a structural and non-structural BMPs to remove phosphorus from stormwater runoff. | | Installed demonstration BMP within 6 years of the effective date of the permit. | | | | | | * |
| | | 8. Track BMPs installed, including type, location, total area treated, design storage volume and estimated phosphorus removal and report annually to EPA and MassDEP. | | Summary progress table. | | | | | | * |
| 7-2 | Discharges to Approved TMDL Waterbodies - Bacteria (Shawsheen River, Elm Brook) | 1. Enhanced BMPs - Public Education. Include management of pet waste and septic system maintenance with the Residential public education program. | Department of Public Works, Conservation Commission | Distribute materials with Residential education program. | 9.2.1 | * | * | * | * | * |
| | | 2. Enhanced BMPs - Illicit Discharge, Detection, and Elimination. Designate catchment draining to bacteria/pathogen impaired segments as "Problem Catchments" or "High" priority catchments in IDDE ranking. | | Complete initial ranking within 1 year of the effective date of the permit | | * | | | | |
| 7-3 | Discharges to Water Quality Limited Waterbodies - Turbidity (Elm Brook, Cambridge Reservoir - Upper Basin) | 1. Enhanced BMPs - Stormwater Management in New Development and Redevelopment. Mandate that designs of stormwater systems on commercial and industrial land uses allow for spill containment. | Department of Public Works, Conservation Commission | Adopt new design guidelines for commercial and industrial construction. | 9.5.1 | | * | * | * | |
| | | 2. Enhanced BMPs - Good Housekeeping and Pollution Prevention. Increase street sweeping for areas with higher pollutant loads. | | Increase street sweeping if needed. | | | * | * | * | * |
| | | 3. Enhanced BMPs - Good Housekeeping and Pollution Prevention. Increase catch basin cleaning if inspections indicate that more frequent cleaning is necessary. | | Increase catch basin cleaning if needed. | | | * | * | * | * |



Legend

-  Urbanized Area
-  Stream, Brook
-  Lake, Pond, Reservoir
-  Wetland
-  Town Boundaries

**Figure 1-1.
Urbanized Area**

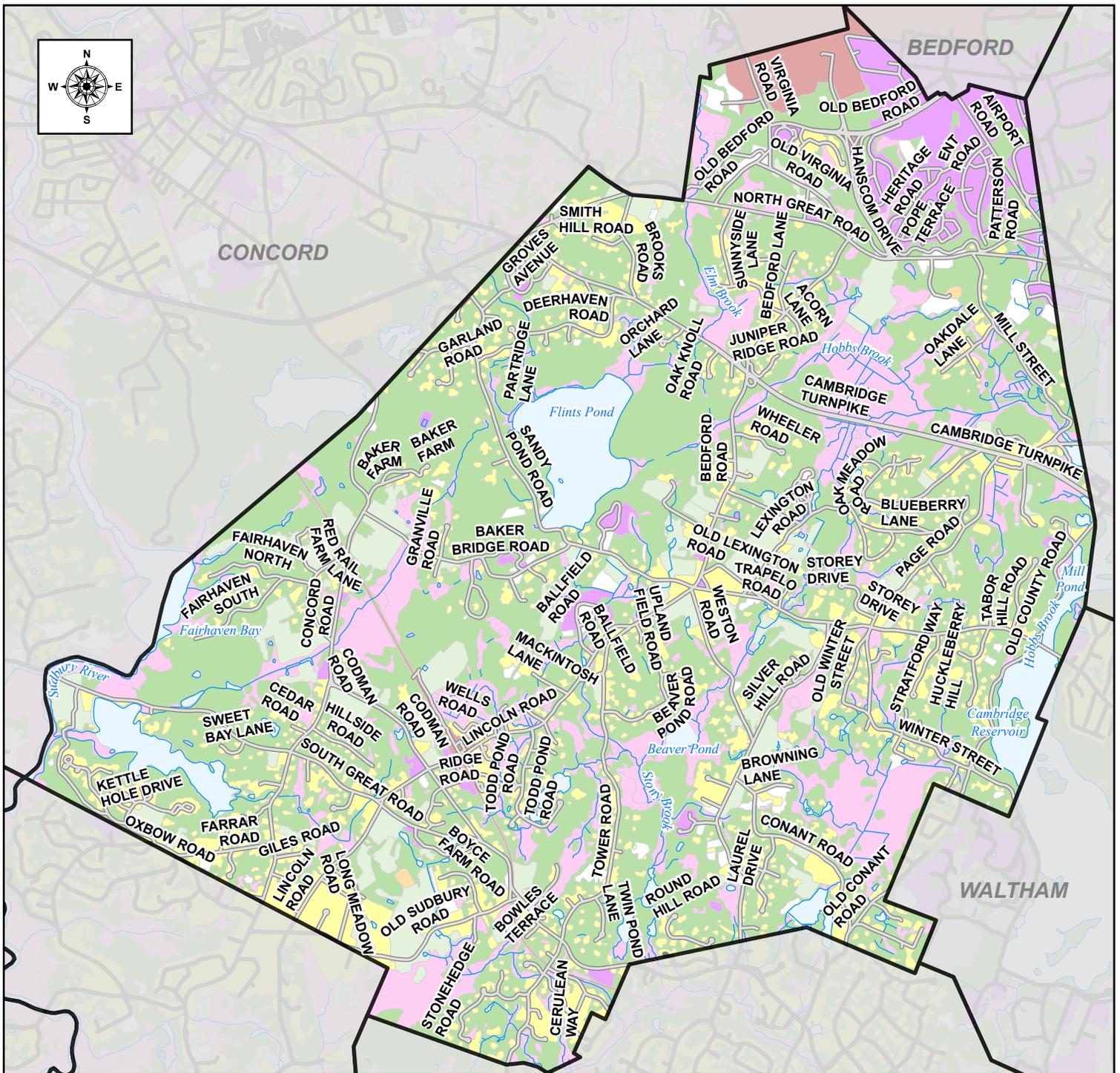
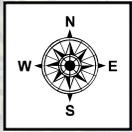
Lincoln, MA



**Comprehensive
Environmental
Incorporated**



Data Source: MassGIS



Legend

- | | | | |
|--|----------------|--|--------------------|
| | Industrial | | Water |
| | Transportation | | Wetland |
| | Residential | | Disturbed Land |
| | Commercial | | Other Cleared Land |
| | Agriculture | | Stream, Brook |
| | Forest | | |

**Figure 2-1.
Land Use**

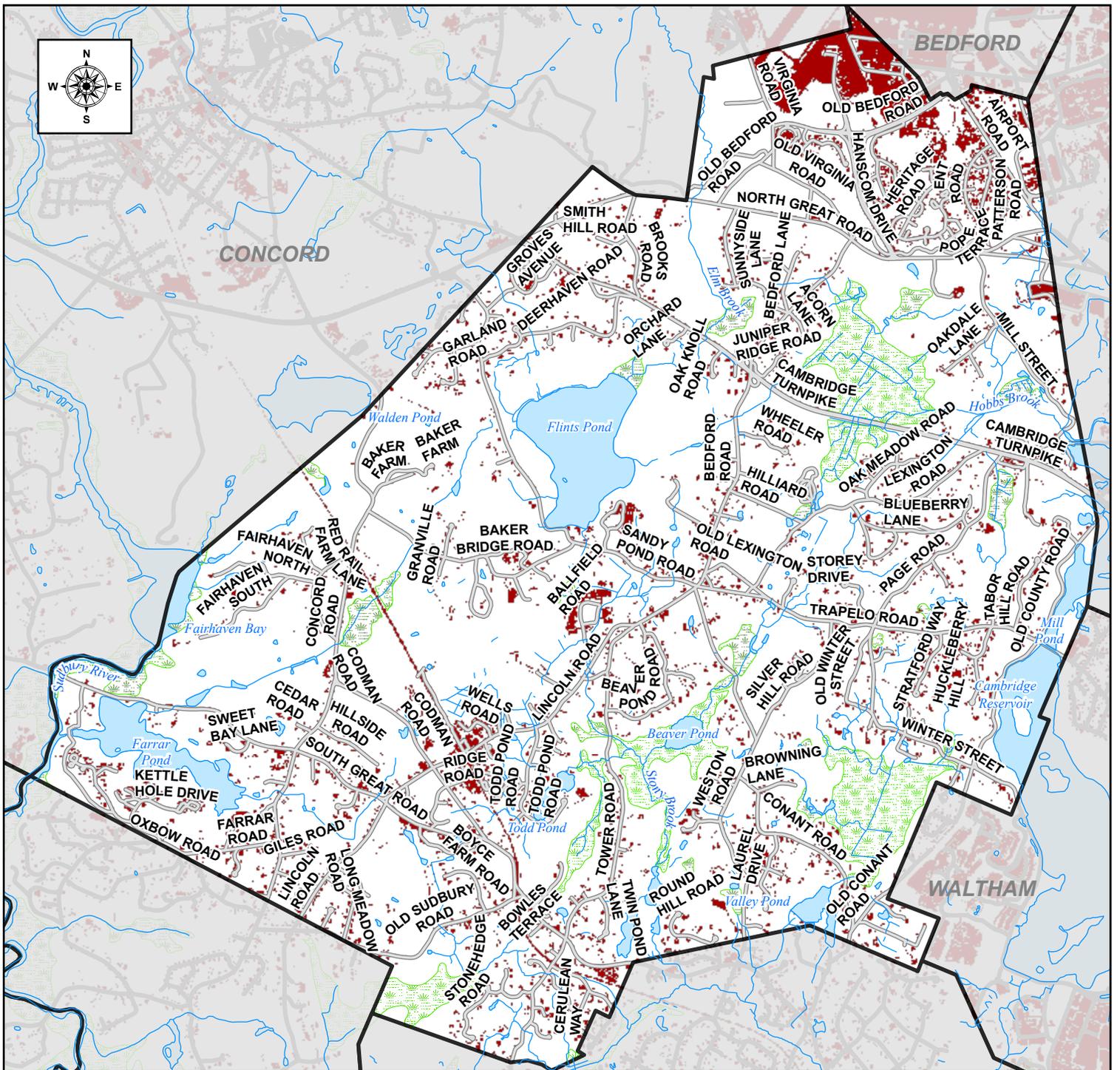
Lincoln, MA



**Comprehensive
Environmental
Incorporated**



Data Source: MassGIS



Legend

- Impervious Surface
- Town Boundaries
- Lake, Pond, Reservoir
- Wetland
- Stream, Brook

**Figure 2-2.
Impervious Area**

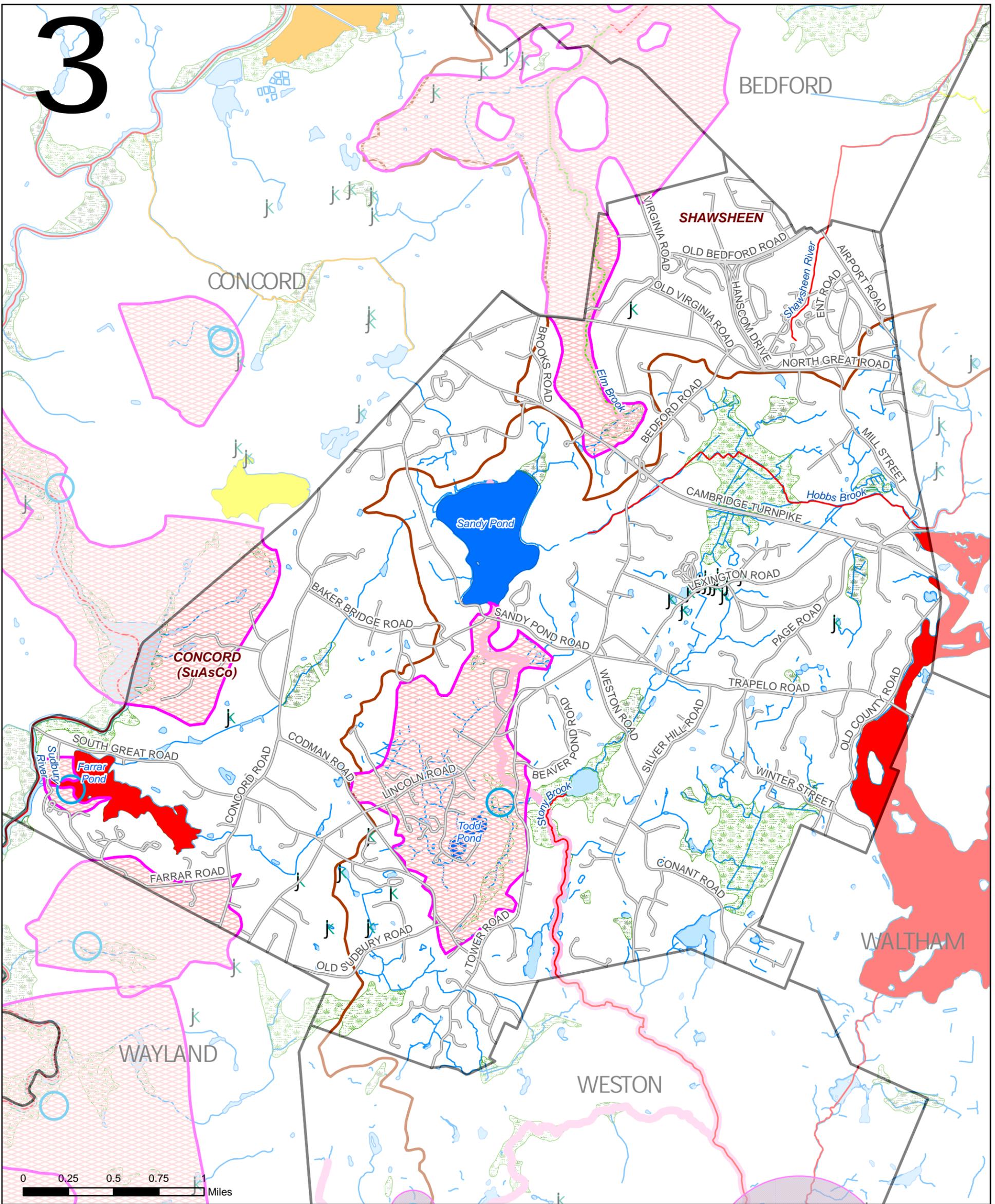
Lincoln, MA



**Comprehensive
Environmental
Incorporated**



Data Source: MassGIS



Legend

MassDEP 303(d) Waters:

- 2 - Attaining some uses; other uses not assessed
- 3 - No uses assessed
- 4A - Impaired - TMDL is completed
- 4C - Impairment not caused by a pollutant
- 5 - Impaired - TMDL required
- River Basin
- MassDFW Coldwater Fisheries

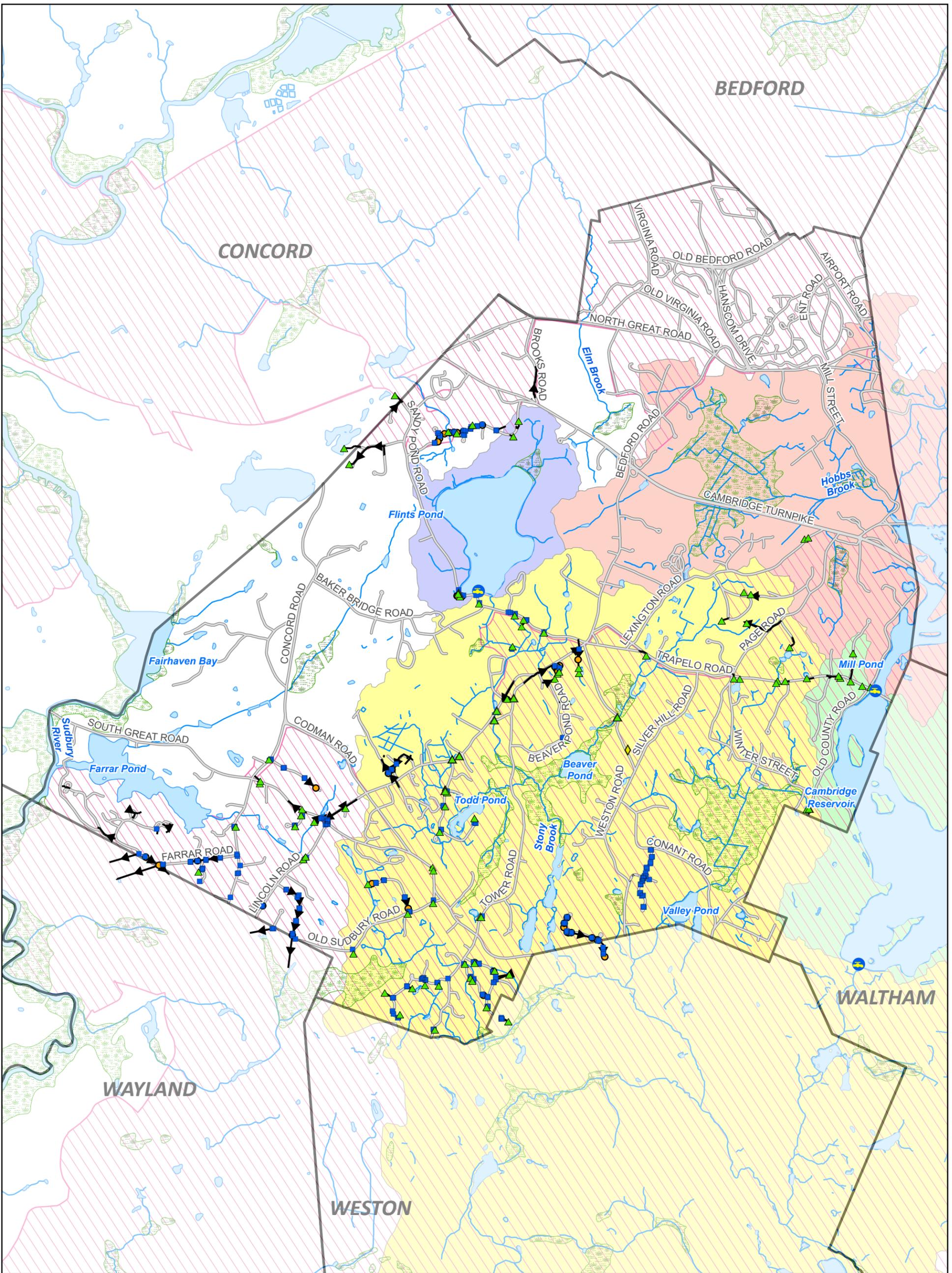
- DEP Approved Zone I
- DEP Approved Zone II
- IWPA
- Certified Vernal Pool
- Lake, Pond, Reservoir
- Wetland, Marsh, Swamp
- Stream, Brook

Resource Waters

Lincoln, MA



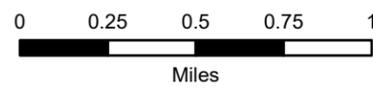
Comprehensive
Environmental
Incorporated



Legend

- | | |
|--|-----------------------|
| Surface Water Intake | Stone Channel Outfall |
| Emergency Surface Water | Catch Basin |
| Surface Water Supply Watersheds | Channel |
| Flints Pond | Drainage Manhole |
| Lower Hobbs Brook | Interconnection |
| Upper Hobbs Brook | Drainage Pipe |
| Stony Brook | Lake, Pond, Reservoir |
| Outfall 2021 | Wetland, Marsh, Swamp |
| Breakout Point, Riprap Area, Eroded Channel- Outfall | Stream, Brook |
| Paved Channel Outfall | Urbanized Area |
| Pipe Outfall | |

Figure 2-4
Stormwater Infrastructure in
Surface Water Supply Watersheds
Lincoln, MA



Data Sources: MassGIS, Town of Lincoln, CEI

Appendix A

Notice of Intent and Authorization to Discharge

Part I: General Conditions

General Information

Name of Municipality or Organization: Town of Lincoln State: MA

EPA NPDES Permit Number (if applicable): MAR041043

Primary MS4 Program Manager Contact Information

Name: Timothy Higgins Title: Town Administrator

Street Address Line 1: 16 Lincoln Road

Street Address Line 2: First Floor

City: Lincoln State: MA Zip Code: 01773

Email: higginst@lincolntown.org Phone Number: (781) 259-2600

Fax Number: (781) 259-8735

Other Information

Stormwater Management Program (SWMP) Location (web address or physical location, if already completed):

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? 80% If 100% of 2003 requirements not met, enter an estimated date of completion (MM/DD/YY): 06/30/19

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? No Effective Date or Estimated Date of Adoption (MM/DD/YY): 06/30/19

Construction/Erosion and Sediment Control (ESC) Authority Adopted? No Effective Date or Estimated Date of Adoption (MM/DD/YY): 06/30/19

Post- Construction Stormwater Management Adopted? No Effective Date or Estimated Date of Adoption (MM/DD/YY): 06/30/19

Notice of Intent (NOI) for coverage under Small MS4 General Permit

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.

Massachusetts list of impaired waters: [Massachusetts 2014 List of Impaired Waters- http://www.mass.gov/eea/docs/dep/water/resources/07v5/14list2.pdf](http://www.mass.gov/eea/docs/dep/water/resources/07v5/14list2.pdf)

Check off relevant pollutants for discharges to impaired waterbodies (see above 303(d) lists) without an approved TMDL in accordance with part 2.2.2.a of the permit. List any other pollutants in the last column, if applicable.

| Waterbody segment that receives flow from the MS4 | Number of outfalls into receiving water segment | Pollutants | | | | | | | | | | Other pollutant(s) causing impairments |
|--|---|--------------------------|--------------------------|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--|
| | | Chloride | Chlorophyll-a | Dissolved Oxygen/DO Saturation | Nitrogen | Oil & Grease/ PAH | Phosphorus | Solids/ TSS/ Turbidity | E. coli | Enterococcus | | |
| MA72014, Cambridge Reservoir | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| MA72117, Todd Pond | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Iron Mine Brook | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Stony Brook main stem to Sandy Pond | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Stony Brook west branch | 4 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Unnamed tributary to Farrar Pond | 3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Mill Brook | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Denormandie Land wetland at Trapelo Rd/Winter St | 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Unnamed wetland at end of Page Farm Rd | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Unnamed pond between #134 and #144 Trapelo Rd | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Unnamed pond S of Sandy Pond Rd, just inside Concord | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Stony Brook just over town line into Weston | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Unnamed pond between Old County and Forester Rds | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Pierce Pond | 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Unnamed pond in Pierce Park near Beaver Pond Rd | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Unnamed pond S of Stonehedge Rd | 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| Unnamed wetland S of Old Sudbury Rd | 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

Click to lengthen table

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 <small>(enter your own text to override the drop down menu)</small> | BMP Description | Targeted Audience | Responsible Department/Parties <small>(enter your own text to override the drop down menu)</small> | Measurable Goal | Beginning Year of BMP Implementation |
|---|--|--------------------------------------|---|---|--------------------------------------|
| Brochures/Pamphlets | Distribute flyers regarding stormwater awareness and healthy lawns and landscapes, detailing pet waste disposal, lawn care, and the minimization or elimination of pesticide and fertilizer use. | Residents | Conservation Commission | Continue to provide information at Town Hall and public town events. Distribute brochures to residents. | 2018 |
| Brochures/Pamphlets | Distribute stormwater flyers to new residents as part of a welcome packet to engage them with stormwater issues. | Residents | Conservation Commission, Town Clerk | Continue to provide information to all new homeowners. | 2018 |
| Brochures/Pamphlets | Provide homeowner and contractor BMP manual for ecological design, construction, and maintenance. | Residents, Developers (construction) | Conservation Commission, Information Technology | Continue to provide manual and updates with best current methods. | 2018 |
| Brochures/Pamphlets | Distribute pet waste fact sheets with dog registrations and renewals. | Residents | Town Clerk | Provide information with all applications and renewals. | 2018 |

| | | | | | |
|--|--|--|--|---|-------------|
| <p>Newspaper Articles/Press Releases</p> | <p>Provide education regarding stormwater definitions, control, impacts, and influences through articles in the local newspaper.</p> | <p>Residents</p> | <p>Conservation Commission</p> | <p>Write at least one article per year.</p> | <p>2018</p> |
| <p>Web Page</p> | <p>Provide information on website related to illicit storm drain dumping, private septic system and well maintenance, proper hazardous waste disposal, and use of detergents, fertilizers, etc., and use of environmentally friendly products.</p> | <p>Residents</p> | <p>Conservation Commission, Information Technology</p> | <p>Continue to update and maintain the websites.</p> | <p>2018</p> |
| <p>Web Page</p> | <p>Provide information on website related to illicit storm drain dumping, proper hazardous waste disposal, and use of detergents, fertilizers, etc., and use of environmentally friendly products.</p> | <p>Businesses, Institutions, and Commercial Facilities</p> | <p>Conservation Commission, Information Technology</p> | <p>Continue to update and maintain the websites.</p> | <p>2018</p> |
| <p>Web Page</p> | <p>Provide information on website related to erosion and sediment control, Low Impact Development, and the Construction General Permit.</p> | <p>Developers (construction)</p> | <p>Conservation Commission, Information Technology</p> | <p>Continue to update and maintain the websites.</p> | <p>2018</p> |
| <p>Web Page</p> | <p>Municipal GIS website offers free access to GIS data layers for the Town.</p> | <p>Residents, Businesses, Institutions, Commer</p> | <p>Information Technology</p> | <p>Continue to update data layers to allow public access to accurate, up-to-date content.</p> | <p>2018</p> |

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 <small>(enter your own text to override the drop down menu)</small> | Responsible Department/Parties <small>(enter your own text to override the drop down menu)</small> | Additional Description/ Measurable Goal | Beginning Year of BMP Implementation |
|----------------------|--|---|--|--------------------------------------|
| Public Review | SWMP Review | Conservation Commission, Information Technology, Board of Selectmen, Planning | Allow annual review of stormwater management plan and posting of stormwater management plan on website. | 2018 |
| Public Participation | Develop and upload SWMP to the Town website and provide a link to | Conservation Commission, Information Technology, Board of Selectmen, Planning | Allow public to comment on stormwater management plan annually. | 2018 |
| Public Review | Annual meeting on NPDES plan and report | Town Administrator | Hold annual NPDES meeting including town planner, conservation director, and public works director | 2018 |
| Public Participation | Watershed group involvement | Conservation Commission | Continue ongoing activities to protect the health of wetlands and watersheds through involvement with groups like the Charles River Stormwater Collaborative, MAGIC Stormwater Partnership, SuAsCo River Stewardship Council | 2018 |
| Public Participation | Habitat inventory and monitoring | Conservation Commission | Continue baseline monitoring of conservation lands and holdings, as well as long-term ecosystem monitoring and studies | 2018 |
| Public Participation | Wetland restoration | Conservation Commission, Schools | Work at least once per year with school groups to restore wetland habitat through the removal of invasive species. | 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 Implementation |
|---|---|---|--|---|
| SSO inventory | Develop SSO inventory in accordance of permit conditions | Department of Public Works, Health Department | Complete within 1 year of effective date of permit | 2018 |
| Storm sewer system map | Create map and update during IDDE program completion | Department of Public Works | 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 | Department of Public Works, Health Department | 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 | Department of Public Works, Health Department | Complete 10 years after effective date of permit | 2020 |
| Employee training | Train employees on IDDE implementation | Department of Public Works | Train annually | 2018 |
| Conduct dry weather screening | Conduct in accordance with outfall screening procedure and permit conditions | Department of Public Works, Health Department | Complete 3 years after effective date of permit | 2019 |
| Conduct wet weather screening | Conduct in accordance with outfall screening procedure | Department of Public Works, Health Department | Complete 10 years after effective date of permit | 2024 |
| Ongoing screening | Conduct dry weather and wet weather screening (as necessary) | Department of Public Works, Health Department | Complete ongoing outfall screening upon completion of IDDE program | 2028 |
| IDDE Ordinance/Bylaw | Create and implement a new IDDE bylaw | Department of Public Works, Health Department, Planning Departme | Conduct discussions and review of regulations regarding IDDE. | 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 <small>(enter your own text to override the drop down menu or entered text)</small> | BMP Description | Responsible Department/Parties <small>(enter your own text to override the drop down menu)</small> | Measurable Goal <small>(all text can be overwritten)</small> | 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 | Conservation Commission, Planning and Land Use, Building Department | Complete within 1 year of the effective date of permit | 2018 |
| Site plan review | Complete written procedures of site plan review and begin implementation | Conservation Commission, Planning and Land Use, Building Department | 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 | Conservation Commission, Planning and Land Use, Building Department | 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 | Conservation Commission, Planning and Land Use, Building Department | Complete within 1 year of the effective date of permit | 2018 |
| Construction Ordinance/Bylaw | Develop a regulatory mechanism requiring sediment and erosion controls at construction sites disturbing >1 acre | Conservation Commission, Planning and Land Use, Building Department | Complete within 1 year of the effective date of permit | 2018 |
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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 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 | Conservation Commission, Planning and Land Use, Building Department | 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 | Conservation Commission, Planning and Land Use, Building Department | Complete 4 years after effective date of permit and report annually on retrofitted properties | 2020 |
| 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, Planning and Land Use, Building Department | Complete 4 years after effective date of permit and implement recommendations of report | 2020 |
| 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. | Conservation Commission, Planning and Land Use, Building Department | Complete 4 years after effective date of permit and implement recommendations of report | 2020 |

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 | Department of Public Works, Building Department, Parks and Recrea | Complete and implement 2 years after effective date of permit | 2019 |
| Inventory all permittee-owned parks and open spaces, buildings and facilities, and vehicles and equipment | Create inventory | Department of Public Works, Building Department, Parks and Recrea | Complete 2 years after effective date of permit and implement annually | 2019 |
| Infrastructure O&M | Establish and implement program for repair and rehabilitation of MS4 infrastructure | Department of Public Works | Complete 2 years after effective date of permit | 2019 |
| Stormwater Pollution Prevention Plan (SWPPP) | Create SWPPPs for maintenance garages, transfer stations, and other waste-handling facilities | Department of Public Works | Complete and implement 2 years after effective date of permit | 2019 |
| 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 | Department of Public Works | 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 permittee-owned parking lots in accordance with permit conditions | Department of Public Works | Sweep all streets and permittee-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 | Department of Public Works | Implement salt use optimization during deicing season | 2018 |

| | | | | |
|--|---|---|--|------|
| Inspections and maintenance of stormwater treatment structures | Establish and implement inspection and maintenance procedures and frequencies | Department of Public Works | Inspect and maintain treatment structures at least annually | 2018 |
| Employee Training - General Stormwater Topics | Provide municipal spill prevention and cleanup training to Department of Public Works and Fire Department Employees | Department of Public Works, Fire Department | Regular employee training to prevent/reduce stormwater pollution | 2018 |
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Part IV: Notes and additional information

Use the space below to indicate the part(s) of 2.2.1 and 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.

Although portions of Hanscom Air Force Base are within the Town of Lincoln, they are regulated under their own MS4 permit and thus these areas are not included under the Town of Lincoln's program.

Because the Town's population relies on septic systems for wastewater management, SSO considerations will not apply to the Town's program.

Additionally, as the Town of Lincoln does not currently have an industrial sector, this audience has been omitted from the Public Education and Outreach measure.

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:

Timothy Higgins

Title:

Town Administrator

Signature:



[To be signed according to Appendix, Subparagraph B.11, Standard Conditions]

Date:

09/24/18

Note: When prompted during signing, save the document under a new file name



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:

July 27, 2018

Consultation Code: 05E1NE00-2018-SLI-2538

Event Code: 05E1NE00-2018-E-05953

Project Name: Lincoln MS4 Endangered Species Review

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: 05E1NE00-2018-SLI-2538

Event Code: 05E1NE00-2018-E-05953

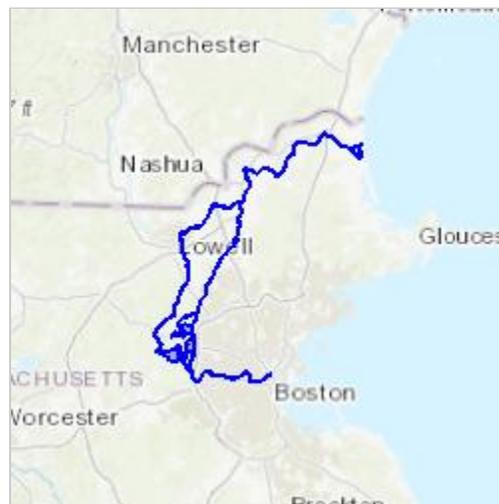
Project Name: Lincoln MS4 Endangered Species Review

Project Type: LAND - DRAINAGE

Project Description: Determination of impact of stormwater discharges and discharge related activities to threatened and endangered species per Appendix C of the MA MS4 General Permit. Stormwater discharge occurs from pre-existing outfalls within the regulated zone, as shown on the map.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/42.45333483644192N71.28274749284269W>



Counties: Essex, MA | Middlesex, MA | Suffolk, MA

Endangered Species Act Species

There is a total of 3 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 Fisheries¹, 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.

-
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 <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045 | Threatened |

Birds

| NAME | STATUS |
|--|------------|
| Red Knot <i>Calidris canutus rufa</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864 | Threatened |
| Roseate Tern <i>Sterna dougallii dougallii</i> 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.



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912**

VIA EMAIL

June 4, 2019

Timothy Higgins
Town Administrator

And;

Timothy Higgins
Town Administrator
16 Lincoln Road
First Floor
Lincoln, MA. 01773
higginst@lincolntown.org

Re: National Pollutant Discharge Elimination System Permit ID #: MAR041043, Town of Lincoln

Dear Timothy Higgins:

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,

A handwritten signature in blue ink that reads "Thelma Murphy". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Thelma Murphy, Chief
Stormwater and Construction Permits Section
Office of Ecosystem Protection
United States Environmental Protection Agency, Region 1

and;

A handwritten signature in black ink that reads "Lealdon Langley". The signature is cursive and somewhat stylized, with a prominent loop at the end.

Lealdon Langley, Director
Wetlands and Wastewater Program
Bureau of Water Resources
Massachusetts Department of Environmental Protection

Appendix B

Stormwater Bylaws and Regulations

ARTICLE XXVIII Illicit Discharge Control

Section 1. Purpose and Objectives

- A. The United States Environmental Protection Agency has identified land disturbance and polluted stormwater runoff as major sources of water pollution. Regulation of illicit connections and discharges to the municipal storm drain system is necessary for the protection of the Town of Lincoln’s water bodies and groundwater resources and to safeguard the public health, safety, and welfare and the natural resources of the Town. Increased volumes of stormwater and contaminated stormwater runoff are major causes of:
 - 1. Impairment of water quality and reduced flow in lakes, ponds, streams, rivers, wetlands, and groundwater,
 - 2. Contamination of drinking water supplies,
 - 3. Alteration or destruction of aquatic and wildlife habitat; and
 - 4. Flooding.

- B. The purpose of this Bylaw is to prohibit and eliminate illicit connections and discharges; safeguard the public health, safety, environment, and general welfare; protect aquatic resources and wildlife habitat; protect the quality and health of water resources; conserve groundwater supplies; and, foster climate change resiliency.

- C. This Bylaw seeks to meet that purpose through the following objectives:
 - 1. To prevent pollutants from entering the Town’s municipal storm drain system;
 - 2. To prohibit illicit connections and unauthorized discharges to the municipal storm drain system;
 - 3. To require the removal of all such illicit connections;
 - 4. To comply with state and federal statutes and regulations relating to stormwater discharges; and
 - 5. To establish the legal authority to ensure compliance with the provisions of this Bylaw through inspection, monitoring, and enforcement.

Section 2. Definitions

For the purposes of this Bylaw, the following shall mean:

- A. **CLEAN WATER ACT:** The Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) as hereafter amended.

- B. **DISCHARGE OF POLLUTANTS:** The addition from any source of any pollutant or combination of pollutants into the municipal storm drain system or into the waters of the United States or Commonwealth of Massachusetts from any source.

- C. **GROUNDWATER:** Water beneath the surface of the ground including confined or unconfined aquifers.

- D. **ILLICIT CONNECTION:** A surface or subsurface drain or conveyance, which allows an illicit discharge into the municipal storm drain system, including without limitation sewage,

process wastewater, or wash water and any connections from indoor drains, sinks, or toilets, regardless of whether said connection was previously allowed, permitted, or approved before the effective date of this Bylaw.

- E. **ILLICIT DISCHARGE:** Direct or indirect discharge to the municipal storm drain system that is not composed entirely of stormwater, except as exempted in Section 7. The term does not include a discharge in compliance with an NPDES Storm Water Discharge Permit or a Surface Water Discharge Permit, or resulting from firefighting activities exempted pursuant to Section 7, subsection B., of this Bylaw.
- F. **MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) or MUNICIPAL STORM DRAIN SYSTEM:** The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the Town.
- G. **NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGE PERMIT:** A permit issued by the United States Environmental Protection Agency (EPA) or jointly with the Commonwealth of Massachusetts that authorizes the discharge of stormwater to waters of the United States.
- H. **NON-STORMWATER DISCHARGE:** Discharge to the municipal storm drain system not composed entirely of stormwater.
- I. **PERSON:** An individual, partnership, association, firm, company, trust, corporation, agency, authority, department, or political subdivision of the Commonwealth of Massachusetts or the federal government, to the extent permitted by law, and any officer, employee, or agent of such person.
- J. **POLLUTANT:** Any element or property of sewage, agricultural, industrial or commercial waste, runoff, leachate, heated effluent, or other matter whether originating at a point or nonpoint source, that is considered toxic to humans or the environment and may be introduced into any sewage treatment works or waters of the Commonwealth of Massachusetts. Pollutants shall include, but not be limited to:
 - 1. paints, varnishes, and solvents;
 - 2. oil and other automotive fluids;
 - 3. non-hazardous liquid and solid wastes and yard wastes;
 - 4. refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordnances, accumulations and floatables;
 - 5. pesticides, herbicides, and fertilizers;
 - 6. hazardous materials and wastes; sewage, fecal coliform, and pathogens;
 - 7. dissolved and particulate metals;
 - 8. animal wastes;
 - 9. rock, sand, salt, and soils;

- 10. construction wastes and residues; and
 - 11. noxious or offensive matter of any kind.
- K. **PROCESS WASTEWATER:** 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.
- L. **STORMWATER:** Stormwater, snow melt, and surface water runoff and drainage.
- M. **SURFACE WATER DISCHARGE PERMIT.** A permit issued by the Department of Environmental Protection pursuant to 314 CMR 3.00 that authorizes the discharge of pollutants to waters of the Commonwealth of Massachusetts.
- N. **TOXIC OR HAZARDOUS MATERIAL OR WASTE:** 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 materials include any synthetic or organic chemical, petroleum product, heavy metal, radioactive or infectious waste, acid and alkali, and any substance defined as Toxic or Hazardous under MGL Chapter 21C and Chapter 21E, and the regulations at 310 CMR 30.000 and 310 CMR 40.0000.
- O. **WATERCOURSE:** A natural or man-made channel through which water flows, or a stream of water, including a river, brook or underground stream.
- P. **WATERS OF THE COMMONWEALTH:** All waters within the jurisdiction of the Commonwealth of Massachusetts, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, coastal waters, groundwaters, and vernal pools.
- Q. **WASTEWATER:** 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.

Section 3. Applicability

This Bylaw shall apply to flows entering the municipal storm drainage system.

Section 4. Authority

This Bylaw is adopted under authority granted by the Home Rule Amendment of the Massachusetts Constitution, the Home Rule statutes, and in accordance with the regulations of the federal Clean Water Act found at 40 CFR 122.34.

Section 5. Administration

- A. The Board of Selectmen shall administer, implement and enforce this Bylaw. Any powers granted to or duties imposed by this Bylaw may be delegated in writing to employees or agents of the Board of Health, Department of Public Works, Department of Conservation, Department of Building and Engineering, Planning Board or other Town Department.
- B. The decisions or orders issued pursuant to this Bylaw shall be final. Further relief shall be to a court of competent jurisdiction.

Section 6. Amendments and Regulations

The Board of Selectmen may promulgate rules and regulations to effectuate the purposes of this Bylaw after conducting an advertised public hearing to receive comments on any proposed revisions. The hearings shall be duly advertised in a paper of general circulation in the Town of Lincoln no less than fourteen (14) days prior to the date of the public hearing. Failure by the Board of Selectmen to promulgate such rules and regulations shall not have the effect of suspending or invalidating this Bylaw.

Section 7. Applicability and Exemptions

A. Prohibited Activities:

- 1. Illicit Discharges. No person shall dump, discharge, cause, or allow to be discharged any pollutant or non-stormwater discharge into the municipal storm drain system, into a watercourse, or into the waters of the Commonwealth of Massachusetts.
- 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 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 written approval from the Department of Public Works.

B. Exemptions:

- 1. Discharge or flow resulting from firefighting activities;
- 2. Discharge or flow that results from exigent conditions and occurs during a State of Emergency declared by any agency of the federal or state government, or by the Board of Selectmen or Board of Health.
- 3. The following non-stormwater discharges or flows are exempt from this Bylaw, provided that the source is not a significant contributor of a pollutant to the municipal storm drain system:
 - (a) Waterline flushing;
 - (b) Flow from potable water sources;
 - (c) Springs;
 - (d) Natural flow from riparian habitats and wetlands;
 - (e) Diverted stream flow;
 - (f) Rising groundwater;
 - (g) Uncontaminated groundwater infiltration as defined in 40 CFR 35.2005(20), or uncontaminated pumped groundwater;

- (h) Discharge from landscape irrigation or lawn watering;
- (i) Water from exterior foundation drains, footing drains (not including active groundwater dewatering systems), crawl space pumps, or air conditioning condensation;
- (j) Water from individual residential car washing;
- (k) Discharge from dechlorinated swimming pool water (less than one ppm chlorine) provided test data is submitted to the Town substantiating that the water meets the one ppm standard, and the pool is drained in such a way as not to cause a nuisance or public safety issue and complies with all applicable Town Bylaws;
- (l) Discharge from street sweeping;
- (m) Dye testing, provided written notification is given to the Department of Public Works prior to the time of the test;
- (n) Non-stormwater discharge permitted under an NPDES permit or a Surface Water Discharge Permit, waiver, or waste discharge order administered under the authority of the United States Environmental Protection Agency or the Department of Environmental Protection, provided that the discharge is in full compliance with the requirements of the permit, waiver, or order and applicable laws and regulations; and
- (o) Discharge for which advance written approval is received from the Board of Health or Conservation Commission as necessary to protect public health, safety, welfare or the environment.

Section 8. Emergency Suspension of Storm Drainage System Access

The Board of Selectmen 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 the public health, safety, welfare or the environment. In the event any person fails to comply with an emergency suspension order, the Board of Selectmen may take all reasonable steps to prevent or minimize harm to the public health, safety, welfare or the environment.

Section 9. Notification of Spills

Notwithstanding other requirements of local, state or federal law, as soon as a person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of or suspects a release of materials at that facility or operation resulting in or which may result in discharge of pollutants to the municipal drainage system or waters of the Commonwealth of Massachusetts, the person shall take all necessary steps to ensure containment and cleanup of the release. In the event of a release of oil or hazardous materials, the person shall immediately notify the Town's Fire and Police Departments.

Section 10. Enforcement

- A. The Board of Selectmen or an authorized agent of the Department of Public Works, Building Department or Board of Health shall enforce this Bylaw, regulations, orders, violation notices, and enforcement orders, and may pursue all civil and criminal remedies for such violations.

- B. The Board of Selectmen or an authorized agent of the Department of Public Works, Building Department or Board of Health may issue a written order to enforce the provisions of this Bylaw or the regulations thereunder, which may include:
1. Elimination of illicit connections or discharges to the municipal storm drain system;
 2. Performance of monitoring, analyses, and reporting;
 3. That unlawful discharges, practices, or operations shall cease and desist; and/or
 4. Remediation of contamination in connection therewith.
- C. If the enforcing person determines that abatement or remediation of contamination is required, 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 Town may, at its option, undertake such work, with the approval of a court of competent jurisdiction, and all costs incurred by the Town shall be charged to the violator, to be recouped through all available means, including the placement of liens on the property.
- D. Within thirty (30) 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 Town, including administrative costs. The violator or property owner may file a written protest objecting to the amount or basis of costs with the Board of Selectmen within thirty (30) 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 (30) days following a decision of the Board of Selectmen 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 owner's property for the amount of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in MGL Chapter 59, §57 after the thirty-first day at which the costs first become due.

Section 11. Entry to Perform Duties Under this Bylaw

To the extent permitted by Massachusetts law, or if authorized by the owner or other party in control of the property, the Board of Selectmen or its agents may enter upon privately owned property for the purpose of performing their duties under this Bylaw and regulations and may make or cause to be made such examinations, surveys, or sampling as the Board of Selectmen deems reasonably necessary.

Section 12. Civil Relief

If a person violates the provisions of this Bylaw, regulations, permit, notice, or order issued thereunder, the Board of Selectmen 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.

Section 13. Criminal Penalty

- A. Any person who violates any provision of this Bylaw, regulation, order or permit issued thereunder, shall be punished by a fine of not more than \$300.00. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.
- B. As an alternative to criminal prosecution or civil action, the Town may elect to utilize the non-criminal disposition procedure set forth in MGL Chapter 40, §21D, in which case the Board of Selectmen or an authorized agent of the Board of Selectmen shall be the enforcing person. The penalty for each violation shall be \$300.00. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

Section 14. Remedies Not Exclusive

The remedies listed in this Bylaw are not exclusive of any other remedies available under any applicable federal, state or local law.

Section 15. Severability

If any provision, paragraph, sentence, or clause of this Bylaw shall be held invalid for any reason, all other provisions shall continue in full force and effect.

ARTICLE XXIX Construction and Post-Construction Stormwater Management

Section 1. Purpose and Objectives

- A. The purpose of this Bylaw is to establish minimum stormwater management requirements and procedures in order to minimize damage to public and private property and infrastructure; safeguard the public health, safety, environment and general welfare; protect aquatic resources and wildlife habitat; protect the quality and health of water resources; conserve groundwater supplies; and foster climate change resiliency.
- B. This Bylaw seeks to meet that purpose through the following objectives:
 - 1. Establish the Town as the legal authority to ensure compliance with the provisions of this Bylaw and its accompanying Stormwater Management Rules and Regulations through a review process, inspections, monitoring, and enforcement.
 - 2. Establish administrative procedures for: the submission, review, and approval or disapproval of Stormwater Management Permits; the inspection of approved active projects; and post-construction monitoring.
 - 3. Establish decision-making processes surrounding new development and redevelopment that protect watershed integrity and preserve and/or restore the health of local water resources such as lakes, ponds, streams, rivers, wetlands, and groundwater.
 - 4. Ensure compliance with requirements of the United States Environmental Protection Agency (EPA), National Pollutant Discharge Elimination System (NPDES), General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) and other applicable state and federal mandates.

Section 2. Definitions

For the purposes of this Bylaw, the following shall mean:

- A. **AGRICULTURAL USE:** The normal maintenance or improvement of land in agricultural or aquacultural use, as defined by the Massachusetts Wetlands Protection Act, MGL Chapter 131, § 40, and its implementing regulations.
- B. **APPLICANT:** Any person, individual, partnership, association, firm, company, corporation, trust, or authority, agency, department, or political subdivision of the Commonwealth of Massachusetts or the federal government to the extent permitted by law requesting a Stormwater Management Permit for proposed land disturbance activity.
- C. **BEST MANAGEMENT PRACTICE (BMP):** An activity, procedure, restraint, or structural improvement that helps reduce the quantity or improve the quality of stormwater runoff.
- D. **CERTIFICATE OF COMPLETION:** Document issued by the Planning Board, its employees, or authorized agents upon receipt of a final inspection report and acknowledgement that all conditions of the Stormwater Management Permit have been satisfactorily completed.
- E. **CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC):** A certified specialist in soil erosion and sediment control. This certification program, sponsored by the Soil and Water Conservation Society in cooperation with the American Society of Agronomy, provides the public with evidence of professional qualifications.
- F. **DISTURBANCE OF LAND:** Any action that causes a change in the position, location, or arrangement of soil, sand, rock, gravel or similar earth material including but not limited to clearing and grading.
- G. **ENFORCEMENT ORDER:** A written order issued by the Planning Board or its designee to enforce the provisions of this Bylaw.
- H. **MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) or MUNICIPAL STORM DRAIN SYSTEM:** The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the Town.
- I. **NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGE PERMIT:** A permit issued by the EPA or jointly with the Commonwealth of Massachusetts that authorizes the discharge of stormwater to waters of the United States.

- J. **NEW DEVELOPMENT:** Any construction, land alteration, or addition of impervious surfaces on previously undeveloped sites resulting in a Disturbance of Land 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 Redevelopment.
- K. **OWNER:** A person with a legal or equitable interest in property.
- L. **PERSON:** An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the Commonwealth of Massachusetts or the federal government, to the extent permitted by law, and any officer, employee, or agent of such person.
- M. **PLANNING BOARD:** Town of Lincoln Planning Board, its employees, or authorized agents designated to enforce this Bylaw.
- N. **PROFESSIONAL ENGINEER (P.E.):** A registered Professional Engineer within the Commonwealth of Massachusetts in good standing.
- O. **REDEVELOPMENT:** Development, rehabilitation, expansion, demolition, or phased projects that disturb the ground surface or increase the impervious area on previously developed sites. Any construction, land alteration, or improvement of impervious surfaces resulting in a Disturbance of Land equal to or greater than 1 acre (or activities that are part of a larger common plan of redevelopment disturbing greater than 1 acre) that does not meet the definition of New Development.
- P. **STORMWATER:** Stormwater runoff, snow melt runoff, and surface water runoff and drainage.
- Q. **STORMWATER MANAGEMENT PERMIT:** The written approval granted by the Planning Board to undertake a construction activity pursuant to a Stormwater Management Permit Application. A valid Stormwater Management Permit must be signed by a majority of the Planning Board participating at a duly noticed public hearing, and such permit must be recorded at the Middlesex South Registry of Deeds, prior to the start of any work.
- R. **WATERS OF THE COMMONWEALTH:** All waters within the jurisdiction of the Commonwealth of Massachusetts including without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, coastal waters, groundwaters, and vernal pools.
- S. **WETLAND RESOURCE AREAS:** Areas specified in the Massachusetts Wetlands Protection Act Regulations, 310 CMR 10.00, as amended, or in the Town of Lincoln Bylaw XVIII Wetlands Protection Bylaw, as amended.

Section 3. Authority

This Bylaw is adopted under authority granted by the Home Rule Amendment of the Massachusetts Constitution, the Home Rule statutes, and pursuant to the Regulations of the

federal Clean Water Act found at 40 CFR 122.34.

Section 4. Administration

- A. The Planning Board shall be the Permit Granting Authority (PGA) for this Bylaw. Any powers granted to or duties imposed upon the Planning Board may be delegated by the Planning Board to any Town employee, board, commission, committee or agent, hereby known as the “Reviewing Agent.”
- B. The Planning Board shall not have jurisdiction over stormwater issues within areas where the Conservation Commission has jurisdiction under the Wetlands Protection Act, the Town’s Wetlands Protection Bylaw.
- C. The Planning Board or its Reviewing Agent shall take any of the following actions as a result of an application for a Stormwater Management Permit as specifically defined within the Stormwater Management Rules and Regulations promulgated as a result of this Bylaw: Approval, Approval with Conditions, or Disapproval.
- D. A decision of the Planning Board or its Reviewing Agent shall be final. Further relief of a decision by the Planning Board or its Reviewing Agent made under this Bylaw may be sought in a court of competent jurisdiction in accordance with MGL Chapter 249 §4.

Section 5. Amendments and Regulations

The Planning Board may adopt, and periodically amend, the Stormwater Management Rules and Regulations relating to the terms, conditions, definitions, enforcement, fees (including application, inspection, and/or consultant fees), procedures and administration of this Bylaw by majority vote of the Planning Board, after conducting an advertised public hearing to receive comments on any proposed revisions. The hearings shall be duly advertised in a paper of general circulation in the Town of Lincoln no less than fourteen (14) days prior to the date of the public hearing. Failure by the Planning Board to promulgate such rules and regulations shall not have the effect of suspending or invalidating this Bylaw.

Section 6. Applicability and Exemptions

- A. No person may undertake a construction activity, including clearing, grading, or excavation that results in a Disturbance of Land to an area equal to or greater than one (1) acre of land or will disturb less than one acre of land but is part of a larger common plan of development or sale that will ultimately disturb an area equal to or greater than one (1) acre of land within the Town without first obtaining a Stormwater Management Permit issued by the Planning Board.
- B. Exemptions:
 - 1. Normal maintenance and improvement of land in agricultural use as defined by the Wetlands Protection Act regulation 310 CMR 10.04, as amended;
 - 2. Maintenance of existing landscaping, gardens, or lawn areas associated with a single-family dwelling;

3. Removal of native plants, invasive growth, or other vegetation by methods that do not disturb underlying soils or ground conditions;
4. The construction of fencing that will not substantially alter existing terrain or drainage patterns;
5. Normal maintenance and improvements of the Town's publicly owned roadways and associated drainage infrastructure; and
6. Emergency repairs to any stormwater management system or feature that poses a threat to public health or safety, or as deemed necessary by a Town department or board.
7. Projects that are wholly subject to jurisdiction under the Wetlands Protection Act and/or the Town's Wetlands Protection Bylaw and demonstrate compliance with the Massachusetts Stormwater Handbook and Stormwater Standards as reflected in an Order of Conditions issued by the Conservation Commission; and
8. Incidental disturbance of ground cover related to project construction as a result of construction access, placement of erosion controls, vegetation clearing that does not disturb soils or similar activity does not count towards the one (1) acre Disturbance of Land under this Bylaw.

Section 7. Enforcement

- A. The Planning Board, or an authorized agent of the Planning Board, shall enforce this Bylaw, regulations, orders, violation notices, and enforcement orders, and may pursue all civil and criminal remedies for such violations.
- B. The Planning Board may issue a written order to enforce the provisions of this Bylaw, which may include requirements to:
 1. Cease and desist from construction or land disturbing activity until there is compliance with this Bylaw and the Stormwater Management Permit;
 2. Repair, maintain, or replace the stormwater management system or portions thereof in accordance with the operation and maintenance plan;
 3. Maintain, install, or perform additional erosion and sediment control measures;
 4. Perform monitoring, analyses, and reporting;
 5. Remediate adverse impact resulting directly or indirectly from malfunction of the stormwater management system or erosion and sediment control system;
 6. Cease and desist from unlawful discharges, practices, or operations; and/or,
 7. Remediate contamination in connection therewith.
- C. If the Planning Board determines that abatement or remediation of adverse impacts is required, the Enforcement 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 Town may, at its option, with the approval of a court of competent jurisdiction, undertake such work, and the property owner shall reimburse the Town's expense.
- D. Within thirty (30) days after completing all measures necessary to abate the violation, the violator and the property owner shall be notified of the costs incurred by the Town, including administrative costs. The violator or property owner may file a written protest objecting to

the amount or basis of costs with the Planning Board within thirty (30) 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 (30) days following a decision of the Planning Board 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 owner's property for the amount of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in MGL Chapter 59, § 57, after the thirty-first day at which the costs first become due.

Section 8. Entry to Perform Duties Under this Bylaw

To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the Planning Board or its agents may enter upon privately owned property for the purpose of performing their duties under this Bylaw and regulations and may make or cause to be made such examinations, surveys, or sampling as the Planning Board or agent deems reasonably necessary.

Section 9. Waivers and Provisions for Relief

- A. Planning Board may waive strict compliance with any requirement of this Bylaw promulgated hereunder, where:
 - 1. Such action is allowed by federal, state and local statutes and/or regulations,
 - 2. It is in the public interest,
 - 3. A public safety issue exists, or
 - 4. It is consistent with the purpose and intent of this Bylaw.
- B. Any applicant may submit a written request to be granted such a waiver. Such a request shall be accompanied by an explanation or documentation supporting the waiver request and demonstrating that strict application of this Bylaw does not further the purposes or objectives of this Bylaw. The Planning Board may require documentation to be submitted and stamped by a qualified P.E. registered in Massachusetts or a Certified Professional in Erosion and Sediment Control (CPESC).

Section 10. Civil Relief

If a person violates the provisions of this Bylaw, permit, notices, or order issued thereunder, the Planning Board 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.

Section 11. Criminal Penalty

- A. Any person who violates any provision of this Bylaw, order, or permit issued thereunder, shall be punished by a fine of not more than \$300. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.
- B. As an alternative to criminal prosecution or civil action, the Town may elect to utilize the non-criminal disposition procedure set forth in MGL Chapter 40, §21D, in which case the

Board of Selectmen or an authorized agent of the Board of Selectmen shall be the enforcing person. The penalty for each violation shall be \$300.00. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

Section 12. Remedies Not Exclusive

The remedies listed in this Bylaw are not exclusive of any other remedies available under any applicable federal, state, or local law.

Section 13. Surety

The Planning Board may require the permittee to post, before the start of land disturbance or construction activity, a surety bond, irrevocable letter of credit, cash, or other acceptable security. The form of the bond shall be approved by Town Counsel, and be in an amount deemed sufficient by the Planning Board to ensure that the work will be completed in accordance with the permit. If the project is phased, the Planning Board may release part of the bond as each phase is completed in compliance with the Stormwater Management Permit but the bond may not be fully released until the Planning Board has received the final inspection report as required by the Stormwater Management Rules and Regulations and issued a Certificate of Completion.

Section 14. Severability

If any provision, paragraph, sentence, or clause of this Bylaw shall be held invalid for any reason, all other provisions shall continue in full force and effect.

STORMWATER MANAGEMENT RULES AND REGULATIONS

Lincoln Planning Board

Adopted: July 27, 2021

1.0 Purpose

The purpose of these rules and regulations is to establish Stormwater Management Rules and Regulations for the Town of Lincoln Stormwater Management Bylaw.

2.0 Authority

The Lincoln Planning Board, under the authority of Article XXIX of the General Bylaws of the Town of Lincoln, and after holding a duly called Public Hearing on July 27, 2021, adopts these Stormwater Management Rules and Regulations.

3.0 Definitions

3.1. For the purposes of these rules and regulations, the following shall mean:

- (1) **ABUTTER:** The owner(s) of land abutting the site on which the activity occurs as defined by a certified abutter list issued by the Town of Lincoln assessor's office.
- (2) **APPLICANT:** Any person, individual, partnership, association, firm, company, corporation, trust, authority, agency, department, or political subdivision, of the Commonwealth of Massachusetts or the federal government to the extent permitted by law requesting a Stormwater Management Permit for proposed land-disturbance activity.
- (3) **BEST MANAGEMENT PRACTICE (BMP):** An activity, procedure, restraint, or structural improvement that helps reduce the quantity or improve the quality of stormwater runoff.
- (4) **CERTIFICATE OF COMPLETION:** A document issued by the Town of Lincoln Permit Granting Authority, its employees, or authorized agents upon receipt of a final inspection report and certification by the Applicant's licensed Professional Engineer (P.E.) that all conditions of the Stormwater Management Permit have been satisfactorily completed.
- (5) **CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC):** A certified specialist in soil erosion and sediment control. This certification program, sponsored by the Soil and Water Conservation Society in cooperation with the American Society of Agronomy, provides the public with evidence of professional qualifications.

- (6) **CERTIFIED VERNAL POOLS:** Temporary bodies of freshwater that provide critical habitat for a number of vertebrate and invertebrate wildlife species, certified by the Massachusetts Natural Heritage and Endangered Species Program (NHESP).
- (7) **CLEARING:** Any activity that removes vegetative surface cover.
- (8) **CONSTRUCTION WASTE AND MATERIALS:** Excess or discarded building or site materials, including but not limited to concrete truck washout, chemicals, litter, and sanitary waste at a construction site that may adversely impact water quality.
- (9) **DISCHARGE OF POLLUTANTS:** The addition from any source of any pollutant or combination of pollutants into the municipal storm drain system or into the Waters of the Commonwealth of Massachusetts from any source.
- (10) **DISTURBANCE OF LAND:** Any action that alters 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.
- (11) **DPW:** Lincoln Department of Public Works.
- (12) **EROSION:** The wearing away of the land surface by natural or artificial forces such as wind, water, ice, gravity, or vehicle traffic and the subsequent detachment and transportation of soil particles.
- (13) **EROSION AND SEDIMENT CONTROL PLAN:** A document containing narrative, drawings, and details developed by a licensed Professional Engineer or CPESC, which includes BMPs, or equivalent measures designed to control surface runoff, erosion, and sedimentation during pre-construction and construction-related land disturbance activities.
- (14) **ESTIMATED HABITAT OF RARE WILDLIFE:** Habitats delineated by the NHESP for state-protected rare wildlife and certified vernal pools for use with the Wetlands Protection Act Regulations (310 CMR 10.00) and the Forest Cutting Practices Act Regulations (304 CMR 11.00).
- (15) **GRADING:** Changing the level or shape of the ground surface.
- (16) **GROUNDWATER:** Water beneath the surface of the ground including confined or unconfined aquifers.
- (17) **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, impervious artificial turf and compacted gravel or soil.

- (18) **INFEASIBLE:** means not technologically possible, or not economically practicable and achievable in light of best industry practices.
- (19) **LOW IMPACT DEVELOPMENT (LID):** An approach to land development design and stormwater management that attempts to mimic the natural hydrology of the site by avoiding, reducing, and mitigating impacts with natural, non-structural, and structural measures.
- (20) **MASSACHUSETTS ENDANGERED SPECIES ACT (MESA):** (G.L. c. 131A) and its implementing regulations at (321 CMR 10.00). This Act prohibits the "taking" of any rare plant or animal species listed as "Endangered", "Threatened", or of "Special Concern".
- (21) **MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS:** The Stormwater Management Standards promulgated by the Massachusetts Department of Environmental Protection (DEP) under the authority of the Massachusetts Wetlands Protection Act G.L. c. 131 § 40 and Massachusetts Clean Waters Act G.L. c. 21, §. 23-56, and further described in the Wetlands Protection Act Regulations (310 CMR 10.00) and the 401 Water Quality Certification Regulations (314 CMR 9.00). The Stormwater Management Standards address stormwater impacts through implementation of performance standards to reduce or prevent pollutants from reaching water bodies and to control the quantity of runoff from a site.
- (22) **MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) or MUNICIPAL STORM DRAIN SYSTEM:** The system of conveyances designed or used for collecting or conveying stormwater, including any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, reservoir, and other drainage structure that together comprise the storm drainage system owned or operated by the Town of Lincoln, MA.
- (23) **NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGE PERMIT:** A permit issued by the United States Environmental Protection Agency (EPA) or jointly with the Commonwealth of Massachusetts that authorizes the discharge of stormwater to Waters of the Commonwealth.
- (24) **NEW DEVELOPMENT:** 1. Any construction activities or land alteration resulting in total Disturbance of Land equal to or greater than one acre; or 2. Any construction activities or land alteration that are part of a larger common plan of development resulting in Disturbance of Land equal to or greater than one acre.
- (25) **NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM (NHESP):** The Commonwealth of Massachusetts' program for implementing MESA requirements.

- (26) OPERATION AND MAINTENANCE PLAN (OMP): A plan setting up the functional, financial, and organizational mechanisms for the ongoing operation and maintenance of a stormwater management system to ensure that it continues to function as designed.
- (27) OUTFALL: The point where stormwater flows out from a point source which is a discernible, confined, and discrete conveyance into Waters of the Commonwealth.
- (28) OWNER: A person with a legal or equitable interest in property.
- (29) PERSON: An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the Commonwealth of Massachusetts or the federal government, to the extent permitted by law, and any officer, employee, or agent of such person.
- (30) PLANNING BOARD: Town of Lincoln Planning Board, its employees, or authorized agents designated to enforce these regulations.
- (31) POINT SOURCE: Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, or container from which stormwater is or may be discharged.
- (32) POLLUTANT: Any element or property of sewage, agricultural, industrial, or commercial waste, runoff, leachate, heated effluent, or other matter whether originating at a point or non-point source, that is or may be introduced into any sewage treatment works or Waters of the Commonwealth. Pollutants shall include, but are not limited to:
- (a) Chemicals, paints, varnishes, and solvents;
 - (b) Oil and other automotive fluids;
 - (c) Non-hazardous liquid and solid wastes and yard wastes;
 - (d) Refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordnances, accumulations, and floatables;
 - (e) Pesticides, herbicides, and fertilizers;
 - (f) Hazardous materials and wastes, sewage, fecal coliform, and pathogens;
 - (g) Dissolved and particulate metals;
 - (h) Animal wastes;
 - (i) Rock, sand, salt, and soils;
 - (j) Concrete truck washout;
 - (k) Sanitary wastes;
 - (l) Construction wastes, demolition debris, and discarded building materials; and,
 - (m) Noxious or offensive matter of any kind.
- (33) PRIORITY HABITAT OF RARE SPECIES: Habitats delineated for rare plant and animal populations protected pursuant to the MESA and its regulations.

- (34) RECHARGE: The process by which groundwater is replenished by precipitation through the percolation of runoff and surface water through soil.
- (35) REDEVELOPMENT: any construction, land alteration, or improvement of impervious surfaces resulting in total Disturbance of Land equal to or greater than one acre: or 2. Activities that are part of a larger common plan of development resulting in a Disturbance of Land equal to one acre or more that does not meet the definition of New Development.
- (36) RUNOFF: Rainfall, snow melt, or irrigation water flowing over the ground surface.
- (37) SEDIMENT: Mineral or organic soil material that is transported by wind or water from its origin to another location; the product of erosion processes.
- (38) SEDIMENTATION: The process or act of deposition of sediment.
- (39) SITE: Any lot, parcel of land, or area of property where land-disturbing activities are, were, or will be performed.
- (40) SLOPE: The incline of a ground surface expressed as a ratio of horizontal distance to vertical distance.
- (41) SOIL: Any earth, sand, rock, gravel, or similar material.
- (42) STABILIZATION: The use, singly or in combination, of mechanical, structural, or vegetative methods, to prevent or minimize erosion.
- (43) STORMWATER: Stormwater, snow melt, and surface water runoff and drainage.
- (44) STORMWATER MANAGEMENT PERMIT: The written approval granted by the Permit Granting Authority to undertake a construction activity in response to a Stormwater Management Permit Application.
- (45) STORMWATER MANAGEMENT PLAN: A plan required as part of the application for a Stormwater Management Permit.
- (46) TOXIC OR HAZARDOUS MATERIAL OR WASTE: 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 materials include any synthetic or organic chemical, petroleum product, heavy metal, radioactive, biological, or infectious waste, acid and alkali, and 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 40.0000.

- (47) TOTAL SUSPENDED SOLIDS (TSS): Sediment being carried in stormwater.
- (48) WATERCOURSE: A natural or man-made channel through which water flows, or a stream of water, including a river, brook, or underground stream.
- (49) WATERS OF THE COMMONWEALTH: All waters within the jurisdiction of the Commonwealth of Massachusetts, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, coastal waters, groundwaters, and vernal pools.
- (50) WETLAND RESOURCE AREAS: Areas specified in the Massachusetts Wetlands Protection Act Regulations, 310 CMR 10.00, as amended, and in the Town of Lincoln Wetlands Protection Bylaw, as amended.

4.0 Amendments

The Planning Board may adopt, and periodically amend, these Stormwater Management Rules and Regulations by majority vote of the Planning Board, after conducting a minimum of an advertised public hearing to receive comments on any proposed revisions. The hearings shall be duly advertised in a paper of general circulation in the Town of Lincoln no less than fourteen (14) days prior to the date of the public hearing.

5.0 Applicability

These rules and regulations apply to all projects meeting the applicability criteria of the Stormwater Management Bylaw (Chapter XXIX of the Town's General Bylaws). New Development and Redevelopment projects must comply with the rules and regulations contained herein unless expressly waived by the Permit Granting Authority. [Normal maintenance and improvement of land in agricultural or aquacultural use as defined in 310 CMR 10.04 is exempt from the requirement of these Regulations.](#)

6.0 Procedure and Requirements

No Building Permit shall issue without confirmation that a Stormwater Management Permit has been obtained or is otherwise not required.

- 6.1. Permit Granting Authority: The following Town boards and commissions or their designees shall serve as the Permit Granting Authority (PGA) as described below and their respective permits may serve as the Stormwater Management Permit upon a finding that the Project has demonstrated compliance with these rules and regulations:
 - (1) Planning Board: Any Site Plan Approval, Subdivision Approval, or Special Permit Approval issued by the Lincoln Planning Board shall serve as the Stormwater Management Permit, provided the project demonstrates compliance with these rules and regulations and the decision includes a finding as such.

- (2) Conservation Commission: An Order of Conditions issued by the Lincoln Conservation Commission may serve as the Stormwater Management Permit, provided the project demonstrates compliance with these rules and regulations and the Order includes a finding as such. In the event that an Order of Conditions is issued by the Conservation Commission to serve as the Stormwater Management Permit, a copy of such Order of Conditions shall be provided to the Planning Department.
- (3) In cases where the above boards or commissions do not include a clear finding of compliance with these rules and regulations or when none of the above permits are required, the Planning Board shall serve as the Stormwater Management PGA.

6.2. Application.

- (1) The site owner or his/her agent shall file with the Permit Granting Authority, two (2) paper copies and one digital copy of a completed Stormwater Management Permit Application package. Permit issuance is required prior to any applicable site-altering activity. While the Applicant may be a representative of the owner of the site, the Stormwater Management Permit must be issued to the owner of the site.
- (2) The Permit Granting Authority shall provide one (1) copy of a completed Stormwater Management Permit Application package to the Conservation Commission.
- (3) Stormwater Management Permit Application package:
 - (a) Completed Application Form with original signatures of all owners;
 - (b) List of abutters within 300-feet of the project as certified by the Assessors' Office;
 - (c) Two (2) paper copies and one digital copy of the Stormwater Management Plan as specified in Section 7.0;
 - (d) Two (2) paper copies and one digital copy of the Erosion Control Plan as specified in Section 8.0;
 - (e) Two (2) paper copies and one digital copy of the Operation and Maintenance Plan as specified in Section 9.0;
 - (f) Payment of any application and review fees.

6.3. Fee Structure.

- (1) The Applicant shall submit with each Application, an Application Fee payable to the Town of Lincoln. Applicants shall pay review fees as listed below to cover any expenses connected with the public hearing and review of the Stormwater Management Permit Application before the review process commences. The Permit Granting Authority may, at the Applicant's expense, retain a licensed P.E. or other professional consultant to advise the Permit Granting Authority on any or all aspects of these plans.
 - (a) Application fee for single family residence\$100
 - (b) Application fee for projects from 1 to 2 acres\$200
 - (c) Application fee for projects from 3 to 10 acres\$300
 - (d) Application fee for projects greater than 10 acres\$500

- (e) Application fee for a resubmittal / amendment.....\$100
- (f) Fees for a professional peer review Assessed on a case by case basis.

(2) In addition to the above fee, the PGA is authorized to require an Applicant to pay an initial fee of up to \$5,000.00 for the reasonable costs and expenses associated with retaining specific expert engineering and other peer review consultant services deemed necessary by the PGA. Payment may be required at any point during the PGA’s deliberations prior to a final decision. The PGA shall notify the Applicant of such amount in writing. Failure to submit such amount within 14 days of receipt of said notice shall be deemed sufficient reason by the PGA to deny said application.

- (a) If the PGA finds that the initial fee is insufficient to cover the costs and expenses associated with specific expert engineering and other peer review consultant services necessary for review of the application and to monitor the construction of the project, the PGA may require the Applicant to submit any additional funding required to fund peer review services. The PGA shall notify the Applicant of any additional funding required in writing. Failure to submit such additional amount of funds to the PGA within 14 days of receipt of said notice shall be deemed an adequate reason by the PGA to deny said application.
- (b) Such fee shall be held in escrow, to be used to engage independent expert engineering and other peer review consultant services and shall be governed and administered in accordance with G.L c. 44, § 53G or § 53E 1/2.
- (c) If the actual cost incurred by the Town for review of said application is less than the amount on deposit as specified above, the PGA shall authorize that such excess amount be refunded to the Applicant upon issuance of the Certificate of Completion.
- (d) The services for which a fee may be utilized include, but are not limited to, review of wetland survey and delineation, hydrologic and drainage analysis, wildlife evaluation, stormwater quality analysis, site inspections, as-built plan review, and analysis of legal issues.

6.4. Entry. Filing an application for a permit grants the Permit Granting Authority, and its agents, permission to enter the site throughout the construction project to verify the information in the application and to inspect for compliance with the resulting permit.

6.5. Information Requests. The Permit Granting Authority may request, and the Applicant shall submit additional information and/or documentation at any time prior to the issuance of the Certificate of Completion.

6.6. Actions. The Permit Granting Authority’s action, rendered in writing, shall consist of either:

- (1) “Approval” of the Stormwater Management Permit Application based upon determination that the proposed Stormwater Management Plan meets the Standards as set forth in Section 7.3 herein and will adequately protect the water

resources of the community and complies with the requirements set forth in these rules and regulations;

- (2) “Approval with Conditions” of the Stormwater Management Permit Application subject to any conditions, modifications, or restrictions required by the Permit Granting Authority that will ensure the proposed Stormwater Management Plan meets the Standards and will adequately protect the water resources of the community and complies with the requirements set forth in these rules and regulations;
- (3) “Disapproval” of the Stormwater Management Permit Application based upon determination that the proposed Stormwater Management Plan, as submitted, does not meet the Standards, or will not adequately protect the water resources of the community and does not comply with the requirements set forth in these rules and regulations.

6.7. Appeals. A decision of the Permit Granting Authority shall be final. The Applicant may appeal the decision to a court of competent jurisdictions in the time allowed by law.

6.8. Plan Changes. The Applicant must notify the Permit Granting Authority in writing of any drainage change or alteration in the system authorized in the Stormwater Management Permit before any change or alteration is made. If the Permit Granting Authority determines that the change or alteration is significant, based on the Standards, the requirements set forth in these rules and regulations, or accepted construction practices, the Permit Granting Authority may require that an amended application be filed. If any change or alteration from the Stormwater Management Permit occurs during any land disturbing activities, the Permit Granting Authority may require the installation of interim erosion and sedimentation control measures before approving the change or alteration.

6.9. Stormwater Pollution Prevention Plans (SWPPPs). Applicants may be required to prepare a SWPPP to satisfy US EPA requirements under the NPDES Construction General Permit (CGP). Applicants are responsible for verifying requirements and preparing a SWPPP in full compliance with CGP regulations, as well as filing any additional materials with EPA, such as a Notice of Intent (NOI).

7.0 Stormwater Management Plan

7.1. The Stormwater Management Plan shall contain sufficient information for the Permit Granting Authority to evaluate the environmental impact, effectiveness, and acceptability of the measures proposed by the Applicant for reducing adverse impacts from stormwater. The Stormwater Management Plan shall be designed to meet the Standards as set forth in 7.3 below, and the latest version of the Massachusetts Department of Environmental Protection (DEP) Stormwater Handbook.

7.2. The Stormwater Management Plan shall fully describe the project in engineering plans, drawings, and narrative. It shall include, at a minimum, the following:

- (1) Names, addresses, telephone numbers, and email addresses of the owner, Applicant, and person(s) or firm(s) preparing the plan;
- (2) Project Narrative containing relevant information related to stormwater requirements;
- (3) Locus Map of the Site;
- (4) Any Conservation Restriction, Conservation Commission Restriction, Restrictive Covenant, or Conservation Deed Restrictions for the site;
- (5) Description of existing and proposed conditions;
- (6) Existing and Proposed Zoning and Land Use at the Site;
- (7) Existing and Proposed Easements and Utilities at the Site;
- (8) Existing Conservation Land as owned by the Town of Lincoln or neighboring community;
- (9) Existing and Proposed Topography (1-foot interval contours with additional spot grades as needed to depict detailed drainage patterns) at the Site;
- (10) Existing and Proposed hydrology, watershed boundaries, drainage area, and stormwater flow paths;
- (11) Existing and Proposed Stormwater Conveyances, Impoundments, and Wetlands into which stormwater flows at and adjacent to the Site;
- (12) Existing and Proposed 100-year flood plain, if applicable;
- (13) High Groundwater Elevation (November to April) as determined via completion of representative test pits or other geological investigations in areas to be used for stormwater retention, detention, or infiltration;
- (14) Description of subsurface conditions in areas to be used for stormwater retention, detention, or infiltration;
- (15) Evaluation of opportunities for using Low Impact Development (LID) and green infrastructure techniques and BMPs;
- (16) Plans, Drawings and Descriptions of Proposed Drainage System and all components including:
 - (a) Locations, cross-sections, and profiles of stormwater conveyances such as drainage swales and their method of stabilization;
 - (b) All measures for the detention, retention, and/or infiltration of stormwater;
 - (c) All measures for the protection of water quality;
 - (d) The structural details and sizing for all components of the proposed drainage systems and stormwater management facilities;
 - (e) Notes on drawings specifying materials to be used, construction specifications, and typical details and cross-sections;
 - (f) Analysis of existing and proposed hydrology with supporting calculations;
 - (g) Calculations supporting the estimate of stormwater treatment performance;
 - (h) Calculations supporting the design of infiltration practices, including design infiltration rates, estimated dewatering times, and mounding analyses, where applicable.
- (17) Stormwater runoff shall be calculated using latest Northeast Regional Climate Center (NRCC) extreme precipitation amounts for recurrence intervals (storm events) 2-, 10-, 25-, 50- and 100-year frequencies.

- (18) Any supplemental materials filed with US EPA under the CGP, such as a SWPPP and/or NOI as outlined in Section 6.9;
- (19) Documents must be stamped and certified by a qualified licensed P.E.; and,
- (20) Any other information requested by the Permit Granting Authority.

7.3. Stormwater Management Standards (“Standards”). Projects shall meet the following Standards:

- (1) No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or Waters of the Commonwealth.
- (2) Low Impact Development (LID) site planning and design strategies must be implemented unless determined Infeasible by the PGA to reduce the discharge of stormwater from development sites;
- (3) Stormwater management system design shall be consistent with, or more stringent than, the requirements of the latest version of the Massachusetts DEP Stormwater Handbook;
- (4) 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 post-construction impervious surface area on the site.
 - (a) Average annual pollutant removal requirements in 7.3.(4) are achieved through one of the following methods:
 - i. Installing BMPs that meet the pollutant removal percentages based on calculations developed consistent with US EPA Region 1’s BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by US EPA Region 1, where available. If US 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
 - ii. Retaining the volume of runoff equivalent to, or greater than, 1.0 inch multiplied by the total post-construction impervious surface area on the new development site; or
 - iii. Meeting a combination of retention and treatment that achieves the above standards; or
 - iv. Utilizing offsite mitigation that meets the above standards within the same USGS HUC12 as the new development site.
- (5) Stormwater management systems on Redevelopment sites shall be designed to meet an average annual pollutant removal equivalent to 80% of the average annual post-construction load of TSS related to the total post-construction impervious area on the site AND 50% of the average annual load of TP related to the total post-construction impervious surface area on the site.

- (a) Average annual pollutant removal requirements in 7.3.(5) are achieved through one of the following methods:
 - i. Installing BMPs that meet the pollutant removal percentages based on calculations developed consistent with US EPA Region 1's BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by US EPA Region 1, where available. If US 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
 - ii. Retaining the volume of runoff equivalent to, or greater than, 0.8 inches multiplied by the total post-construction impervious surface area on the redevelopment site; or
 - iii. Meeting a combination of retention and treatment that achieves the above standards; or
 - iv. Utilizing offsite mitigation that meets the above standards within the same USGS HUC12 as the redevelopment site.
- (6) 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 Section 7.3.(5). 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 Section 7.3.(5).

8.0 Erosion and Sediment Control Plan

- 8.1. . The Erosion and Sediment Control Plan shall contain sufficient information for the Permit Granting Authority about the nature and purpose of the proposed development, pertinent conditions of the site and adjacent areas, proposed erosion and sedimentation controls, and proposed control for other wastes on construction sites such as demolition debris, litter, and sanitary wastes to ensure they are not discharged into the MS4, drainage system, or Waters of the Commonwealth of Massachusetts. The Applicant shall submit such material as is necessary to show that the proposed development will comply with the design requirements as follows:
- (1) Minimize total area of disturbance;
 - (2) Sequence activities to minimize simultaneous areas of disturbance;
 - (3) Installing erosion and sediment controls prior to the commencement of any construction activity;
 - (4) Minimize soil erosion and control sedimentation during construction, provided that prevention of erosion is preferred over sedimentation control;
 - (5) Divert uncontaminated water around disturbed areas;
 - (6) Maximize infiltration and groundwater recharge;

- (7) Install, inspect, and maintain all Erosion and Sediment Control measures in accordance with the manufacturer's specifications and good engineering practices;
- (8) Prevent off-site transport of sediment and wastes;
- (9) Protect all storm drain inlets and armor all newly constructed outlets;
- (10) Protect and manage on and off-site material storage areas (overburden and stockpiles of dirt, borrow areas, or other areas used solely by the permitted project are considered a part of the project);
- (11) Comply with applicable federal, state, and local laws and regulations including waste disposal, sanitary sewer or septic system regulations, and air quality requirements, including dust control;
- (12) Institute interim and permanent stabilization measures, which shall be instituted on a disturbed area as soon as practicable but no more than fourteen (14) days after construction activity has temporarily or permanently ceased on that portion of the site;
- (13) Properly manage on-site construction waste and materials;
- (14) Stabilize construction site entrances and exits and prevent off-site vehicle tracking of sediments; and,
- (15) Ensure that any stormwater BMP (for post-construction stormwater management) installed during construction will be protected from compaction, siltation, and erosion or will be restored or replaced such that the BMP will be capable of functioning as designed in accordance with these stormwater regulations.

8.2. The content of the Erosion and Sediment Control Plan shall contain the following information:

- (1) Names, addresses, telephone numbers, and email addresses of the owner, Applicant, and person(s) or firm(s) preparing this plan;
- (2) Title, date, north arrow, names of abutters, scale, legend, and locus map;
- (3) Location and description of natural features including:
 - (a) Watercourses and water bodies, wetland resource areas, and all floodplain information, including the 100-year flood elevation based upon the most recent Flood Insurance Rate Map, or as calculated by a qualified P.E. for areas not assessed on these maps;
 - (b) Existing vegetation including tree lines, canopy layer, shrub layer, and ground cover, and trees with a caliper twelve (12) inches or larger, noting specimen trees and forest communities; and,
 - (c) Habitats mapped by the Massachusetts Natural Heritage & Endangered Species Program as Endangered, Threatened or of Special Concern, Estimated Habitats of Rare Wildlife, and Certified Vernal Pools, and Priority Habitats of Rare Species within five hundred (500) feet of any construction activity.
- (4) Lines of existing abutting streets showing drainage and driveway locations and curb cuts;
- (5) Existing soils, volume, and nature of imported soil materials;

- (6) Topographical features including existing and proposed contours at intervals no greater than one (1) foot with spot elevations provided when needed;
- (7) Surveyed property lines showing distances and monument locations, all existing and proposed easements, rights-of-way, and other encumbrances, the size of the entire parcel, and the delineation and number of square feet of the land area to be disturbed;
- (8) Drainage patterns and approximate slopes anticipated after major grading activities;
- (9) Location and details of erosion and sediment control measures with a narrative of the construction sequence/phasing of the project, including both operation and maintenance for structural and non-structural measures, interim grading, and material stockpiling areas;
- (10) Path and mechanism to divert uncontaminated water around disturbed areas, to the maximum extent practicable;
- (11) Location and description of and implementation schedule for temporary and permanent seeding, vegetative controls, and other stabilization measures;
- (12) A description of construction and waste materials expected to be stored on-site. The Plan shall include a description of controls to reduce pollutants from these materials, including storage practices to minimize exposure of the materials to stormwater, and spill prevention and response;
- (13) A description of provisions for phasing the project where one acre of area or greater is to be altered or disturbed;
- (14) A description of how the project owner will inspect the site during the course of construction to monitor the management of stormwater in accordance with applicable town, state, and federal regulations;
- (15) Plans must be stamped and certified by a qualified Professional Engineer or a Certified Professional in Erosion and Sediment Control (CPESC); and,
- (16) Such other information required by the Permit Granting Authority.

9.0 Operation and Maintenance Plan

9.1. The Operation and Maintenance Plan (OMP) shall be designed to ensure ongoing compliance with the Stormwater Management Permit, these rules and regulations, and that the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, are met in all seasons and throughout the life of the system. The Permit Granting Authority shall make the final determination of what maintenance option is appropriate in any given situation. The Permit Granting Authority will consider natural features, proximity of the site to MS4 infrastructure, proximity of the site to waterbodies and wetlands, extent of impervious surfaces, size of the site, the types of stormwater management structures, and potential need for ongoing maintenance activities when making this decision. The OPM shall remain on file with the Permit Granting Authority and shall be an ongoing requirement. The OMP shall include:

- (1) The name(s) of the owner(s) of all components of the system;
- (2) Maintenance agreements that specify:
 - (a) Names, addresses, telephone numbers, and email addresses of the person(s) responsible for operation and maintenance

- (b) The person(s) and their contact information responsible for financing maintenance and emergency repairs.
 - (c) A Maintenance Schedule that includes routine inspection along with routine and non-routine maintenance tasks for each BMP.
 - (d) A list of easements, if applicable, with the purpose and location of each.
 - (e) The signature(s) of the owner(s).
 - (f) Estimated operation and maintenance budget.
 - (g) The responsible party shall:
 - i. Maintain a log of all operation and maintenance activities for the last three years including inspections, repair, replacement, and disposal (the log shall indicate the type of material and the disposal location);
 - ii. Make this log available to the Permit Granting Authority and the Commonwealth of Massachusetts upon request; and,
 - iii. Allow Massachusetts DEP and the Town of Lincoln to inspect each BMP to determine whether the responsible party is implementing the Operation and Maintenance Plan.
- (3) Stormwater Management Easement(s).
- (a) Stormwater management easements shall be provided by the property owner(s) if the Permit Granting Authority deems necessary for:
 - i. Access for facility inspections and maintenance;
 - ii. Preservation of stormwater runoff conveyance, infiltration, and detention areas and facilities, including flood routes for the 100-year storm event; and,
 - iii. Direct maintenance access by heavy equipment to structures requiring regular cleanout.
 - (b) The purpose of each easement shall be specified in the maintenance agreement signed by the property owner.
 - (c) Stormwater management easements are required for all areas used for off-site stormwater control unless a waiver is granted by the Permit Granting Authority.
 - (d) Easements shall be recorded by the Owner with the Middlesex South Registry of Deeds prior to issuance of a Certificate of Completion.
- (4) Changes to Operation and Maintenance Plans.
- (a) The owner(s) of the stormwater management system must notify the Permit Granting Authority of changes in ownership or assignment of financial responsibility.
 - (b) The maintenance schedule in the OMP may be amended to achieve the purposes of these rules and regulations by mutual agreement of the Permit Granting Authority and the responsible parties. Amendments must be in writing and signed by all responsible parties. Responsible parties shall include owner(s), persons with financial responsibility, and persons with operational responsibility during future years.

9.2. Stormwater infrastructure shall be privately owned, inspected, and maintained per the OMP procedures approved for the project. Inspection and maintenance logs shall be provided to the Planning Board on a yearly basis by final day in June for the Town to

use in preparation of its annual report to the US EPA as part of the NPDES MS4 Permit requirements.

- 9.3. The Applicant shall provide the PGA an annual report prepared and stamped by a licensed Professional Engineer documenting and certifying performance of required maintenance and providing an assessment of overall system performance.
- 9.4. The OMP shall include procedures for using dedicated funds, establishing an escrow account, and/or developing a maintenance contract, if determined appropriate to ensure adequate long-term maintenance.
- 9.5. Stormwater Management operation and maintenance duties shall be recorded with the deed for each lot in a subdivision. The Applicant may elect to set up a homeowner's association (HOA) or other means to ensure all BMPs are inspected and maintained as required.
- 9.6. Long-term operators responsible for OMP implementation shall submit an annual report to the Planning Board documenting all inspection and maintenance completed on the stormwater system.

10.0 Site Inspections, Supervision, and Final Reports

- 10.1. Pre-Construction Meeting. Prior to the commencement of any clearing, excavation, construction, or Disturbance of Land, the Applicant, the Applicant's licensed Professional Engineer, the general contractor, the Town's third-party expert engineer, or any other person with authority to make changes to the project, shall meet with the Permit Granting Authority or its designee to review the permitted Stormwater Management, Erosion and Sediment Control, and Operation and Maintenance Plans and their implementation.
- 10.2. Erosion and Sediment Control Inspections. The Applicant shall conduct and document inspections of all erosion and sediment control measures no less than weekly or as specified in the Stormwater Management Permit, and prior to and following anticipated storm events. The purpose of such inspections is to determine the overall effectiveness of the erosion and sediment control plan, and the need for maintenance or additional control measures. The Applicant shall submit monthly erosion and sediment control reports to the Planning Board in a format approved by the Planning Board.
- 10.3. Routine Inspections. Routine inspections shall be performed by the Applicant's licensed Professional Engineer as follows:
 - (1) Initial Site Inspection: prior to approval of any permit/plan (note, an inspection will also be completed by the Town's third-party expert engineer);
 - (2) Erosion and Sediment Control Inspection prior to the commencement of any construction activity: to ensure erosion and sediment control measures are in place and stabilized, and to ensure erosion control practices are in accordance

with the filed plan (note, an inspection will also be completed by the Town's third-party expert engineer).

- (3) Site Clearing has been substantially completed;
- (4) Rough Grading has been substantially completed;
- (5) Final Grading has been substantially completed;
- (6) Bury Inspections: prior to backfilling of any underground drainage or stormwater structures.
- (7) Close of the Construction Season;
- (8) Landscaping (permanent stabilization); and,
- (9) Final Inspection. After the stormwater management system has been constructed the Applicant must submit a record as-built plan detailing the actual stormwater management system as installed. Such plans shall show compliance with the final approved plans by the Permit Granting Authority. The Permit Granting Authority or their designee shall inspect the system to confirm its "as-built" features match those depicted on the project plans. If the inspector finds the system to be adequate, the inspector shall so report to Permit Granting Authority which will issue a Certificate of Completion.

10.4. Inspector Qualifications. Inspections shall be performed by a licensed Professional Engineer or CPESC as hired by the Applicant.

10.5. Access Permission. To the extent permitted by Massachusetts law, the Permit Granting Authority and third-party inspectors/engineers may enter upon privately-owned property for the purpose of performing their duties under these rules and regulations and may make or cause to be made such examinations, surveys, or sampling as the Permit Granting Authority deems reasonably necessary to determine compliance with the Stormwater Management Permit.

10.6. Final Reports. Upon completion of the work, the Applicant shall submit a report (including certified as-built construction plans) from the Applicant's licensed Professional Engineer. As-built drawings shall be submitted to the Permit Granting Authority prior to the Building Inspector's issuance a Certificate of Occupancy. 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 report shall certify that all permitted construction, plans, and approved changes and modifications, were completed in accordance with the conditions of the approved Stormwater Management Permit. Any discrepancies should be noted in the report.

If the system is found to be inadequate by virtue of physical evidence of operational failure, even though it was built as called for in the Stormwater Management Plan, it shall be corrected by the Applicant at no cost to the Town of Lincoln. Examples of inadequacy include but are not limited to: errors in the infiltrative capability, errors in the maximum groundwater elevation, failure to properly define or construct flow paths, or erosive discharges from basins or other structural BMPs.

11.0 Certification of Completion

Upon receipt of a final inspection report and certification by the Applicant's licensed Professional Engineer, the Permit Granting Authority will issue a Certificate of Completion determining that all work of the Stormwater Management Permit has been satisfactorily completed in conformance with these rules and regulations. The Permit Granting Authority may, in addition to certifying satisfactory completion of the project, require ongoing maintenance procedures as outlined in the OMP and/or work deemed necessary by the Permit Granting Authority.

12.0 Enforcement

12.1 Enforcement powers of the Planning Board or its designee (enforcing agent) are granted in the Article XXIX of the General Bylaws, Section 7.

12.2 Notices and Orders

- (1) The Planning Board or an authorized agent (enforcing agent) of the Planning Board may issue a written notice of violation or enforcement order to enforce the provisions of the Stormwater Management Bylaw and these Regulations, which may include but not limited to, requirements to:
 - (2) Suspend or revoke approval of any Stormwater Management Permit;
 - (3) Cease and desist from all or a portion of construction or land disturbing activity until there is compliance with the Bylaw, Regulations and the Stormwater Management Permit;
 - (4) Repair, maintain, or replace the stormwater management system or portions thereof in accordance with the Operation and Maintenance Agreement;
 - (5) Perform monitoring, analyses, and reporting; and/or
 - (6) Fix any adverse impacts resulting directly or indirectly from malfunction of the stormwater management system.
- (7) The Property owner or its designee may appeal the decision of the enforcing agent to the full Permit Granting Authority within five (5) calendar days of receipt of the written notice of violation or enforcement order. Failure to appeal within five (5) calendar days shall preclude any further appeal.
- (8) If the Stormwater Permit Authority, or its authorized agent determines that abatement or remediation of adverse impacts is required, the order shall set forth a deadline by which such abatement or remediation must be completed. Said order shall further provide that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the Town may, at its option, pursue a Court Order allowing the Town to undertake such work, and expenses thereof shall be charged to the violator.

- i. If the Permit Granting Authority takes action upon failure of the violator or owner to abate or remediate, notice shall be given to the violator and owner of the costs, including administrative costs, incurred by the Town. Said notice shall be sent within thirty (30) days of completion of all measures necessary to abate the violation or to perform remediation. The violator or owner shall also be notified that they may, within thirty (30) days of receipt of said notice, file an appeal in writing to the Select Board objecting to either the amount or basis of the costs incurred. If the amount due is not received by the expiration of the time in which to file an appeal or within (30) days following a decision by the Select Board affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the costs shall become final and payable to the Town.

(9) The suspension or revocation of the Stormwater Management Permit shall not relieve the Applicant of its obligations thereunder except at the discretion of the Board as stated in writing.

(10) Any Person who purchases, inherits or otherwise acquires real estate upon which work has been done in violation of the provisions of the Stormwater Management Bylaw and these Regulations, or in violation of the approved Plans under these Regulations shall forthwith comply with any such Order, and restore such real estate to its condition prior to such violation, as the Planning Board deems necessary to remedy such violation.

(11) Non-Criminal Disposition. As an alternative to criminal prosecution or civil action, the Planning Board or its designee may elect to utilize the non-criminal disposition procedure set forth in G.L. Ch. 40, §21D and the Town's Bylaws in which case the Planning Board or its designee shall be the enforcing entity. The penalty for the 1st violation shall be \$100.00. The penalty for the 2nd and all subsequent violations shall be \$300.00. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.

Remedies Not Exclusive. The remedies listed in these Regulations are not exclusive of any other remedies available under any applicable federal, state, or local law.

End of Document

Appendix C

Stormwater System Mapping

Mapping Status

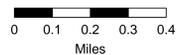
| Requirement Summary | Status |
|--|------------------------------|
| Phase I – Must be Complete by July 1, 2020 | |
| 1. Outfalls and receiving waters | Complete |
| 2. Open channel conveyances | Substantially complete |
| 3. Interconnections with other MS4s | In progress, updates ongoing |
| 4. Municipally owned structural BMPs | Complete |
| 5. Waterbody names and impairments | Complete |
| 6. Initial catchment delineations by topography | Complete |
| Phase II – Must be Complete by July 1, 2028 | |
| 1. Outfalls with spatial accuracy +/-30 feet | Complete |
| 2. Pipe connectivity | Substantially complete |
| 3. Manholes | Complete |
| 4. Catch basins | Complete |
| 5. Refined catchment delineations | Complete |
| 6. Municipal sanitary system | Not applicable |
| 7. Municipal combined sewer system | Not applicable |



Legend

- | | |
|--------------------|-------------------------|
| ▲ Outfalls | ○ State Manhole |
| ▲ Private Outfalls | □ State Catch Basin |
| ■ Catch Basin | — Town Drainage Pipe |
| ● Drain Manhole | — State Drainage Pipe |
| ■ Inlet | — Roads |
| ■ Building Drain | — Lake, Pond, Reservoir |
| ■ Interconnection | — Wetland, Marsh, Swamp |
| ■ BMPs | — Stream, Brook |

**Stormwater Infrastructure Map
Lincoln, MA**



Comprehensive
Environmental
Incorporated



Data Sources: CEI, MassGIS, Town of Lincoln

Appendix D

Regulatory Assessments



LID, GI, AND IA REGULATORY ASSESSMENT

To: Tim Higgins, Town Administrator, Town of Lincoln
From: Nick Cristofori, P.E., Comprehensive Environmental Inc
Date: May 27, 2022
Subject: Review of Lincoln's Regulations for LID, GI, and Impervious Creation

Under the Environmental Protection Agency's (EPA's) 2016 National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit, regulated communities such as Lincoln are required to complete an assessment of existing town regulations as they pertain to Low Impact Development (LID), green infrastructures (GI), and the creation of impervious (IA) area under permit sections 2.3.6.b and 2.3.6.c. In summary, communities must complete the following:

- Develop and report assessing current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover to determine if changes to design standards for streets and parking lots can be made to support low impact development options.
- 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: green roofs; infiltration practices such as rain garden, planter garden, pervious pavements, and other designs to manage stormwater using landscaping and structured soils; and water harvesting devices such as rain barrels, and cisterns.

This memorandum serves as a report assessing any barriers to implementing LID and green infrastructure, opportunities for reducing mandatory creation of impervious area, and recommended regulatory changes to be made.

As part of preparation for this memo, CEI reviewed the following regulations:

- General By-Laws (May, 15, 2021)
- Zoning By-Laws (May, 15, 2021)
- Subdivision Rules and Regulations (undated)
- Wetlands Protection Bylaw (June, 25, 2007)
- Buffer Zone Regulations (March 8, 2017)

Recommendations

The following items are provided as recommendations and next steps:

- Table 1 (attached) provides a detailed assessment and recommended regulatory changes that should be considered when updating relevant sections of the town's regulatory mechanism.
- Regulatory review and permitting processes such as Site Plan Review, Subdivision, Wetlands, and/or any other similar processes should be updated to specifically reference



LID, GI, AND IA REGULATORY ASSESSMENT

the stormwater regulatory mechanisms adopted to meet MS4 regulations for projects that disturb one or more acres. This should include the construction and post-construction stormwater requirements, including requirements for treating stormwater from new development and redevelopment, so that project proponents are aware of the additional requirements under MS4 regulations.

- Changes should be made as part of the next major regulatory update undertaken by the town for each relevant section, or more suitable timeframe as determined by the Planning Board, if applicable, as recommended by the permit.
- This memorandum should be provided to the Planning Board and local transportation board, if applicable, as recommended by the permit.

If you have any further questions or would like additional information, please feel free to contact me at 800.725.2550 x303 or ncristofori@ceiengineers.com. Thank you.

Nick Cristofori, P.E.
Principal, Project Manager

Attachments:

- Table 1: Recommendations for Updating Existing Regulations Pertaining to LID, Green Infrastructure and Impervious Cover Creation



LID, GI, AND IA REGULATORY ASSESSMENT

Table 1: Recommendations for Updating Existing Regulations Pertaining to LID, Green Infrastructure and Impervious Cover Creation

| Topic | Reference | Existing Requirement | Recommendations |
|--|---|---|--|
| General design for environmental sensitivity | <u>Zoning</u> Article 1: Purposes | Provides for general protection of natural features | Consider expanding this section to include: <ul style="list-style-type: none"> • Precautions to prevent pollution from stormwater runoff; • Minimization of cuts and fills; • Minimization of disturbances of steep slopes. |
| | <u>Zoning</u> Article 1: Purposes | Provides for the general welfare and safety of inhabitants by regulating size of buildings and structures, location and use of buildings, structures, and land, size and width of lots, etc. | |
| Stormwater Management | | | |
| Drainage system design | <u>Subdivision</u> Section 7.7 Storm Drainage | Requires installation of storm drains, culverts, subdrains, ditches including catch basins, gutters and manholes as necessary to provide adequate disposal of surface and sub-surface water, including control of erosion, flooding, and standing water. | Reconcile design criteria. Consider increasing the storm design to accommodate for climate change. |
| | <u>Subdivision</u> Section 17.4 Site Plan Approval Standards and Criteria | Current requirements permit the use of stormwater Best Management Practices (BMPs) (vegetated swales, grass-lined retention basins, detention ponds, etc.) in addition to standard piped drainage systems with catch basins and manholes to provide adequate drainage of all portions of the street system. | |
| | <u>Subdivision</u> Section 7.7 Storm Drainage 7.7.4 Catch Basins and Manholes | Requires catch basins be located on both sides of the roadway at intervals of not more than 300 feet at all low points and all intersections. | Consider modifying this requirement to allow/ encourage surface runoff to flow towards a stormwater BMP. |



LID, GI, AND IA REGULATORY ASSESSMENT

| Topic | Reference | Existing Requirement | Recommendations |
|---|---|--|---|
| Open Space | | | |
| Open space residential development (OSRD) | <u>Subdivision</u> Section 17.4: Site Plan Approval Standards and Criteria | Requires all open space be designed to add to the visual amenities of the neighborhood by maximizing its visibility for persons passing the site or overlooking it from nearby properties. | Consider explicitly allowing LID stormwater management practices (bioretention areas, filter strips, swales, rain gardens, constructed wetlands, etc.) in common open space areas. |
| Site design | <u>Zoning</u> Article 8: Open Space Residential Development District | No current requirements to explicitly require LID design techniques for OSRD site plan and supporting stormwater management features. | Consider requiring open spaces to be designed as LID and addressing the following site design strategies: <ul style="list-style-type: none"> • Minimizing pavement, retaining natural drainage paths and features, and treating runoff as close to its source as feasible; • Directing runoff from roofs and pavements into natural or planted areas to “disconnect” runoff from the formal drainage system; • Maximizing the use of infiltration practices to reduce runoff volume that must otherwise be conveyed and treated; • Use of surface-based stormwater management systems (rather than subsurface systems) that incorporate vegetation to enhance stormwater treatment • Encourage reuse of stormwater onsite. |



LID, GI, AND IA REGULATORY ASSESSMENT

| Topic | Reference | Existing Requirement | Recommendations |
|------------------------|--|---|--|
| Setbacks and frontages | <u>Zoning</u> Article 6: Development Regulations-Standard Development | Provides bulk regulations for minimum lot frontage and yard setbacks. Min. lot frontage: 20 feet Min. street frontage: 120 feet Min. side/rear yard setback residential: 50 feet Min. side/rear yard setback non-residential: 75 feet | Consider allowing further reduction in frontage (and corresponding road length/paved area). |
| Cluster Development | = | No regulations currently exist on cluster development. | Consider allowing flexible development such as cluster/open space development as a “by right” form of development (no special permit required) and developing guidance that requires cluster development sites to be designed as LID with guidance regarding what is meant by LID: <ul style="list-style-type: none"> • Site design strategy for minimizing pavement, retaining natural drainage paths and features, and treating runoff as close to its source as feasible; • Directing runoff from roofs and impervious areas to “disconnect” runoff from the formal drainage system; • Maximizing the use of infiltration practices to reduce runoff volume that must otherwise be conveyed and treated; |



LID, GI, AND IA REGULATORY ASSESSMENT

| Topic | Reference | Existing Requirement | Recommendations |
|----------------------|---|---|--|
| | | | <ul style="list-style-type: none"> Use of surface-based stormwater management systems that incorporate vegetation to enhance stormwater treatment. |
| Street Design | | | |
| Materials | <u>Subdivision</u> Article 7: Required improvements 7.5.4 Gravel Foundation | Requires gravel for roadways, sidewalks, and off-street patch construction shall consist of inert material that is hard, durable stone and coarse sand, free loam and clay, surface coating, and deleterious materials. | Consider the use of permeable materials such as porous pavers, paving stones, and pervious pavement for road shoulders and parking lanes in residential neighborhoods with the use of conventional paving for travel lanes only. |
| | <u>Subdivision</u> Article 7: Required improvements 7.5.5 Shoulders | Requires shoulders five feet in width be constructed of gravel covered with six inches of loam and brought to a finished grade flush with or slightly above the adjacent pavement or curbing. | |
| Curbs and berms | <u>Subdivision</u> Section 7: Required Improvements 7.5.9 Curbing | Where grades are in excess of 2% or where such protection is deemed necessary by the Board, curbing constructed of granite or bituminous concrete and sealed to the road pavement shall be constructed | Consider allowing the use of “open drainage” along residential streets. If protection of the roadway edge is a concern, consider allowing alternative designs such as curbs with openings (or “leak-offs”) or flush curbs, that enable the use of bioretention, treatment swales, and open drainage instead of piped drainage. |



LID, GI, AND IA REGULATORY ASSESSMENT

| Topic | Reference | Existing Requirement | Recommendations |
|--------------------|---|---|---|
| Right-of-Way (ROW) | <u>Subdivision</u> Section 6: Design Standards 6.2.3 Right of Way Widths | Requires the minimum width of street rights of way be sixty (60) feet for principal streets, fifty (50) feet for secondary streets, and forty (40) feet for minor streets. Greater width shall be required by the Board deemed necessary for present and future vehicular travel. | Consider allowing for flexibility of ROW widths. Wherever possible, residential ROW widths should reflect the minimum required to accommodate the travel-way, the sidewalk, and vegetated open channels. |
| Street layout | <u>Subdivision</u> Section 6: Design Standards 6.2.2.6 Intersections | Recommends streets shall be laid out to intersect as nearly as possible at right angles. Suggests particular attention be paid to sight lines, interfering plantings, walls, fences, etc. and to blinding headlights, etc. | LID practices recommend street layout considerations include reducing street length and minimizing total paved area (including cul-de-sacs) with the goal of protecting site hydrology, reducing cut and fill, and protecting steep slopes/ important natural features. |
| Dead-end streets | <u>Subdivision</u> Section 6: Design standards 6.2.2.8 Dead Ends Length | States dead-end streets shall not be longer than five hundred (500) feet. The minimum length shall not be less than the minimum lot frontage in the zoning district. | Consider minimizing the required paved diameter of cul-de-sacs to 70 feet as encouraged in LID practices and allowing alternative pavement types such as pervious pavement. |
| | <u>Subdivision</u> Section 7: Required Improvements 7.5.8 Surface Treatment | Requires the paved surface on dead-end turnarounds have an outside radius of sixty feet and an inside radius of thirty-five feet. | |
| Landscaping | <u>Subdivision</u> Section 7: Required Improvements 7.5.8 Surface Treatment | Requires planting or other landscaping be provided in sufficient quantity and scale to indicate the location and boundary of the center island in the turnaround. | Consider allowing the use of vegetated stormwater management practices (bioretention areas, filter strips, swales, rain gardens, constructed wetlands, etc.) within the center of turnarounds. |



LID, GI, AND IA REGULATORY ASSESSMENT

| Topic | Reference | Existing Requirement | Recommendations |
|------------------------------|--|---|--|
| Sidewalks | | | |
| General requirements | <u>Subdivision</u> Section 7: Required Improvements 7.5.7 Sidewalks and off-street paths | Requires sidewalks be provided on one side of the principal and secondary streets. The board may require sidewalks on both sides of the street. | No changes recommended. Current provisions provide flexibility in sidewalk layout and allows for sidewalks only where there is a need for them, which is desirable for promoting low impact design. |
| Width | <u>Subdivision</u> Section 7: Required Improvements 7.5.7 Sidewalks and off-street paths | Requires sidewalks be five to eight feet wide and shall be located outside of the road shoulders. | Consider lowering requirement to a minimum sidewalk width of 4 feet and establishing a maximum width. |
| Materials | <u>Subdivision</u> Section 7: Required Improvements 7.5.7 Sidewalks and off-street paths | Requires sidewalks be constructed of a twelve (12) inch layer of clean gravel containing no large stones, paved with three (3) inches or more of bituminous concrete. Where sidewalks are located at an embankment, a level area at least two feet in width shall be provided between the sidewalk and/or off-street patch or embankment. | Consider allowing or requiring the use of permeable surfaces for sidewalks. |
| Parking Lots | | | |
| Reduced parking requirements | <u>Zoning</u> Section 15.3 Regulations and Restrictions 15.3.2.1 Off-street Parking | Off-street parking is required in at least the ratio below for the following uses of land and buildings: a) Dwellings: one space per dwelling unit b) Places of public assembly: one space per three seats | Consider establishing parking maximums and adjusting current minimum requirements to meet the following LID recommendations: <ul style="list-style-type: none"> Do not require more than 3 off-street parking spaces per 1000 SF of gross floor area in professional office buildings; |



LID, GI, AND IA REGULATORY ASSESSMENT

| Topic | Reference | Existing Requirement | Recommendations |
|-----------------|--|--|---|
| | | <p>c) Schools: one space per each classroom, plus one space for each two employees, in addition to the above, where an auditorium is provided, one space for each three seats</p> <p>d) Hotels, motels, lodging houses: one space per each room and loading spaces for all delivery trucks or sanitary collection vehicles</p> <p>e) Other services establishments and retail businesses: at least one space for each 250 square feet, excluding basement storage areas</p> <p>f) Wholesale and light establishments: one space per employee on the largest shift plus one space for each company owned/operated vehicle</p> | <ul style="list-style-type: none"> • Do not require more than 4 off-street parking spaces per 1000 SF of gross floor area of shopping centers; • Do not require more than 2 off-street parking spaces per single family home. |
| Drainage design | <p><u>Zoning</u> Chapter 15.3 Regulations and Restrictions 15.3.3.2 Construction</p> | <p>Requires parking spaces, maneuvering aisles and driveways to have a durable, dustless, all-weather surface, and shall provide for a satisfactory disposal of surface water by grading and drainage in such a manner that no surface water shall drain onto any public way or onto any lot in other ownership and such surfaces shall be well maintained.</p> | <p>Consider expanding to explicitly allow/encourage drainage be designed so runoff flows towards a stormwater BMP.</p> |



LID, GI, AND IA REGULATORY ASSESSMENT

| Topic | Reference | Existing Requirement | Recommendations |
|------------------|--|--|---|
| Landscaping | <u>Zoning</u> Chapter 15.3 Regulations and Restrictions 15.3.3.3 Landscaping | Requires parking areas containing more than 15 parking spaces shall be landscaped and screened from adjacent property. Such landscaping shall be designed to provide relief from glare and reflection and to reduce the visual impact of parking areas on adjacent property by the use of trees, shrubs, walls, fences, or other landscape elements. | Consider specifying dimensions for landscaped areas that are sufficient to plant large, mature trees (e.g., minimum width 6 feet or greater) which will create shade over the lot. |
| Driveways | | | |
| Width | <u>Zoning</u> Chapter 15.3 Regulations and Restrictions 15.3.3.1 Design | Requires the width of a driveway for one-way traffic shall be not less than 12 feet as measured at its narrowest point. The width of a driveway for two-way use shall be a minimum of 18 feet as measured at its narrowest point and a maximum of 24 feet. | Consider specifying the width based on whether it is a 1-way or 2-way driveway. Note that Massachusetts LID toolkit recommends a minimum driveway width of 9 feet for 1-way and 18 feet for 2-way |
| | <u>Zoning</u> Chapter 15.3 Regulations and Restrictions 15.3.3.1 Design | Establishes a maximum of two driveways per street line. Driveways shall be located as to minimize conflict with traffic on public streets. | |



LID, GI, AND IA REGULATORY ASSESSMENT

| Topic | Reference | Existing Requirement | Recommendations |
|-------------------|--|---|--|
| Materials | <u>Zoning</u> 15.3 Regulations and Restrictions 15.3.3.2 Construction | Requires driveways have a durable, dustless, all-weather surface, and shall provide for the satisfactory disposal of surface water by grading and drainage in such a manner that no surface water shall drain onto any public way or onto any lot in other ownership and such surfaces shall be well maintained | Consider allowing permeable materials, such as porous pavers and pervious pavement, for driveways. Also consider allowing the use of “two-track” driveways (driveways only paved for the width of each wheel track) for residential driveways. |
| Lot Layout | | | |
| Site Design | <u>Zoning</u> Article 6: R-1 Single family residence district Section 6.5: R-1 Development regulations-standard development Section 7: R-2 General residence district Section 8: The R-3 and the R-4 districts | Provides tables of bulk regulations including minimum lot area, lot frontage, and lot width. | Consider establishing limits on the extent of lawn area in residential lots, either by area or percentage of lot. Encourage property owners to plant native, drought-resistant species on lawn areas which require less water, pesticides, and fertilizers. |
| Utilities | <u>Subdivision</u> Section 6: Design Standards 6.3.1 Utility Easements | Easements for utilities across lots or centered on rear or side lot lines shall be provided where necessary and shall be at least twenty feet wide. Additionally, a work easement of ten feet will be provided on each side of the utility easement. | Consider allowing the placement of utilities on all roads under the paved section of the ROW, or immediately adjacent to the road edge such as in cross sections for secondary and minor roads, so that the land adjacent to the roadway can be used for swales. |



LID, GI, AND IA REGULATORY ASSESSMENT

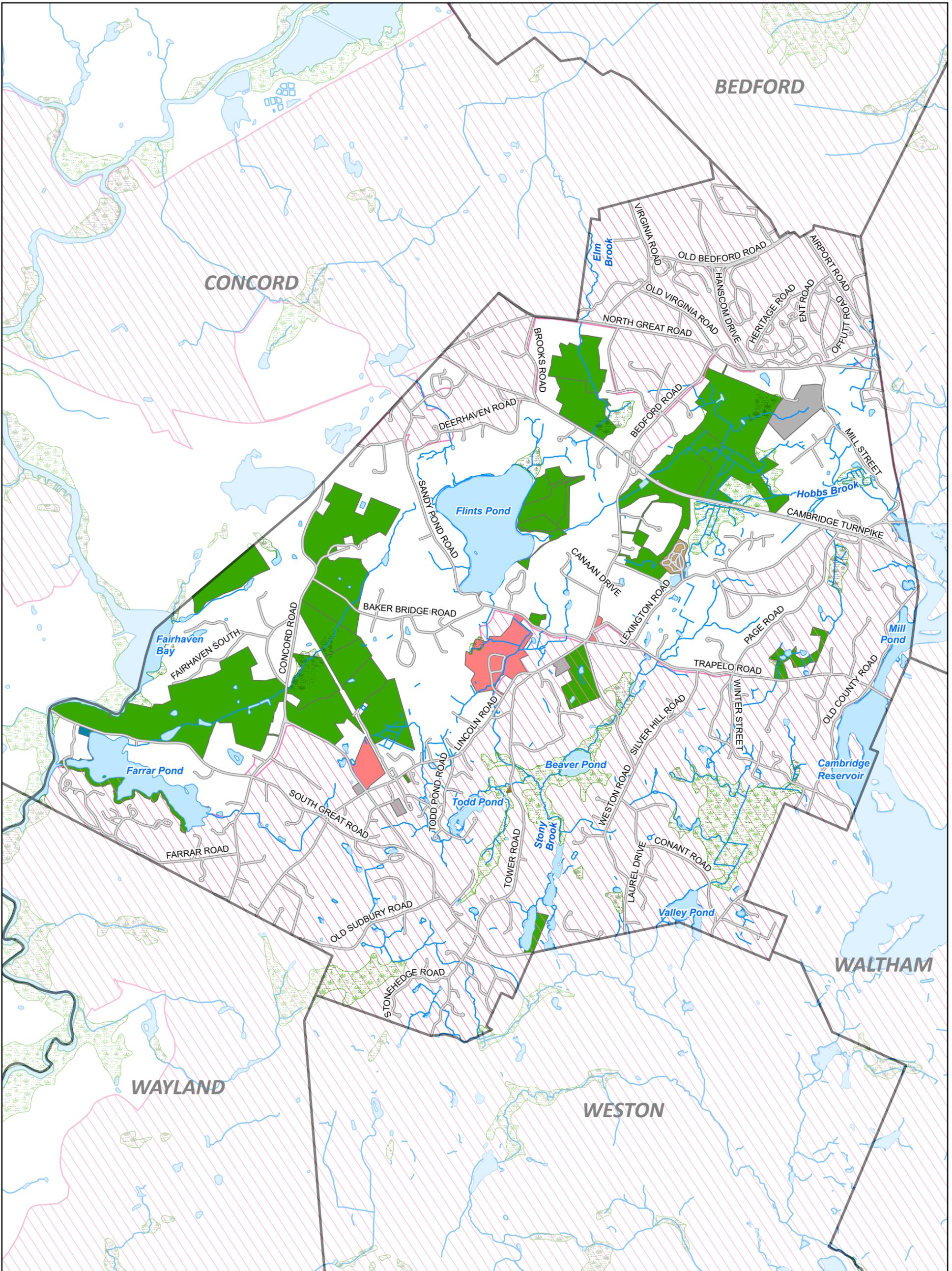
| Topic | Reference | Existing Requirement | Recommendations |
|--------------|--|--|--|
| Buffer areas | <u>Bylaws</u> Ch. 237: Wetlands Protection 237-2. Jurisdiction | Prohibits removing, filling, dredging, or altering in or within 100 feet of wetland resource areas except as permitted by the Conservation Commission or as provided in 237-3. Exceptions, which include altering existing structures or emergency projects. | Consider allowing the use of low impact stormwater structures (bioretention areas, infiltration trenches, or grass swales) within the buffer zone of wetland resource areas, provided the location of these structures is not in conflict with any other setback criteria required by Massachusetts Wetland Protection Act regulations or the MA Stormwater Management Policy Handbooks. |

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Appendix E

Inventory and Ranking of Town-Owned Property

| Site Name | Address | Responsible Department | Notes | General | | | Parks & Open Space | | | | | Buildings, Facilities, & Storage Yards | | | | | | | Vehicles and Equipment | | | Infrastructure and Maintenance | | | | | Comments | | | |
|---|--|------------------------|-------|---|---|---|-----------------------------------|---------------------------------------|---|---|---------------------------|--|--------------------------------------|-----------------------------|---|-------------------------|-------------------------|---|---|--|---|--|--|-------------------------------|--|---|----------|---|--|-------------------------|
| | | | | Is property owned by the Town but under lease agreement with a private/non-profit entity? | Custodial maintenance services provided by the Town of Lincoln? | Grounds maintenance services provided by the Town of Lincoln? | Cut & dispose of grass clippings? | Collection & disposal of leaf litter? | Use, store or dispose of pesticides, herbicides, and fertilizers? | Exterior trash cans available for public? | Dogs allowed on property? | Do waterfowl congregate here? | Is there a building on the property? | Exterior dumpsters at site? | Are petroleum products or other products used, stored or disposed of? | Is salt stored on-site? | Is sand stored on-site? | Are there any floor drains located in the building? | Does the facility have a Spill Prevention Control and Countermeasures Plan (SPCC) Plan? | Does the facility have a Stormwater Pollution Prevention Plan (SWPPP)? | Any existing written Standard Operating Procedures (SOPs) or O&M Manuals? | Are vehicles and/or equipment stored outdoors? | Are vehicles and/or equipment washed outdoors? | Is fueling performed on-site? | Are there any catch basin on the property? | Do any of the catch basins have an oil/water separator? | | Are there any outfalls on the property? | Does the property have paved surfaces? | Is snow stored on-site? |
| MUNICIPAL BUILDINGS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lincoln Town Recreation Department | 1-8 Ballfield Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lincoln Town Highway Department | 30 Lewis Street | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lincoln Town Offices | 16 Lincoln Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lincoln Fire Department | 169 Lincoln Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lincoln Transfer Station | 169 North Great Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lincoln Water Department | 77 Sandy Pond Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| SCHOOLS AND COMMUNITY BUILDINGS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lincoln Extended Day Program daycare center | 1-8 Ballfield Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Magic Garden Preschool | 1-8 Ballfield Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brooks School | 1-8 Ballfield Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Smith School | 1-8 Ballfield Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lincoln School District Administration | 1-8 Ballfield Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lincoln Council on Aging at Bemis Hall | 15 Bedford Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lincoln Public Library | 3 Bedford Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Codman Community Farms | 58 Codman Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| HOUSING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tower Road | 75 Tower Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| OPEN SPACES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Parks | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Codman Pool | 1-8 Ballfield Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Codman Field | 35-37 Sandy Pond Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Codman Community Farms | 58 Codman Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Station Park | 144 Lincoln Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mount Misery Park | 49 South Great Road (Route 117) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Twin Pond Lincoln Conservation Land | 398 - 386 Route 117 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pierce Park | 17 Weston Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tanner's Brook Trail | Off of Cambridge Turnpike across from Orchard Lane | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flint's Pond Trail | Sand Pond Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Baker Bridge Fields | Baker Bridge Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ricci Farm | Oxford Lane | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Farrar Pond Trail | 25 South Great Road (Route 117) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wheeler Farm | Bedford Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Codman Land Trails | Codman Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Osborne Farm | Page Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pine Hill Trail | Sandy Point Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adams Woods | Route 117 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cemeteries | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lincoln Cemetery | 100 Lexington Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Town Hill Cemetery | 7 Old Lexington Road | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Boat Ramps/Water Access | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sudbury River Canoe Landing | 25 South Great Road (Route 117) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Other | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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Municipal Properties:

- Boat Ramps/Ways to Water
- Cemeteries
- Low-Income Housing
- Municipal Buildings
- Open Spaces and Recreational Areas
- Schools and Community Buildings

- Town Boundaries
- Lake, Pond, Reservoir
- Wetland, Marsh, Swamp
- Stream, Brook
- Urbanized Area



Municipal Properties

Lincoln, MA



Data Sources: MassGIS, Town of Lincoln, CEI



MUNICIPAL PROPERTY BMP RETROFITS

To: Tim Higgins, Town Administrator, Town of Lincoln

From: Nick Cristofori, P.E., Comprehensive Environmental Inc.

Date: June 30, 2022

Subject: Municipal Property BMP Retrofits

Permit Requirements and Project Background

Under the Environmental Protection Agency's (EPA's) 2016 National Pollutant Discharge and Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit, as amended (Permit), the Town of Lincoln is required to complete an inventory and priority ranking of Town-owned properties (minimum of five properties) and existing stormwater infrastructure that could be retrofitted with stormwater Best Management Practices (BMPs) designed to reduce the frequency, volume and pollutant loads of stormwater discharges to its MS4 through the mitigation of impervious area. At a minimum, Lincoln must consider municipal property with significant impervious area that could be mitigated, existing street right-of-ways, and open space and undeveloped land available to mitigate stormwater runoff from nearby areas (e.g. from a trunk line in the street).

The potential for retrofitting particular properties must consider, on a screening level and subject to availability, factors such as maintenance access; subsurface geology; depth to water table; site slope and elevation; and proximity to aquifers and subsurface infrastructure including sanitary sewers and septic systems. Sites must be priority ranked based on factors such as schedules for planned capital improvements to storm and sanitary sewer infrastructure and paving projects as available; current storm sewer level of service (if known); control of discharges to impaired or critical receiving waters; the complexity and cost of implementation; and opportunities for public use and education.

Additionally, the Town has a waterbody listed under the final Massachusetts Year 2016 List of Impaired Waters (2016 303d List¹) as being subject to Total Maximum Daily Load (TMDL) requirements. Specifically, the Charles River has an approved TMDL for phosphorus, and Lincoln is required to develop a priority ranking for implementation of phosphorus control practices based on the factors outlined previously as part of a comprehensive Phosphorus Control Plan (PCP). Structural BMPs must then be designed and constructed to meet pollutant reduction requirements specified under the TMDL by the end of June 2033 (Permit Year 15).

Beginning with the fifth year MS4 annual report and in each subsequent annual report, Lincoln must report on those permittee-owned properties and infrastructure inventoried that have been retrofitted with BMPs to mitigate impervious area and associated water quality impacts. A minimum of five sites must be maintained in the retrofit inventory.

¹ As of the date of this memorandum, the finalized 2016 303d List is the most recent List of Impaired Waters available.



MUNICIPAL PROPERTY BMP RETROFITS

This memorandum outlines activities completed by Comprehensive Environmental Inc. (CEI) to assist the Town of Lincoln with meeting the above Permit requirements, with a focus on potential retrofit opportunities on developed municipal parcels. Analysis of open space and undeveloped land available to mitigate stormwater runoff from nearby areas should be evaluated under a future effort.

Municipal Parcel Retrofits

Desktop and Field Analysis

CEI identified eleven Town-owned facilities located within the MS4 regulated area with impervious cover such as parking lots and rooftops as required by the permit which were advanced for additional desktop and field analysis. CEI first developed a series of parcel maps for each facility to be used for recording existing conditions and field notes. Parcel maps typically showed an aerial view of each facility, along with property lines, topography data, available drainage information, and other relevant information. Nick Shaw of CEI conducted field assessments of all eleven facilities in fall 2021. The goal was to evaluate opportunities to reduce pollutant loads discharging to the MS4 or surface water bodies from the site through reduction or treatment of stormwater runoff from impervious surfaces. A map of all eleven facilities is provided as **Figure 1** at the end of this memorandum. A summary of the existing conditions for each site is included as **Table 1**, with proposed retrofit conditions provided as **Table 2** the end of this memorandum.

Proposed BMP Selection

Proposed conceptual BMPs have been selected based largely on available space, soil types within the area, and proximity to wetland areas. For planning, pollutant removal, and cost estimating purposes, locations with larger areas available for implementation were assigned BMPs with larger footprints such as infiltration basins, extended detention basins, or constructed wetlands, whereas smaller areas were assigned to rain gardens, trenches, or swales. Implementation areas with soils classified primarily as HSG C or D were assigned non-infiltrating BMP types such as extended detention basins. Areas located in close proximity to wetlands are assumed to have relatively high groundwater, and thus were assigned BMP types such as constructed wetlands.

For the purposes of this initial screening effort, BMP selection focused on surface BMPs that could be installed in existing available spaces with little disturbance to existing paved surfaces, as a typical surface BMP is less expensive on a pounds of pollutant removed than a subsurface system installed below a parking lot or ball field. More expensive underground infiltration BMPs (e.g., subsurface infiltration) will be considered for proposed redevelopment projects where demolition, reconstruction and/or repaving are proposed to minimize the costs of installation. The use of subsurface infiltration BMPs would significantly increase treatment costs, as they can cost up to 4-10 times more than surface BMPs. Other BMPs that disturb pavement, including leaching catch basins and porous pavement, can likely be implemented at a wide variety of site, however, were not comprehensively assessed as part of this project will also be evaluated during redevelopment projects. Actual BMP types and sizes are expected to be refined as part of future designs.



MUNICIPAL PROPERTY BMP RETROFITS

BMP Unit Cost

Costs for BMP design and construction were estimated based on a memorandum from EPA titled “Methodology for developing cost estimates for Opti-Tool” (**Attachment A**). This memorandum built on multiple previous studies dating as far back as 2010 to estimate total implementation costs for multiple types of stormwater BMPs on a dollars per cubic foot of constructed volume in 2016 dollars, which also assumed that 35% of the construction cost would go towards engineering design and other contingencies. For the purposes of this memorandum, 2016 dollars were then converted to 2022 dollars by adding 18% to the total cost in order to account for inflation over the preceding six years. Additionally, the Opti-Tool memorandum notes that cost adjustment factors may be incorporated to more accurately account for BMP site constraints associated with installation in urban environments as follows:

- Undeveloped areas: 1.0;
- Partially developed areas: 1.5;
- Developed areas: 2.0; and
- Highly urban setting: 3.0.

Based on current development conditions, a cost adjustment factor of 1.5 was applied to all potential BMPs. Actual engineering costs depend on many factors, and engineering for larger projects generally consist of a lower total percent of the construction cost, with the inverse being true for smaller projects (e.g., a \$250,000 construction project may have a \$50,000 engineering cost or 20% of construction, whereas a \$50,000 construction project may have a \$25,000 engineering cost or 50% of construction). Costs outlined in this memorandum are for guidance and comparison purposes only, and future design phases will further refine costs associated with all BMPs. A summary of costing data is provided in **Table 3** at the end of this memorandum.

Pollutant Removal and Cost Summary

Based on calculations from the BATT calculator, implementation of the top five stormwater BMPs outlined in Table 2 will remove a total of 4.7 pounds of phosphorus for a total engineering and construction cost of approximately \$368,300 at an average cost of \$78,200 per pound of phosphorus removed. Pre-conceptual designs for the top five sites have been prepared and are included as **Attachment B**.

Roadway Improvement Projects

Roadway improvement projects such as pavement resurfacing, reclamation, and/or roadway widening serve as an opportunity for the Town to coordinate drainage improvements with roadway improvements. It also provides an opportunity to incorporate water quality BMPs, however, such opportunities are often restricted to areas located within, or immediately adjacent to, the roadway. Example roadway intersection improvements for Town to consideration are provided in **Attachment C**, however, other alternative designs may also be considered depending on site-specific conditions. Implementation of such BMPs requires evaluation on a case-by-case basis in



MUNICIPAL PROPERTY BMP RETROFITS

consideration of the size of the ROW, soil type, surrounding drainage infrastructure and location of other utilities.

Recommendations and Next Steps

It is recommended that the Town begin to move forward with design of BMPs outlined in **Table 4** below in order to meet PCP requirements. As noted above, these locations were identified to be of high priority as they have good opportunities for retrofit, discharge to waterbodies with a phosphorus TMDL, and have good public education opportunities. Pre-conceptual designs for each of these sites have been prepared and are included as **Attachment B**. The Town should also consider investigating, and implementing where feasible, water quality treatment BMPs as part of drainage improvements during roadway improvement projects. The cost and amount of phosphorus removed from these systems will vary based on BMP size and contributing area.

Table 4 – Top Ranked BMP Locations

| Location | | Proposed BMP(s) | | Estimate Costs | TP Reduction | |
|------------------------------------|--------------------|-----------------------|---|----------------------------|--------------|-----------------|
| Facility Name | Address | Type | Estimated Size | Construction & Engineering | Lbs / Year | Dollars / Pound |
| Pierce Park | 17 Weston Road | Catch Basins | 2 Units | \$15,400 | 1.0 | \$58,200 |
| | | Infiltration Basin | 40' x 30' x 3' Deep | \$39,900 | | |
| Codman Community Farms | 58 Codman Road | Leaching Catch Basins | 3 Units | \$23,100 | 0.7 | \$158,300 |
| | | Swales | 120' x 8' x 1' Deep (2) 40' x 8' x 1' Deep | \$24,900 | | |
| | | Rain Garden | 40' x 25' x 2' Deep | \$54,900 | | |
| Fire Department and Police Station | 169 Lincoln Road | Catch Basins | 4 Units | \$30,800 | 0.3 | \$450,000 |
| | | Infiltration Trenches | 100' x 4' x 2' Deep 90' x 3' x 2' Deep | \$29,700 | | |
| | | Rain Garden | 30' x 15' x 2' Deep | \$24,800 | | |
| | | Detention Basin | 50' x 20' x 3' deep | \$36,200 | | |
| Department of Public Works | 30 Lewis Street | Sediment Separator | 1 Unit | \$34,700 | N/A | N/A |
| Conservation Land | 21-35 Trapelo Road | Infiltration Basin | 65' x 25' x 3' Deep | \$53,900 | 2.8 | \$19,000 |



MUNICIPAL PROPERTY BMP RETROFITS

If you have any further questions or would like additional information, please feel free to contact me at 800.725.2550 x303 or ncristofori@ceiengineers.com. Thank you.

Nick Cristofori, P.E., Project Manager

Attachments:

- Table 1: Summary of Existing Conditions
- Table 2: Proposed Improvements
- Table 3: BMP Costing Information
- Figure 1: Municipal Properties visited
- Attachment A: Memorandum report on Methodology for developing cost estimates for Opti-Tool; February 20, 2016
- Attachment B: Pre-Conceptual Designs for Top Locations
- Attachment C: Example Roadway and Intersection BMP Improvements

Table 1 - Summary of Existing Conditions

| Description | Address | CEI Map ID | Total Parcel Area (acres) | Impervious Area (acres) | Existing Conditions Description | Watershed | Direct or Near-Direct Discharge | BMPs Present? | Soils | | |
|--|--------------------|------------|---------------------------|-------------------------|---|-------------------------------|---------------------------------|-----------------------|--|-------------------|-------------------|
| | | | | | | | | | Soil Type | Hydric Soil Group | Soil Area (acres) |
| Pierce Park | 17 Weston Rd | P5 | 30.91 | 0.75 | The site consists of open wooded conservation/park land with no existing drainage. There is some minor impervious area in the form of a building, driveways and parking lots. There is also 1 detention pond and 1 detention basin within the parcel. Existing drainage from Lincoln Road to the north outfalls into the pond. | Charles River | Yes | Yes (Detention Basin) | Hinckley loamy sand | A | 0.37 |
| | | | | | | | | | Narragansett silt loam | A | 12.29 |
| | | | | | | | | | Wareham loamy fine sand | A/D | 14.75 |
| | | | | | | | | | Canton fine sandy loam | B | 3.50 |
| Codman Community Farms | 58 Codman Rd | S4 | 19.10 | 1.38 | The site comprises of community gardens and farm land with no existing catch basins or drainage as most of the land is pervious. | Charles River | No | No | Canton-Charlton-Urban land complex | A | 0.59 |
| | | | | | | | | | Merrimac fine sandy loam | A | 3.07 |
| | | | | | | | | | Canton fine sandy loam | B | 5.35 |
| | | | | | | | | | Freetown muck, ponded | B/D | 2.61 |
| | | | | | | | | | Swansea muck | B/D | 2.82 |
| | | | | | | | | | Paxton fine sandy loam, extremely stony | C | 3.46 |
| Scituate fine sandy loam, extremely stony | D | 1.22 | | | | | | | | | |
| Lincoln Fire Department and Police Station | 169 Lincoln Rd | FD1 | 1.90 | 1.12 | This site consists of the Lincoln Fire Department and Police Department. There is impervious area in the form of the existing building, driveways and parking lots. There is currently no existing drainage systems on site. Water currently flows to the northeast corner of the back parking lot where there is heavy signs of bank erosion adjacent to the parking lot. | Sudbury, Assabet, and Concord | No | No | Canton fine sandy loam | B | 1.90 |
| Lincoln Department of Public Works | 30 Lewis St | T4 | 4.05 | 2.63 | This parcel mainly consists of DPW offices, various equipment and stockpiles. Most of the site is impervious due to the existing building and driveways. To the south of the building there is a series of 3 existing catch basins that collect stormwater during rain events. | Charles River | No | No | Canton-Charlton-Urban land complex | A | 1.25 |
| | | | | | | | | | Narragansett-Hollis-Rock outcrop complex | A | 2.81 |
| Conservation Land | 21-35 Trapelo Road | N/A | 6.56 | 0.00 | A parcel of conservation land off of Trapelo Road. This parcel is a mix of wooded areas and open fields. Multiple walking trails exist throughout the parcel. | Charles River | Yes | No | Narragansett silt loam | A | 2.34 |
| | | | | | | | | | Windsor loamy sand | A | 0.43 |
| | | | | | | | | | Freetown muck | B/D | 0.93 |
| | | | | | | | | | Hinckley loamy sand | A | 2.85 |
| Lincoln Public Schools | 1-8 Ballfield Rd | T2, S3 | 61.31 | 12.68 | This parcel of land is comprised of the Lincoln public school system and associated driveways/parking lots. There are a few catch basins scattered around the site that outfall into the existing stream. There is also 2 existing detention basins in the northeast corner of the parcel. Additional BMPs have been constructed during recent renovations. | Charles River | Yes | Yes (Detention Basin) | Udorthents, wet substratum | 7.23107 | N/A |
| | | | | | | | | | Udorthents-Urban land complex | 29.1476002 | N/A |
| | | | | | | | | | Narragansett silt loam | 0.0607837 | A |
| | | | | | | | | | Narragansett-Hollis-Rock outcrop complex | 0.150922 | A |
| | | | | | | | | | Canton fine sandy loam, extremely stony | 3.5268099 | B |
| | | | | | | | | | Freetown muck | 3.2032599 | B/D |
| | | | | | | | | | Raypol silt loam | 3.3181701 | B/D |
| | | | | | | | | | Swansea muck | 3.4356401 | B/D |
| | | | | | | | | | Paxton fine sandy loam | 0.177339 | C |
| | | | | | | | | | Tisbury silt loam | 4.08607 | C |
| Birdsall mucky silt loam | 5.2047 | C/D | | | | | | | | | |
| Whitman fine sandy loam, extremely stony | 1.76317 | D | | | | | | | | | |
| Lincoln Town Hall | 16 Lincoln Rd | T1 | 4.14 | 0.84 | Lincoln Town Hall is comprised of municipal offices, driveways and parking areas. There is also pervious fields and woodlands to the south of town hall. The site has a series of manholes and catch basins that capture stormwater from impervious areas and eventually outfall off into the woodlands to the southwest. The existing drainage system along Lincoln road also ties into the drainage at town hall and outfalls off into the woodlands in the southwest corner of the parcel. | Charles River | No | No | Narragansett silt loam | A | 4.14 |
| Adam Woods Conservation Land | 0 South Great Rd | P3 | 223.08 | 0.75 | The site consists of open wooded conservation/park land with no existing drainage. Almost the entire parcel is pervious. | Sudbury, Assabet, and Concord | Yes | No | Water | N/A | 0.69 |
| | | | | | | | | | Canton fine sandy loam | A | 11.23 |
| | | | | | | | | | Deerfield loamy fine sand | A | 8.78 |
| | | | | | | | | | Haven silt loam | A | 5.76 |
| | | | | | | | | | Hinckley loamy sand | A | 47.23 |
| | | | | | | | | | Windsor loamy sand | A | 30.51 |
| | | | | | | | | | Merrimac fine sandy loam | A | 42.62 |
| | | | | | | | | | Scarboro mucky fine sandy loam | A/D | 4.64 |
| | | | | | | | | | Canton fine sandy loam, extremely stony | B | 1.29 |
| | | | | | | | | | Charlton-Hollis-Rock outcrop complex | B | 2.93 |
| | | | | | | | | | Freetown muck | B/D | 2.32 |
| | | | | | | | | | Saco mucky silt loam | B/D | 24.32 |
| | | | | | | | | | Scio very fine sandy loam | B/D | 10.51 |
| | | | | | | | | | Swansea muck | B/D | 30.26 |

| Description | Address | CEI Map ID | Total Parcel Area (acres) | Impervious Area (acres) | Existing Conditions Description | Watershed | Direct or Near-Direct Discharge | BMPs Present? | Soils | | |
|-------------------------|------------------|------------|---------------------------|-------------------------|--|-------------------------------|---------------------------------|---------------|---|-------------------|-------------------|
| | | | | | | | | | Soil Type | Hydric Soil Group | Soil Area (acres) |
| Codman North Open Space | 0 Codman Rd | P12 | 43.29 | 0.10 | The site consists of open wooded conservation/park land with no existing drainage. Almost the entire parcel is pervious. | Sudbury, Assabet, and Concord | No | No | Hinckley loamy sand | A | 9.39 |
| | | | | | | | | | Merrimac fine sandy loam | A | 25.08 |
| | | | | | | | | | Sudbury fine sandy loam | B | 2.20 |
| | | | | | | | | | Freetown muck | B/D | 4.12 |
| | | | | | | | | | Paxton fine sandy loam, extremely stony | C | 0.05 |
| | | | | | | | | | Paxton fine sandy loam | C | 0.04 |
| | | | | | | | | | Tisbury silt loam | C | 1.44 |
| | | | | | | | | | Birdsall mucky silt loam | C/D | 0.02 |
| | | | | | | | | | Scituate fine sandy loam, extremely stony | D | 0.95 |
| Low Income Housing | 75 Tower Rd | H1 | 0.45 | 0.08 | The site consists of 1 low income housing unit with only minor impervious area comprising of a driveway and building. There is no existing catch basins or draining on the parcel. | Charles River | Yes | No | Haven silt loam | A | 0.45 |
| Conservation Land | 0 Lincoln Rd | P8 | 45.89 | 0.01 | The site consists of open wooded conservation/park land with no existing drainage. Almost the entire parcel is pervious. | Charles River | Yes | No | Canton-Charlton-Urban land complex | A | 0.01 |
| | | | | | | | | | Narragansett silt loam | A | 0.10 |
| | | | | | | | | | Raypol silt loam | B/D | 5.24 |
| | | | | | | | | | Swansea muck | B/D | 8.79 |
| | | | | | | | | | Tisbury silt loam | C | 20.15 |
| | | | | | | | | | Birdsall mucky silt loam | C/D | 9.81 |
| | | | | | | | | | Scituate fine sandy loam | D | 1.79 |
| Tanners Brook Park | 0 North Great Rd | P6 | 87.04 | 0.00 | The site consists of open wooded conservation/park land with no existing drainage. Almost the entire parcel is pervious. | Shawsheen | Yes | No | Deerfield loamy fine sand | A | 7.75 |
| | | | | | | | | | Hinckley loamy sand | A | 7.01 |
| | | | | | | | | | Merrimac fine sandy loam | A | 27.44 |
| | | | | | | | | | Windsor loamy sand | A | 0.21 |
| | | | | | | | | | Scarboro mucky fine sandy loam | A/D | 16.02 |
| | | | | | | | | | Canton fine sandy loam | B | 11.73 |
| | | | | | | | | | Canton fine sandy loam, extremely stony | B | 0.12 |
| | | | | | | | | | Freetown muck | B/D | 1.28 |
| | | | | | | | | | Swansea muck | B/D | 6.03 |
| | | | | | | | | | Montauk fine sandy loam, extremely stony | C | 0.11 |
| | | | | | | | | | Paxton fine sandy loam | C | 1.59 |
| | | | | | | | | | Scituate fine sandy loam, extremely stony | D | 7.73 |

1. All soils data obtained from GIS sources.

Table 2 - Proposed Improvements

| Description | Address | CEI Map ID | Recommendations and Conclusions | Area For Treatment | | Pollutant Loading ¹ | | | Proposed BMP(s) | | Pollutant Reduction Estimates ² | | | BMP Implementation Costs ^{3,4} | | | | Dollars per Pound of Removal | | |
|--|--------------------|------------|--|--------------------|--------------------|----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|--|-----------------------|-----------------------------------|---|-----------------------------|----------------------------|--|------------------------------|------------------------|-------------------------|
| | | | | Total (acres) | Impervious (acres) | Impervious Area TP Load (lbs/yr) | Impervious Area TN Load (lbs/yr) | Impervious Area TSS Load (lbs/yr) | Proposed BMP(s) | Estimated Size | TP Reduction (lbs/yr) | TN Reduction (lbs/yr) | TSS Reduction (lbs/yr) | Unit Cost per CF or LF | Estimated Construction Cost | Estimated Engineering Cost | Total BMP Cost (Design & Construction) | TP Reduction (\$\$/lb) | TN Reduction (\$\$/lb) | TSS Reduction (\$\$/lb) |
| Pierce Park | 17 Weston Rd | P5 | Recommend the installation of 2 catch basins within the gravel parking area and an infiltration basin with forebay to capture the runoff. The basin will overflow into the existing pond. It is recommended that both ponds on site be dredged and rehabilitated. | 1.08 | 0.71 | 1.0 | 7.2 | 1,051 | Catch Basins | 2 Units | N/A | N/A | 305 (Approx. 25% Removal Rate) | \$5,690/Unit | \$11,400 | \$4,000 | \$15,400 | \$58,200 | \$7,700 | \$38 |
| | | | | | | | | | Infiltration Basin | 40' x 30' x 3' Deep | 1.0 | 7.2 | 1050.1 | \$8.18 | \$29,500 | \$10,400 | \$39,900 | | | |
| Codman Community Farms | 58 Codman Rd | S4 | Recommend the installation of multiple grassed water quality swales to direct runoff from the gravel road surfaces to a rain garden for treatment. Recommend the installation of 3 leaching catch basins to collect runoff from the gravel parking areas surrounding the main building. | 1.16 | 0.77 | 1.0 | 7.8 | 1,140 | Leaching Catch Basins | 3 Units | 0.7 | 3.1 | 1139.7 | \$5,690/Unit | \$17,100 | \$6,000 | \$23,100 | \$158,300 | \$32,900 | \$20 |
| | | | | | | | | | Swales | 120' x 8' x 1' (2) 40' x 8' x 1' | | | | \$8.18 | \$18,400 | \$6,500 | \$24,900 | | | |
| | | | | | | | | | Rain Garden | 40' x 25' x 2' Deep | | | | \$20.27 | \$40,600 | \$14,300 | \$54,900 | | | |
| Lincoln Fire Department and Police Station | 169 Lincoln Rd | FD1 | Recommend the installation of two catch basins, two infiltration trenches, rain garden and detention basin to collect and treat runoff from the impervious areas surrounding the fire and police station. | 0.37 | 0.32 | 0.4 | 3.3 | 474 | Catch Basins | 4 Units | 0.3 | 1.3 | 473.6 | \$5,690/Unit | \$22,800 | \$8,000 | \$30,800 | \$450,000 | \$93,500 | \$65 |
| | | | | | | | | | Infiltration Trench | 100' x 4' x 2' 90' x 3' x 2' | | | | \$16.38 | \$22,000 | \$7,700 | \$29,700 | | | |
| | | | | | | | | | Rain Garden | 30' x 15' x 2' Deep | | | | \$20.27 | \$18,300 | \$6,500 | \$24,800 | | | |
| | | | | | | | | | Detention Basin | 50' x 20' x 3' Deep | | | | \$8.92 | \$26,800 | \$9,400 | \$36,200 | | | |
| Lincoln Department of Public Works | 30 Lewis St | T4 | Recommend the installation of a catch basin, connected to the existing catch basin network on site. Downgradient of the catch basins, install a subsurface sediment separator and an outfall into the wooded area south of the site. The separator should be cleaned regularly due to the presence of material stockpiles. | 1.99 | 1.81 | 2.4 | 18.4 | 2,679 | Sediment Separator Catch Basin | 1 Catch Basin 1 Separator | N/A | N/A | 642 (Approx. 70% Removal Rate) | \$5,690/Basin \$20,000/Unit | \$25,700 | \$9,000 | \$34,700 | N/A | N/A | N/A |
| Conservation Land | 21-35 Trapelo Road | N/A | Recommend the installation of a manhole structure to intercept the main drainage line from Trapelo Road, and an infiltration basin to provide treatment. | 7.33 | 2.26 | 3.0 | 23.0 | 3,345 | Infiltration Basin | 65' x 25' x 3' | 2.8 | 22.5 | 3343 | \$8.18 | \$39,900 | \$14,000 | \$53,900 | \$19,000 | \$2,400 | \$16 |
| Lincoln Public Schools | 1-8 Ballfield Rd | T2, S3 | No Recommendations | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Lincoln Town Hall | 16 Lincoln Rd | T1 | No Recommendations | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Adam Woods Conservation Land | 0 South Great Rd | P3 | No Recommendations | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Codman North Open Space | 0 Codman Rd | P12 | No Recommendations | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Low Income Housing | 75 Tower Rd | H1 | No Recommendations | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Conservation Land | 0 Lincoln Rd | P8 | No Recommendations | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Tanners Brook Park | 0 North Great Rd | P6 | No Recommendations | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | Totals | | 4.7 | 34.2 | 6,953 | | \$272,500 | \$95,800 | \$368,300 | \$78,200 | \$10,800 | \$13 |

1. Pollutant loading calculated for impervious areas only using the land use loading rates provided in the BATT calculator for "Highway". Rates are as follows, in pounds per acre per year: 1.34 pounds of Total Phosphorus; 10.17 pounds of Total Nitrogen; 1,480.13 pounds of Total Suspended Solids

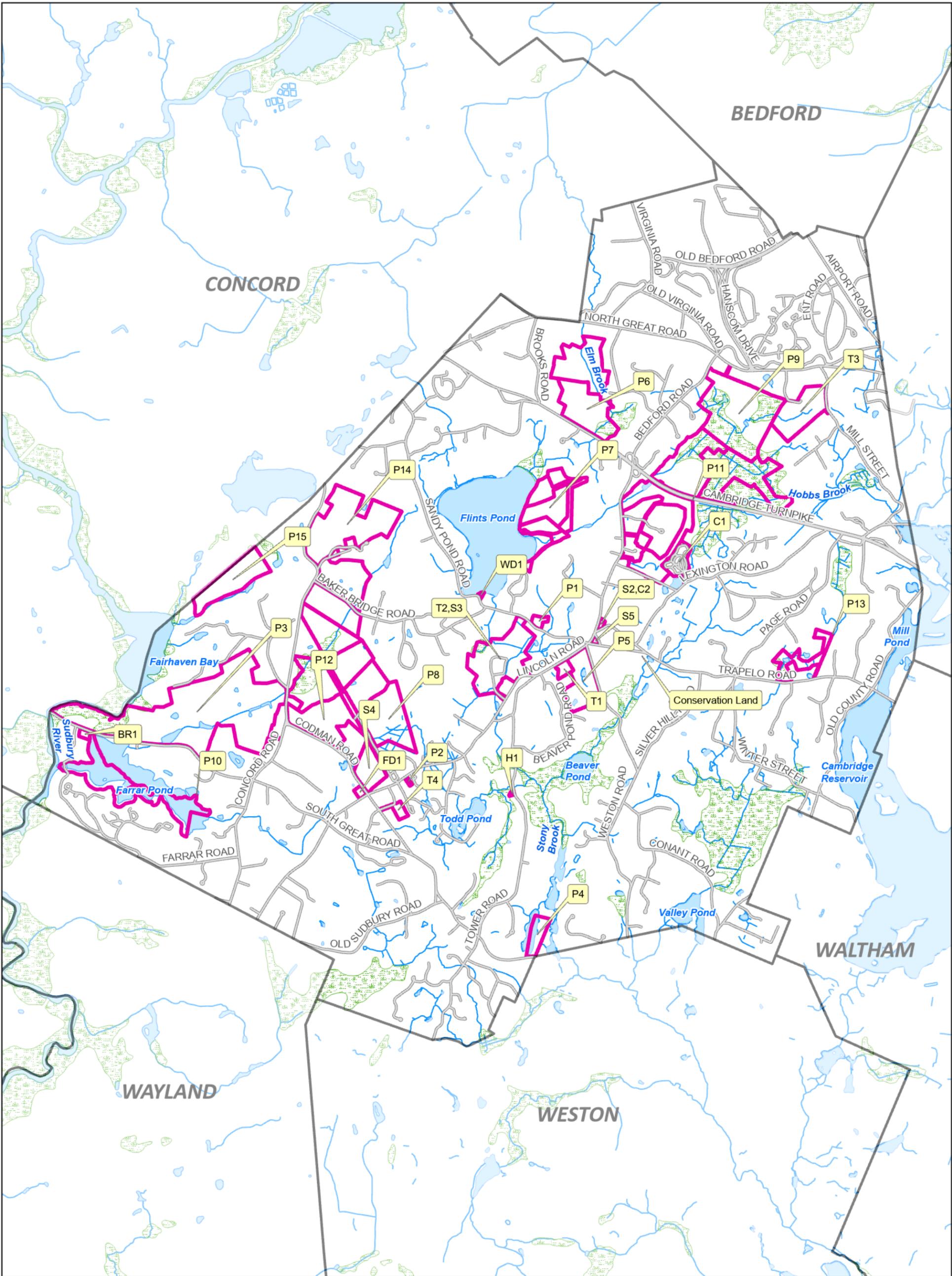
2. Pollutant reduction estimates calculated through EPA's BATT calculator

3. Information on BMP costing is attached as Attachment A.

Table 3 - BMP Costing Information

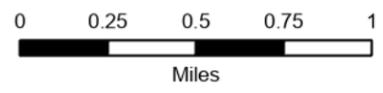
| Stormwater BMP Type | Unit | OptiTool BMP Estimates, 2016^{1,2} | OptiTool BMP Estimates, 2022³ | Adjusted BMP Estimate, 2022⁴ | Adjusted Construction Estimate⁴ | Adjusted Engineering/Contingency Estimate⁵ |
|--|-------------|---|---|--|---|--|
| Bioretention / Rain Garden | per CF | \$15.46 | \$18.24 | \$27.36 | \$20.27 | \$7.09 |
| Constructed Wetlands | per CF | \$6.80 | \$8.02 | \$12.04 | \$8.92 | \$3.12 |
| Dry Detention Basin | per CF | \$6.80 | \$8.02 | \$12.04 | \$8.92 | \$3.12 |
| Gravel Wetland | per CF | \$8.78 | \$10.36 | \$15.54 | \$11.51 | \$4.03 |
| Infiltration Basin | per CF | \$6.24 | \$7.36 | \$11.04 | \$8.18 | \$2.86 |
| Infiltration Trench | per CF | \$12.49 | \$14.74 | \$22.11 | \$16.38 | \$5.73 |
| Porous Pavement | per CF | \$5.32 | \$6.28 | \$9.42 | \$6.98 | \$2.44 |
| Sand Filter | per CF | \$17.94 | \$21.17 | \$31.75 | \$23.52 | \$8.23 |
| Wet Detention Basin | per CF | \$6.80 | \$8.02 | \$12.04 | \$8.92 | \$3.12 |
| Subsurface Infiltration/Detention System (aka Infiltration Chamber) | per CF | \$67.85 | \$80.06 | \$160.13 | \$118.61 | \$41.51 |

1. Memorandum on Methodology for developing cost estimates for Opti-Tool is provided as Attachment A.
2. Total includes cost of construction, engineering, and contingencies.
3. 2022 Estimate assumes a 18% markup from 2016 Estimate due to inflation.
4. Adjustment factor of 1.5 is applied to account for construction in developed areas.
5. Engineering/Contingency Estimate is 35% of the Construction Estimate.



Legend

- Municipal Property
- Lake, Pond, Reservoir
- Wetland, Marsh, Swamp
- Stream, Brook



**BMP Retrofit Site Inspection Map
Lincoln, MA**



Data Sources: MassGIS, Town of Lincoln, CEI



MUNICIPAL PROPERTY BMP RETROFITS

Attachment A:

BMP costing table and memorandum report on
Methodology for developing cost estimates for Opti-Tool;
February 20, 2016

MEMORANDUM

DATE: February 20, 2016
TO: Opti-Tool TAC
FROM: Karen Mateleska, EPA Region- I
SUBJECT: Methodology for developing cost estimates for Opti-Tool

Introduction

EPA – Region I offered to provide TetraTech with BMP cost information for the New England Stormwater Management Optimization Tool (Opti-Tool). The goal was to include the latest available information that would accurately reflect capital costs for select BMPs installed in the New England region. This document describes the approach used to determine these values.

The unit cost estimates originally developed as part of a 2010 study were used as the basis/starting-point for the cost estimates for the Opti-Tool. This study, entitled *Stormwater Management Plan for Spruce Pond Brook Subwatershed*, was produced by the Charles River Watershed Association (CRWA). The full report can be viewed at: http://www.crwa.org/hs-fs/hub/311892/file-636820515-pdf/Our_Work/Blue_Cities_Initiative/Scientific_and_Technical/CRWA_Franklin_Plan.pdf. This subwatershed in the Town of Franklin (in eastern Massachusetts) was selected, in part, because it represented one of the many communities in the watershed that would be required to reduce nutrient (phosphorus) loads in stormwater runoff as part of EPA's Phase II MS4 General Stormwater Permit and a TMDL for Nutrients in the Upper/Middle Charles River. The cost estimates developed in the study can predominantly be attributed to CRWA and both Rich Claytor and Nigel Pickering of Horsley Witten Group (CRWA *et al.* 2010). The development of these costs was based on a literature review of BMP cost information and Claytor's extensive experience working in this field with Massachusetts communities. These values were originally reported in Appendix B of the aforementioned CRWA document. Those cost estimates have also been used in additional stormwater studies supported by EPA – Region I, including the *Sustainable Stormwater Funding Evaluation for the Upper Charles River Communities of Bellingham, Franklin, and Milford, MA* (2011). (That report can be viewed at: <http://www.epa.gov/region1/npdes/charlesriver/pdfs/20110930-SWUtilityReport.pdf>)

Before simply relying on the CRWA cost estimates, additional research was conducted of publicly available (online) resources to determine if more recent BMP cost information for the New England region was available. These resources included:

- EPA's LID webpage: <http://water.epa.gov/polwaste/green/>
- EPA's 2013 Article: *Case Studies Analyzing the Economic Benefits of Low Impact Development and Green Infrastructure Programs*: http://water.epa.gov/polwaste/green/upload/lid-gi-programs_report_8-6-13_combined.pdf

- New England Environmental Finance Center: <http://efc.muskie.usm.maine.edu/>
- UNC Environmental Finance Center's *Catalog of Finance Publications on Green Infrastructure Approaches to Stormwater Management* (This spreadsheet provides a catalog of 46 publications related on green infrastructure for stormwater management that have finance relevance; Several of the sources from the catalog were reviewed for this document) : <http://www.efc.sog.unc.edu/reslib/item/catalog-green-infrastructure-and-stormwater-finance-publications>
- Houle, *et al.* *Comparison of Maintenance Cost, Labor Demands, and System Performance for LID and Conventional Stormwater Management*: http://www.unh.edu/unhsc/sites/unh.edu.unhsc/files/Houle_JEE_July-2013.pdf
- University of New Hampshire Stormwater Center's *Forging the Link: Linking the Economic Benefits of LID and Community Decisions*: <http://www.unh.edu/unhsc/forging-link-topics>
- Center for Neighborhood Technology's *Green Values Stormwater Tool Box*: <http://greenvalues.cnt.org/> which included the Green Values Calculator: <http://greenvalues.cnt.org/national/calculator.php>
- Water Environment Research Foundation (WERF): User's Guide to the BMP and LID Whole Life Cost Models, Version 2.0: www.werf.org/bmpcost
- Low Impact Development Center: <http://www.lowimpactdevelopment.org/>
- ECONorthwest's *The Economics of Low-Impact Development: A Literature Review*: <http://www.econw.com/our-work/publications/the-economics-of-low-impact-development-a-literature-review/>
- Drexel University's Low Impact Development Rapid Assessment (LIDRA Model) <http://www.lidratool.org/home/publications.aspx>

A review of these resources did highlight the multitude of variables that can impact the cost of installing LID BMPs and the variety of cost analysis methods that can be used when assessing the cost effectiveness of various LID storm water controls. For example, many of the resources emphasized that costs tend to be site specific. Costs often differ significantly among different geographical locations, depending upon labor and material expenses and the constraints of a particular site. Unfortunately, most of the aforementioned resources highlighted projects outside of the New England region (with the exception of the articles by Houle of the UNHSC and New England Environmental Finance Center.)

EPA's recent (2013) report entitled *Case Studies Analyzing the Economic Benefits of Low Impact Development and Green Infrastructure Programs* listed the 7 different types of economic analyses that were represented by the 13 case studies highlighted in the report. These ranged from the simplest form of economic analysis (i.e., the capital cost assessment) to more robust forms, including the life cycle cost assessment. Whole life-cycle costs would provide a more accurate estimate of the cost of installing, operating, maintaining, and replacing a project (i.e., BMP) throughout its expected lifetime. However this type of analysis requires solid estimates for capital, land purchase, O&M, and other related costs.

Ideally, the goal was to include a more advanced economic analysis (i.e. –life cycle costs) in the Opti-Tool while still maintaining some level of simplicity for the end user. However, such a robust economic analysis does not currently appear possible because the literary search for more recent BMP cost estimates, reflective of New England states, was largely unsuccessful. However, the search was not

entirely fruitless. Jamie Houle of the UNHSC did provide extremely valuable information on capital and maintenance costs for various BMPs that have been tested at the UNHSC. Cost estimates for a particular BMP available from *both* the CRWA study and UNHSC were discussed among Mark Voorhees of EPA, Jamie Houle of UNHSC, and Karen Mateleska of EPA, and a best professional judgment decision was made.

The recommendation at this time is to use a combination of the CRWA cost estimates **and** UNHSC costs estimates as the basis for the Opti-Tool BMP cost estimates, and to use a modified capital cost assessment (which includes a fixed percentage for Design and Contingency Costs) as well as a separate field for maintenance hours (from the UNHSC). The details supporting this approach are described below.

Overview of Scope and Approach

According to a draft memo, dated 6/20/14 from Tetra Tech to EPA Region I, the current SUSTAIN BMP Cost function has seven major individual components, using a formula that would likely be useful in a more detailed design mode. For purposes of simplicity, EPA Region I is proposing the following cost function formula for the tool's "planning" mode:

| |
|---|
| General Cost Function Formula = Storage Volume of BMP* (ft ³) X Cost Estimate for BMP (\$/ft ³) X Adjustment Factor |
|---|

* Storage Volume of BMP is more accurately defined as (Design) Physical Storage Capacity of BMP; See Section A below for more details

Initially, the intention was to include the preliminary Operations and Maintenance (O&M) costs in the general formula (page 3) by simply multiplying the formula results by our Preliminary O & M costs. However, such an approach would only include **one year's worth** of operations and maintenance, which could have been misleading because it would not have reflected the true life cycle cost of the BMP (i.e., assume life cycle of 20 years). However, simply including the 20 year life cycle cost (O&M cost *20) in the above formula would have greatly increased the cost value and perhaps have created misconceptions about BMP use and affordability.

Therefore, the subcommittee decided to include the anticipated operation and maintenance **hours** required for each BMP per year instead. This parameter was included as a completely separate field in the Opti-Tool. The rationale was that Opti-Tool users need to understand that operation and maintenance impact the overall cost-effectiveness of BMPs and should be considered when selecting a BMP. Including O&M hours (instead of costs) as a separate field, would still highlight this important consideration for stormwater managers.

A. Storage Volume and Proposed Cost Estimate Values

As highlighted above, the general cost function formula used in the Opti-Tool consists of 3 factors: the BMP storage volume, the proposed BMP storage volume cost estimate, and the adjustment factor. The first two factors will be covered together in this memo because they are so closely linked. Table 1 below summarizes the proposed BMP cost estimates for the Opti-Tool.

Table 1: Proposed BMP Cost Estimates for Opti-Tool

| BMP (From Opti-Tool) | Cost (\$/ft ³) ¹ | Cost (\$/ft ³) – 2016 dollars ⁶ |
|---|---|--|
| Bioretention (Includes rain garden) | 13.37 ^{2,4} | 15.46 |
| Dry Pond or detention basin | 5.88 ^{2,4} | 6.80 |
| Enhanced Bioretention (aka-Bio-filtration Practice) | 13.5 ^{2,3} | 15.61 |
| Infiltration Basin (or other Surface Infiltration Practice) | 5.4 ^{2,3} | 6.24 |
| Infiltration Trench | 10.8 ^{2,3} | 12.49 |
| Porous Pavement - Porous Asphalt Pavement | 4.60 ^{2,4} | 5.32 |
| Porous Pavement - Pervious Concrete | 15.63 ^{2,4} | 18.07 |
| Sand Filter | 15.51 ^{2,4} | 17.94 |
| Gravel Wetland System (aka-subsurface gravel wetland) | 7.59 ^{2,4} | 8.78 |
| Wet Pond or wet detention basin | 5.88 ^{2,4} | 6.80 |
| Subsurface Infiltration/Detention System (aka-Infiltration Chamber) | 54.54 ⁵ | 67.85 |

¹ Footnote: Includes 35% add on for design engineering and contingencies

² Costs in 2010 dollars

³ From CRWA Cost Estimates

⁴ From UNHSC Cost Estimates; Most of original costs were from 2004 and converted to 2010 dollars using U.S. Department of Labor (USDOL). (2012). Bureau of Labor Statistics consumer price index inflation calculator. http://www.bls.gov/data/inflation_calculator.htm

⁵ From Cost Estimate of MA TT Rizzo Project (2008 Dollars)

⁶ 2010 costs were converted to 2016 values to adjust for inflation. The ENR Cost Index Method was used for this conversion.

Table 1 includes all of the BMPs that are included in the Opti-Tool. The unit costs represent the dollar amount (\$) per cubic foot of storage volume (ft³), where the storage volume reflects the (design) physical static storage capacity that the relevant BMP can hold. This volume includes the volume of ponding water *and* the volume of water retained in the porous media or subbase materials if applicable. (This storage volume does *not* represent the *treated* volume of stormwater, which may be significantly higher than the physical storage volume of a BMP particularly for systems that are sized dynamically or

by a water quality flow rate as opposed to a water quality volume.) This unit cost per storage volume captured by a BMP differs from other (perhaps more traditional) methods that can be used. By choosing to use the unit cost per storage volume instead of volume of water treated, we are trying to eliminate confusion over what the actual dimensions of the BMP will be for the costs being estimated. Additionally, this use of the unit cost per storage volume is consistent with the approach used in developing the BMP performance curves (used in the Opti-Tool) where the x-axis is the actual **physical storage capacity** to hold water. Lastly, expressing the unit costs in this manner will benefit users who are simply interested in using the unit costs (outside of the Opti-Tool) by eliminating the step of modeling hydrology and routing the water through the BMP, which can yield widely varying results depending on modeling approach and supporting assumptions. Attachment A describes the method used in calculating the design storage volume for each of the selected BMPs.

Also, each unit cost per storage value represents the capital cost of construction/installation of the BMP and includes a 35% design/engineering/contingency (D & E) cost. This 35% fixed percentage of the total construction cost follows a general “rule of thumb,” often used by consulting firms. Based upon a conversation between Mark Voorhees and Jamie Houle (two members of the Opti-Tool cost subcommittee), a decision was made to include this D&E cost. The values in Table 1 do *not* include the cost of purchasing any land, nor does it include any O&M costs (which is discussed in more detail in a subsequent section). Therefore, each unit cost in Table 1 that was based on the CRWA’s 2010 values was calculated by multiplying the relevant BMP cost by 1.35.

Since the CRWA study did not include cost estimates for porous pavement or sand filters, which are BMPs included in the Opti-Tool, relevant data was obtained from Jamie Houle of the University of New Hampshire Stormwater Center (UNHSC). He also provided additional cost estimates (as denoted by Footnote 4 in Table 1) for some of the other BMPs included in the tool. UNHSC can provide valuable data because they have been directly involved with the engineering, design and construction of numerous LID controls, as well as evaluating multiple stormwater treatment systems over multiple years at their primary field research facility in Durham, N.H. Since they could provide cost information for both porous asphalt pavement and pervious concrete, separately, the general category of porous pavement was divided into the aforementioned two sub-categories.

It should be noted that the costs used for the Opti-tool *assume linearity*, which will both allow for *and* incentivize the scaling to smaller-sized systems. For example, EPA has estimated that *smaller* capacity designs for BMPs, rather than large-sized BMPs, can increase both the technical and economic feasibility of installing controls, particularly for retrofits. The assumption of linearity was made for the following reasons: 1) Limited data currently exists on the cost of small capacity systems. Until a larger pool of cost data becomes available which will allow for the development of a non-linear cost curve, the current method is the best available alternative; 2) As the installation of smaller systems becomes more widespread, it is likely that economies of scale will develop and cost savings will occur. For example, if one entity is contracted to install multiple small systems at once, materials can be bought in bulk and the installation process can become more efficient and less expensive; 3) An undersized system built to treat a large area can be a very cost effective approach. As an example, there should not be a significant cost difference between a 1-inch system treating 1 acre and a 1/10-inch-system that treats 10 acres, since the absolute capacity of the system is the same in both cases. This topic of linearity will be revisited in the future when more data is available.

Since UNHSC typically calculates the capital costs per cubic foot (ft³) *treated*, using WQv, Jamie Houle converted the costs to represent the capital costs per BMP storage volume (ft³). This was necessary so the capital cost data would be consistent with the method used in the Opti-Tool. Also, all of the costs were converted to 2010, and ultimately 2015, dollars. As with the CRWA costs, the UNHSC capital costs were already adjusted to include the 35% design/engineering/contingency (D & E) cost. Details of all of these calculations, and any other assumptions made, are presented in Attachment B.

When developing cost estimates, another topic for consideration was whether or not to address the issue of inflation. CRWA's BMP cost estimates were based on capital costs from 2010. As previously stated, UNHSW's cost estimates have also already been converted to constant 2010 dollars using consumer price index inflation rates [U.S. Department of Labor (USDOL) 2014].¹ Therefore, there was the option of converting all of these 2010 costs to 2016 costs, using the U.S. Department of Labor's consumer price index inflation calculator. However, another suggestion was made to use the ENR Cost Index method to adjust for inflation instead because it more closely tracks construction work. At least one New England state (i.e., Vermont) also uses the ENR Cost Index method, so this could provide some consistency, as well. Therefore, the decision was made to ultimately convert all of the costs to 2016 values using the ENR Cost Index method. These values are reflected in Table 1.

To use the index, one calculates the quotient of the current index number (based on the month and year of *current* date) divided by the index number from a given date (e.g., June of 2010). Since the month was not known for the 2010 costs, the month of June was used as an estimate. This assumption was used because it falls mid-way between the construction season and would likely provide a reasonable estimate. Once the quotient was calculated, it was multiplied by the construction cost (found in the middle column in Table 1, above) to provide the 2016 construction cost value

B. Cost Adjustment Factor

Since the cost of installing a BMP will vary depending on the specific site location, the TAC subcommittee believed it was important for the Opti-Tool to include a scalable cost adjustment factor. The proposed cost estimates for the Opti-Tool (in Table 1) are all based on a Cost Adjustment Factor of 1. However, each Opti-Tool user has the option to choose and enter into the tool a cost adjustment factor that is appropriate for their site. This will adjust the storage volume cost function in the Opti-Tool.

For example, the CRWA report included the cost factors summarized in Table 2.

¹ Reference: U.S. Department of Labor (USDOL). (2014). Bureau of Labor Statistics consumer price index inflation calculator." (http://www.bls.gov/data/inflation_calculator.htm)(Sep. 12, 2014)

Table 2: Example of Cost Adjustment Factors

| BMP Type | **EXAMPLE** Cost Adjustment Factor |
|---|---|
| New BMP in undeveloped area | 1 |
| New BMP in partially developed area | 1.5 |
| New BMP in developed area | 2 |
| Difficult installation in highly urban settings | 3 |

(Source: Table 4 of Appendix B of CRWA's Spruce Pond Brook Subwatershed Project for Town of Franklin)

The assumption made was that it would cost more to install a new BMP in a developed area (with more site constraints) than it would cost to install the same BMP in a previously undeveloped area. So in the above example, the cost adjustment factor would be 2 for installing a BMP in a previously developed area versus a cost adjustment factor of 1 for installing a BMP in an undeveloped area.

It should be noted that Table 2 (above) provides just *one example* of adjustment factors. The factor should be flexible enough so that another location (or Opti-Tool user) can adjust it, as needed. For example, the Charles River Watershed (in eastern Massachusetts) used an adjustment factor of 2 for installing a BMP in a developed area, while the State of Vermont uses an adjustment factor of 1.4 to estimate the cost of installing a BMP for existing development.

C. Maintenance (O&M) Costs

Originally, one goal was to include Operation and Maintenance (O&M) costs as part of the cost estimates for the Opti-Tool. These O&M costs would help to provide a more realistic reflection of the long-term expenses of structural storm water controls, which is obviously critical in the practical, real-world implementation of BMPs. However, it is difficult to obtain accurate maintenance costs and they will be highly variable depending on the size, location and equipment needed to perform long-term O&M.

This point was highlighted by a key finding in EPA's recent (2013) publication, *Case Studies Analyzing the Economic Benefits of Low Impact Development and Green Infrastructure Programs*. The report indicated that only a small percentage of the entities that implement LID and GI approach for stormwater management conduct economic analyses due to the "uncertainties surrounding costs, operation and maintenance (O&M) requirements, budgetary constraints, and difficulties associated with quantifying the benefits provided by LID/GI" and the need "to obtain better estimates of the O&M costs associated with different types of LID/GI projects" was a key finding of the report.

As previously mentioned, one article entitled, *Comparison of Maintenance Cost, Labor Demands, and System Performance for LID and Conventional Stormwater Management* (Houle et al. 2013), did contain relevant information for BMP costs in the New England region. During initial discussions between EPA Region I (Mark Voorhees) and UNHSC (Jamie Houle), there was concern that not enough data existed on O&M costs to propose accurate values for each of the BMPs included in the Opti-Tool. There was also

the concern that the O&M costs were not scaleable. For example, initial O&M costs for each BMP were based on the cost of operation and maintenance per year per acre of IC treated. Scaled differences such as the annual O&M costs for treating 0.5 acres of IC or 2 acres of IC have **not** been evaluated and may or may **not** result in a simple linear relationship. Yet the Opti-Tool costs subcommittee also realized the importance of including some maintenance parameter in order to *initiate* the conversation on the importance of accounting for O&M to maintain the functionality of the BMPs. Therefore Table 3, below, presents these annual maintenance costs (in \$) for select BMPs, as well as the annual maintenance hours. Although the O&M costs have been presented in this memo, only the O&M **hours** will be included (as a separate field) in the Opti-Tool.

Table 3: Maintenance Costs (\$) and Hours per year for select BMPs – From UNHSC

| BMP | Maintenance Cost (\$) per year | Annual Maintenance Hours |
|-------------------|---------------------------------------|---------------------------------|
| Bioretention | \$1,890.00 | 20.7 |
| Chamber System | Not Assessed | Not Assessed |
| Detention Pond | \$2,380.00 | 24.0 |
| Gravel Wetland | \$2,138.33 | 21.7 |
| Porous Asphalt | \$1,080.00 | 6.0 |
| Pervious Concrete | \$1,080.00 | 6.0 |
| Retention Pond | \$3,060.00 | 28.0 |
| Sand Filter | \$2,807.50 | 28.5 |

*Note: initial costs based on cost of maintenance per year per acre of IC treated

Annual maintenance strategies were evaluated by directly quantifying hours spent categorizing maintenance activities, and assessing difficulty of those activities. To better illustrate costs and anticipate maintenance burdens, activities were characterized into distinct categories and a standard cost structure was applied. This unit conversion can easily be adapted according to local conditions, current economic climate, and regional cost variations which is why we decided to go with maintenance **hours** as those were directly measured and should remain constant. These maintenance activity categories allow more accurate cost predictions and provide insight into the appropriate assignment of maintenance responsibilities.

Annual maintenance costs were normalized to 2012 dollars and calculated for all SCMs by both dollars and personnel hours per acre of IC treated per system per year. It is important to note that inflation was not considered in life cycle maintenance cost projections.



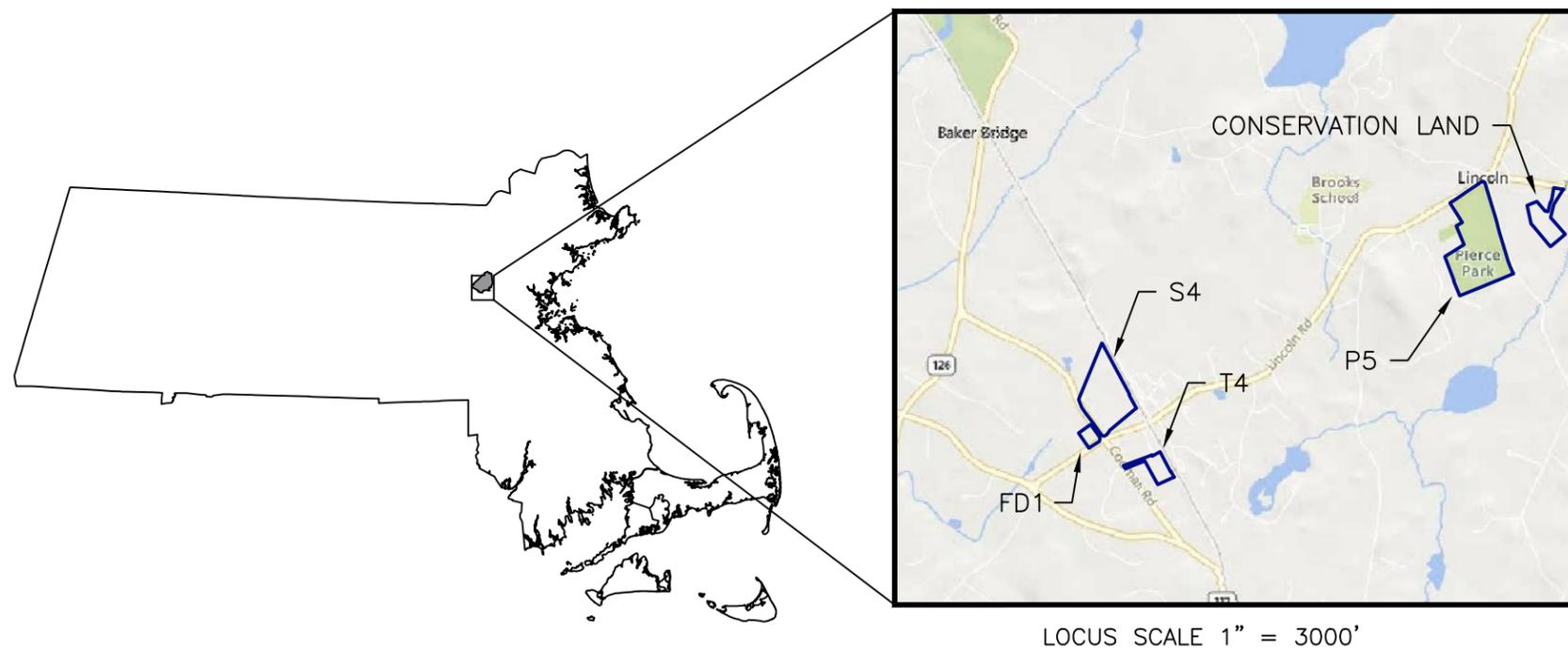
MUNICIPAL PROPERTY BMP RETROFITS

Attachment B:
Pre-Conceptual Designs for Top Locations

TOWN OF LINCOLN, MA

MUNICIPAL PROPERTY BMP RETROFIT OPPORTUNITIES

JUNE 2022



| <u>SHEET</u> | <u>TITLE</u> |
|--------------|----------------------------|
| C-1 | PIERCE PARK |
| C-2 | CODMAN COMMUNITY FARMS |
| C-3 | PUBLIC SAFETY COMPLEX |
| C-4 | DEPARTMENT OF PUBLIC WORKS |
| C-5 | CONSERVATION LAND |



COMPREHENSIVE ENVIRONMENTAL INCORPORATED

• BOLTON, MASSACHUSETTS



GENERAL NOTES

LEGEND

- PROJECT PARCEL
- PROPERTY LINE
- EXISTING DRAIN PIPE
- EXISTING CATCH BASIN
- EXISTING DRAIN MANHOLE
- EXISTING BUILDING
- EDGE OF PAVEMENT
- PROPOSED DRAIN PIPE
- PROPOSED CATCH BASIN
- FLOW DIRECTION ARROW

**COMPREHENSIVE ENVIRONMENTAL
INCORPORATED**

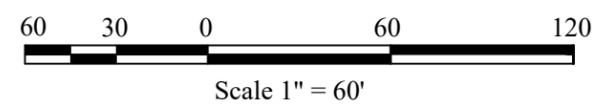


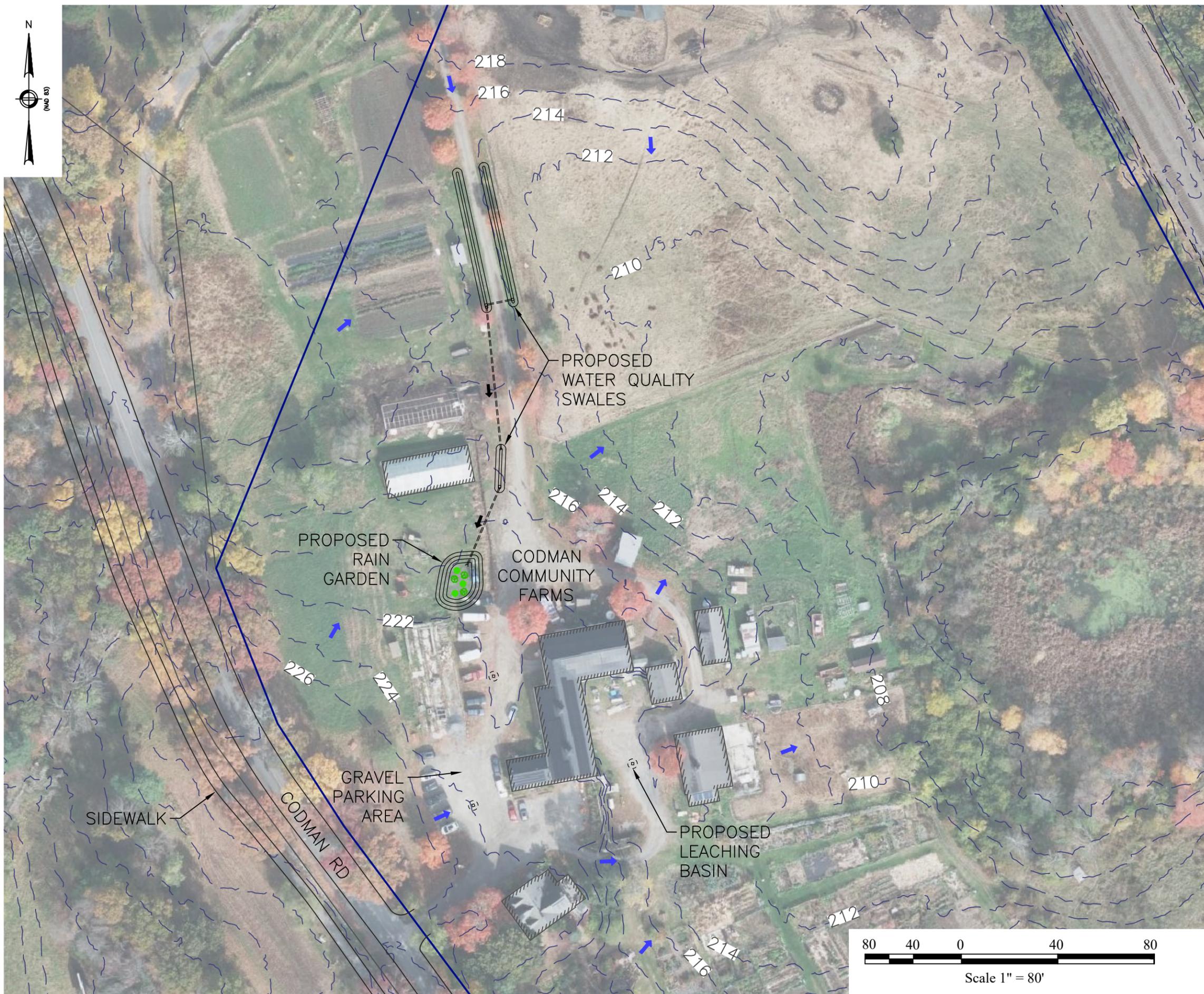
41 MAIN STREET
BOLTON, MA 01740

**PROPOSED CONDITIONS
PIERCE PARK
PLAN VIEW**

TOWN OF LINCOLN, MA

| | |
|---------------------|-------|
| Project No.: 250-13 | Sheet |
| Date: 03-21-2022 | C-1 |
| Drawn By: NP | |
| Checked By: NC | |
| Scale: AS SHOWN | |





GENERAL NOTES

LEGEND

- PROJECT PARCEL
- PROPERTY LINE
- EXISTING DRAIN PIPE
- EXISTING CATCH BASIN
- EXISTING DRAIN MANHOLE
- EXISTING BUILDING
- EDGE OF PAVEMENT
- PROPOSED DRAIN PIPE
- PROPOSED CATCH BASIN
- FLOW DIRECTION ARROW

**COMPREHENSIVE ENVIRONMENTAL
INCORPORATED**

41 MAIN STREET
BOLTON, MA 01740

**PROPOSED CONDITIONS
CODMAN COMMUNITY FARMS
PLAN VIEW**

TOWN OF LINCOLN, MA

| | |
|---------------------|-------------------------|
| Project No.: 250-13 | Sheet C-2 |
| Date: 03-22-2022 | |
| Drawn By: NP | |
| Checked By: NC | |
| Scale: AS SHOWN | |



GENERAL NOTES

LEGEND

-  PROJECT PARCEL
-  PROPERTY LINE
-  EXISTING DRAIN PIPE
-  EXISTING CATCH BASIN
-  EXISTING DRAIN MANHOLE
-  EXISTING BUILDING
-  EDGE OF PAVEMENT
-  PROPOSED DRAIN PIPE
-  PROPOSED CATCH BASIN
-  FLOW DIRECTION ARROW

**COMPREHENSIVE ENVIRONMENTAL
INCORPORATED**



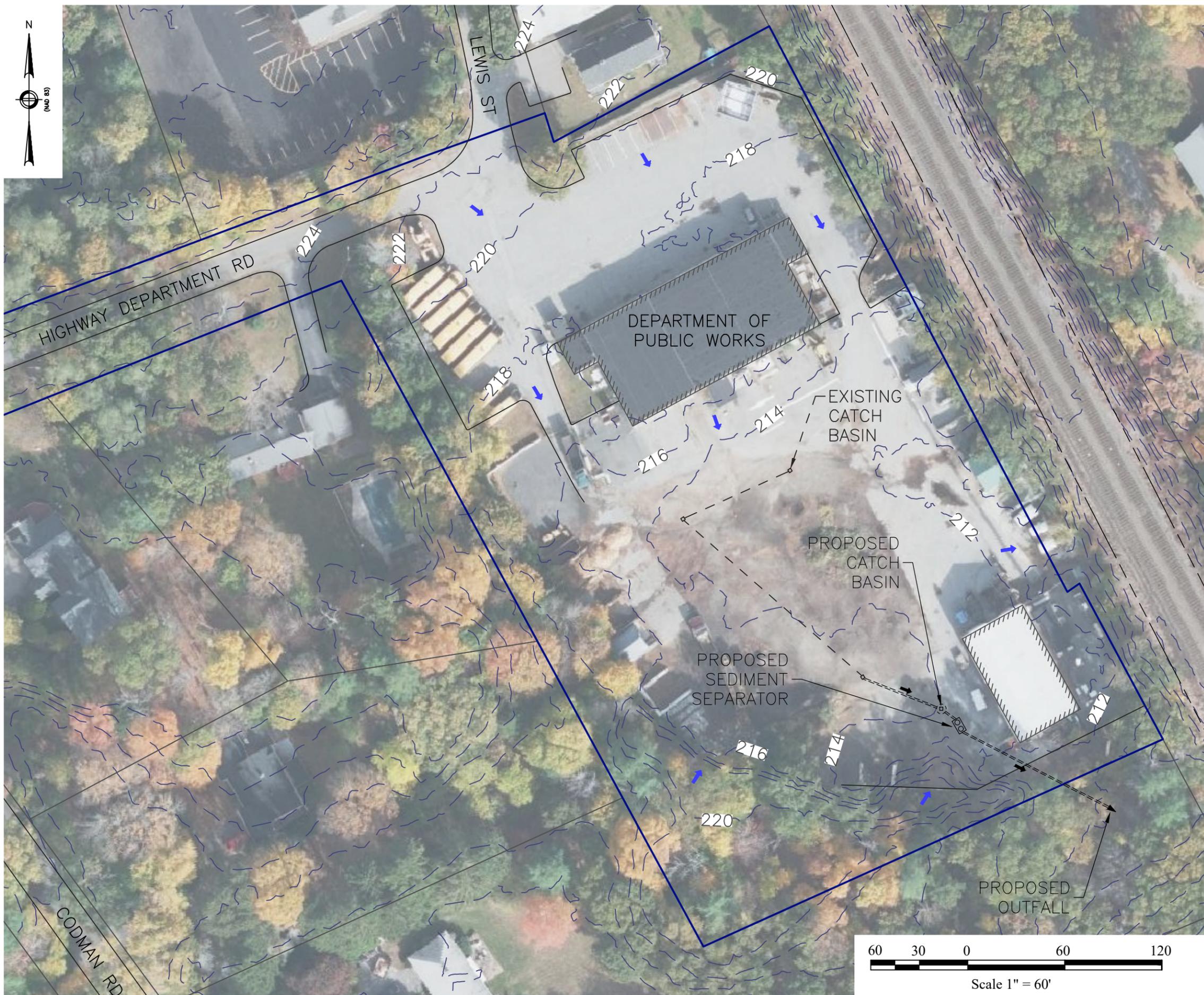
41 MAIN STREET
BOLTON, MA 01740

**PROPOSED CONDITIONS
PUBLIC SAFETY COMPLEX
PLAN VIEW**

TOWN OF LINCOLN, MA

| |
|---------------------|
| Project No.: 250-13 |
| Date: 03-21-2022 |
| Drawn By: NP |
| Checked By: NC |
| Scale: AS SHOWN |

Sheet
C-3



GENERAL NOTES

LEGEND

-  PROJECT PARCEL
-  PROPERTY LINE
-  EXISTING DRAIN PIPE
-  EXISTING CATCH BASIN
-  EXISTING DRAIN MANHOLE
-  EXISTING BUILDING
-  EDGE OF PAVEMENT
-  PROPOSED DRAIN PIPE
-  PROPOSED CATCH BASIN
-  FLOW DIRECTION ARROW

**COMPREHENSIVE ENVIRONMENTAL
INCORPORATED**



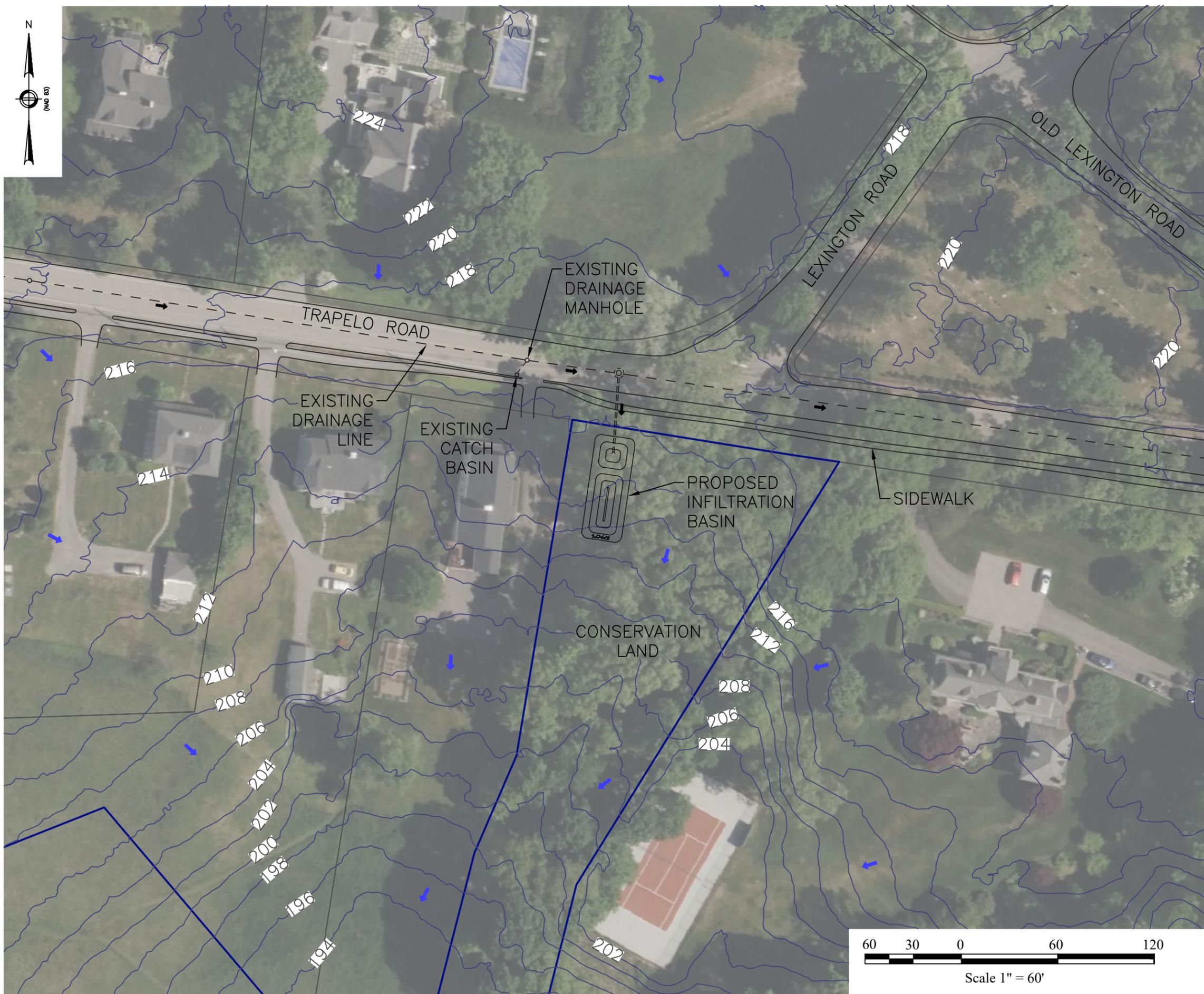
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BOLTON, MA 01740

**PROPOSED CONDITIONS
DEPARTMENT OF PUBLIC
WORKS
PLAN VIEW**

TOWN OF LINCOLN, MA

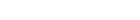
Project No.: 250-13
Date: 03-21-2022
Drawn By: NP
Checked By: NC
Scale: AS SHOWN

Sheet
C-4



GENERAL NOTES

LEGEND

-  PROJECT PARCEL
-  PROPERTY LINE
-  EXISTING DRAIN PIPE
-  EXISTING CATCH BASIN
-  EXISTING DRAIN MANHOLE
-  EXISTING BUILDING
-  EDGE OF PAVEMENT
-  PROPOSED DRAIN PIPE
-  PROPOSED CATCH BASIN
-  FLOW DIRECTION ARROW

**COMPREHENSIVE ENVIRONMENTAL
INCORPORATED**

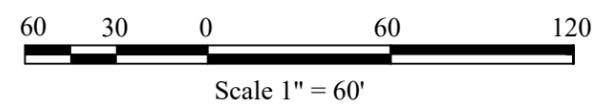


41 MAIN STREET
BOLTON, MA 01740

**PROPOSED CONDITIONS
CONSERVATION LAND
PLAN VIEW**

TOWN OF LINCOLN, MA

| | |
|---------------------|-------------------------|
| Project No.: 250-13 | Sheet C-5 |
| Date: 03-21-2022 | |
| Drawn By: NP | |
| Checked By: NC | |
| Scale: AS SHOWN | |

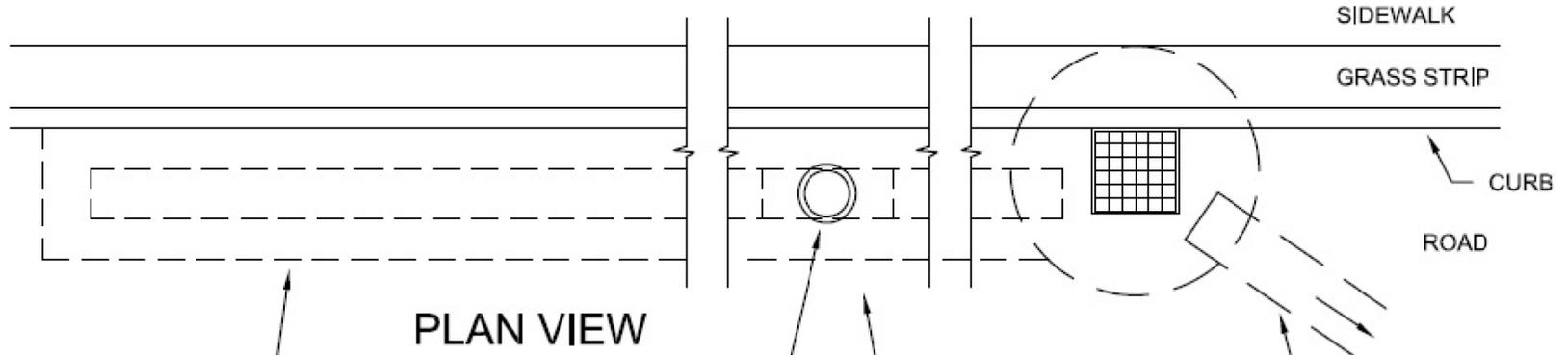




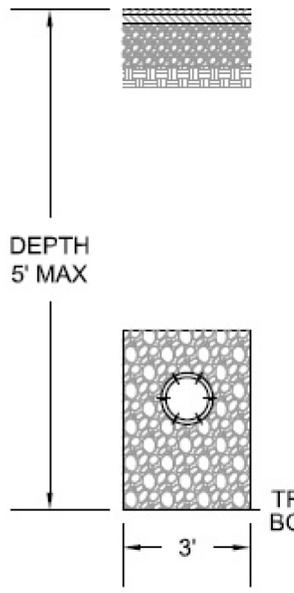
MUNICIPAL PROPERTY BMP RETROFITS

Attachment C:
Example Roadway and Intersection BMP Improvements

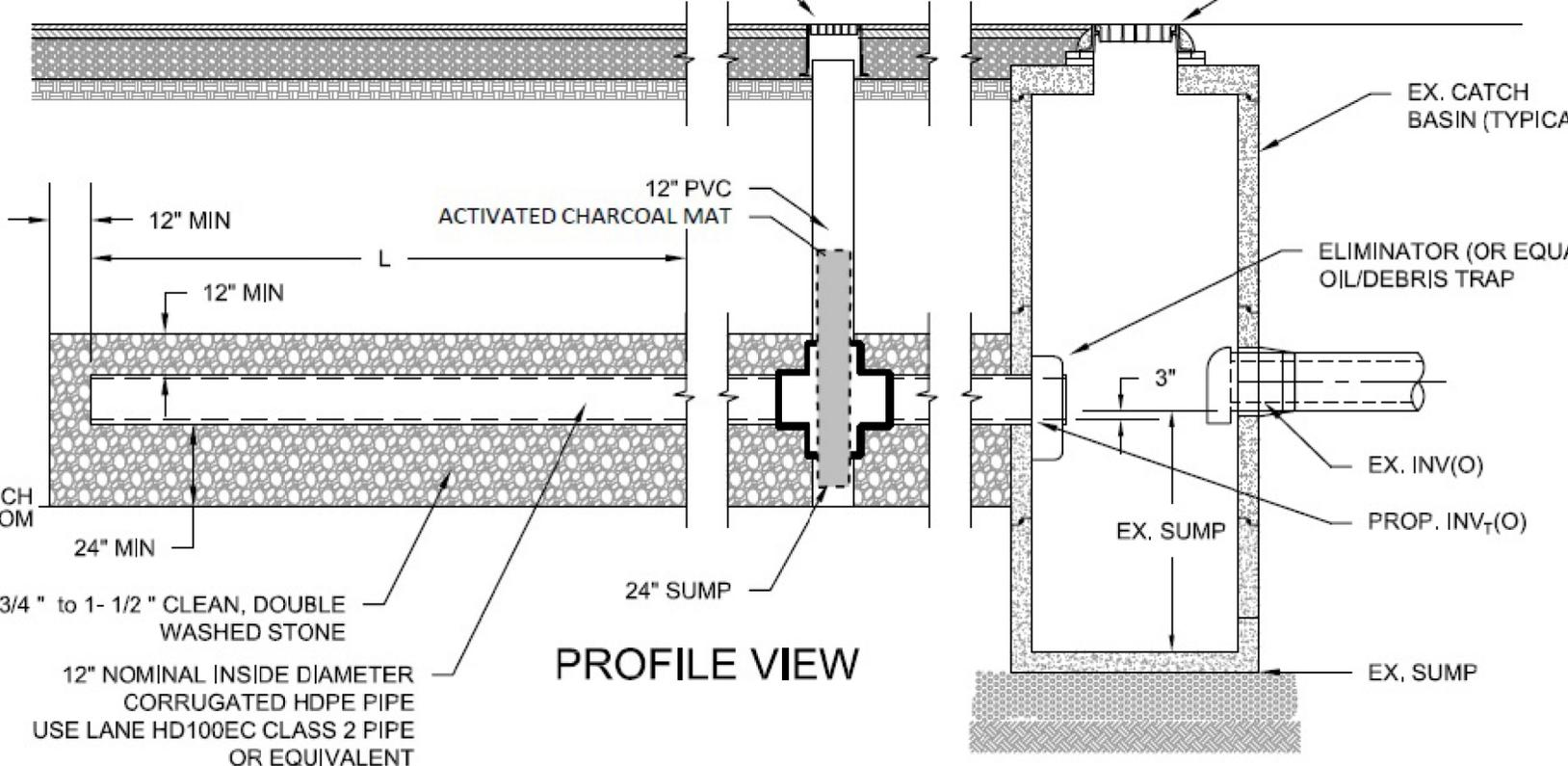
| |
|----------------------------|
| TRENCH ID: |
| LOCATION: |
| EX. RIM: |
| EX. INV(0): |
| PROP INV ₇ (0): |
| TRENCH BOT: |
| EX. SUMP: |



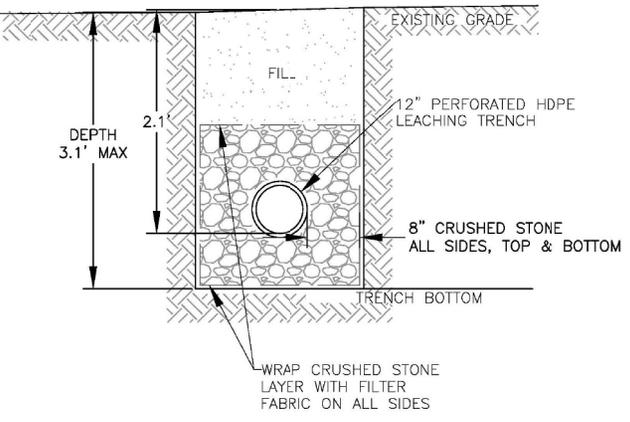
PLAN VIEW



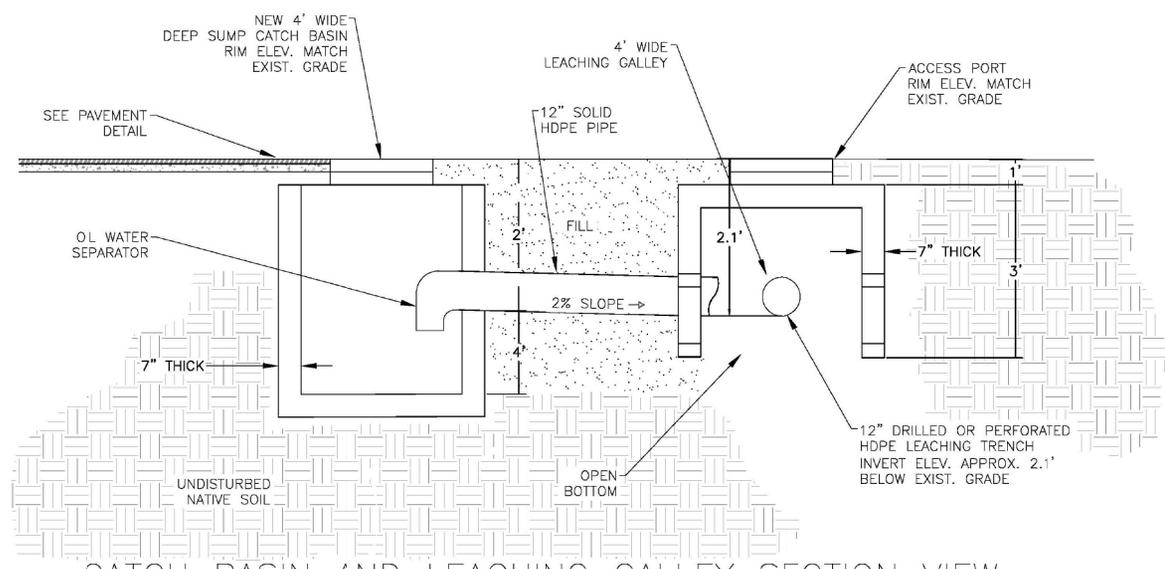
CROSS SECTION



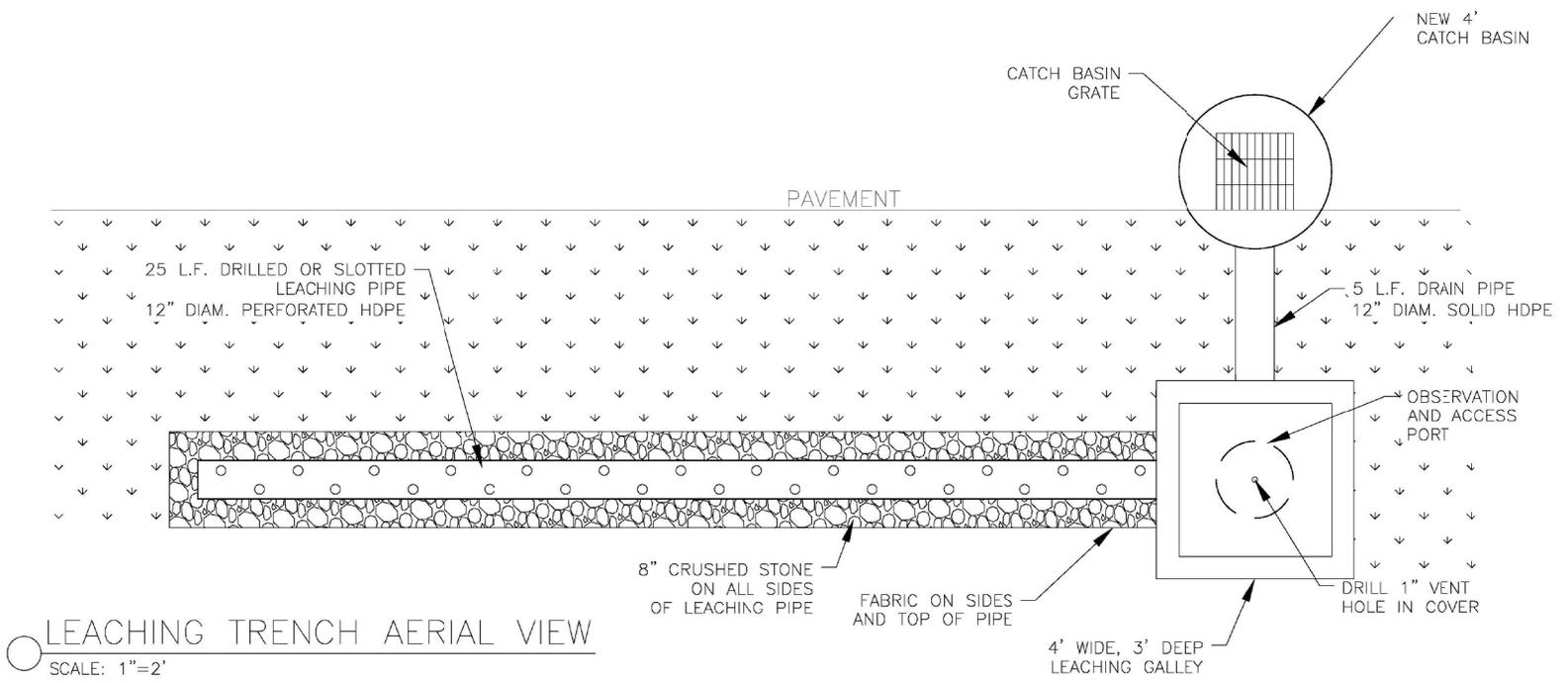
PROFILE VIEW



LEACHING TRENCH SECTION VIEW
SCALE: N.T.S.



CATCH BASIN AND LEACHING GALLEY SECTION VIEW
SCALE: 1"=3'



LEACHING TRENCH AERIAL VIEW
SCALE: 1"=2'

Appendix F

Street Sweeping Optimization Plan

MI-1, Street Sweeping

Street sweeping is performed to remove sediments from streets and parking lots before it is washed into catch basins and waterways. The Lincoln Department of Public Works currently sweeps all streets, including those outside of the MS4, annually in the spring for a total of approximately 102 lane miles using an Elgin Pelican street sweeper. Main roads and those streets with an excessive amount of leaves may be swept again in the fall. After collection, Lincoln stores street sweepings at the DPW temporarily in an area that does not drain to wetlands, the MS4, or other sensitive areas. Sweepings are eventually disposed of at the Fitchburg-Westminster Landfill.

Procedures and Practices

- Sweep all Town-owned streets within the urbanized area with the exception of high-speed limited access highways at least once per year in the spring.
- For areas subject to nitrogen and phosphorus TMDL and impaired waters requirements, sweep streets once in the spring and once in the fall.
- If required, sweep priority areas such as those with construction sites or areas subject to heavier sanding and/or traffic volumes multiple times a year to minimize sediment accumulation.
- Sweep all Town parking lots in spring after snow melts.
- If possible, notify residents and businesses of street sweeping schedule and requirements such as restricted parking and removal of objects that could obstruct sweeping operations.
- Lightly spray water on streets before sweeping to minimize airborne dust.
- Avoid pushing materials into or around storm drains and catch basins.
- Do not use kick brooms or sweeper attachments that tend to spread dirt.
- When unloading sweeper, make sure there is no dust or sediment release.
- After sweeping is finished, properly dispose of sweeper wastes (see below). Never dispose sweep debris into the storm drain systems, catch basins, or waterways.
- Never store street sweepings in areas where stormwater could transport fine materials to the storm drain system or a waterbody.
- If possible, clean catch basins after streets are swept.

Prior to the Start of the Sweeping Season (Spring)

- Train employees on the proper maintenance and operation of equipment and on the proper storage and disposal of street sweepings.
- Ensure all sweeping equipment is in good working order and conduct maintenance as needed (see Equipment Maintenance Section).
- Ensure road crews are familiar with sweeping routes to efficiently cover the entire municipality.

Prior to Leaving the Facility for Sweeping



- Speak with supervisor to determine special circumstances (i.e. rain, priority areas) and to confirm sweeping route.
- Inspect all vehicles. Check fluid levels and fill to proper levels. Ensure lights are in working order. Document any repairs.

Street Sweeping

- Operate all sweepers according to the manufacturer's recommended settings, standards, and procedures.
- While sweeping, drive between the optimal speed limit.
- If spills occur or illegal discharges are seen, report to your supervisor.
- Do not perform sweeping during heavy rainfall.

Upon Return to the Facility

- Provide daily progress reports on the number of miles and names of roads swept to supervisor.
- Wash vehicle following the Vehicles and Equipment Washing SOP (VM-2).
- Before parking any truck or equipment after use, check all fluid levels. Note any minor repairs conducted and other repairs that may be needed. Follow the Vehicle and Equipment Maintenance SOP (VM-1).

Storage, Disposal and Reuse

Storage

- Store separately from catch basin cleaning materials.
- Store street sweepings on an impermeable surface away from areas that receive stormwater runoff.
- Cover street sweeping piles with tarps to prevent rainwater from generating contaminated stormwater.
- Any Town employee handling the street sweepings should wear appropriate personal protective equipment, such as a dust mask, safety goggles, long-sleeved shirts and long pants at all times.

Reuse

Street sweepings may also be used as fill in public ways or as an additive to compost without prior approval from MassDEP provided certain conditions are met:

- Not been collected from Urban Center Roads (defined as local roads in central commercial and retail business districts and industrial and manufacturing areas).
- Used under the road surface or as fill along the side of the road within the public way.
- Not used in residential areas.
- Kept above the level of the groundwater.
- Not used in designated "No Salt Areas".
- Not used within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas.
- Not used within 500 feet of a ground or surface drinking water supply.



Inspection and Maintenance

- Inspect sweepers before sweeping to ensure they are in good working order. Maintain and adjust as necessary.
- Inspect tarp to ensure pile is covered and no tears.
- Inspect erosion controls weekly and after major storms to ensure they are free of tears and sediment buildup. Repair as needed.
- Immediately abate any nuisance conditions (i.e., noise, dust, odor).
- Train employees on proper street sweeping procedures.

Recordkeeping and Reporting

- Use attached Street Sweeping Log to document street sweeping activities.
- Town employees should record:
 - Miles of roadway swept.
 - Tons or cubic yards of street sweeping materials generated.
 - Tons or cubic yards of street sweeping materials disposed of.
 - Tons or cubic yards of street sweeping materials reused as fill.



Street Sweeping Log

Date: _____ Precipitation in the last three days? Yes No

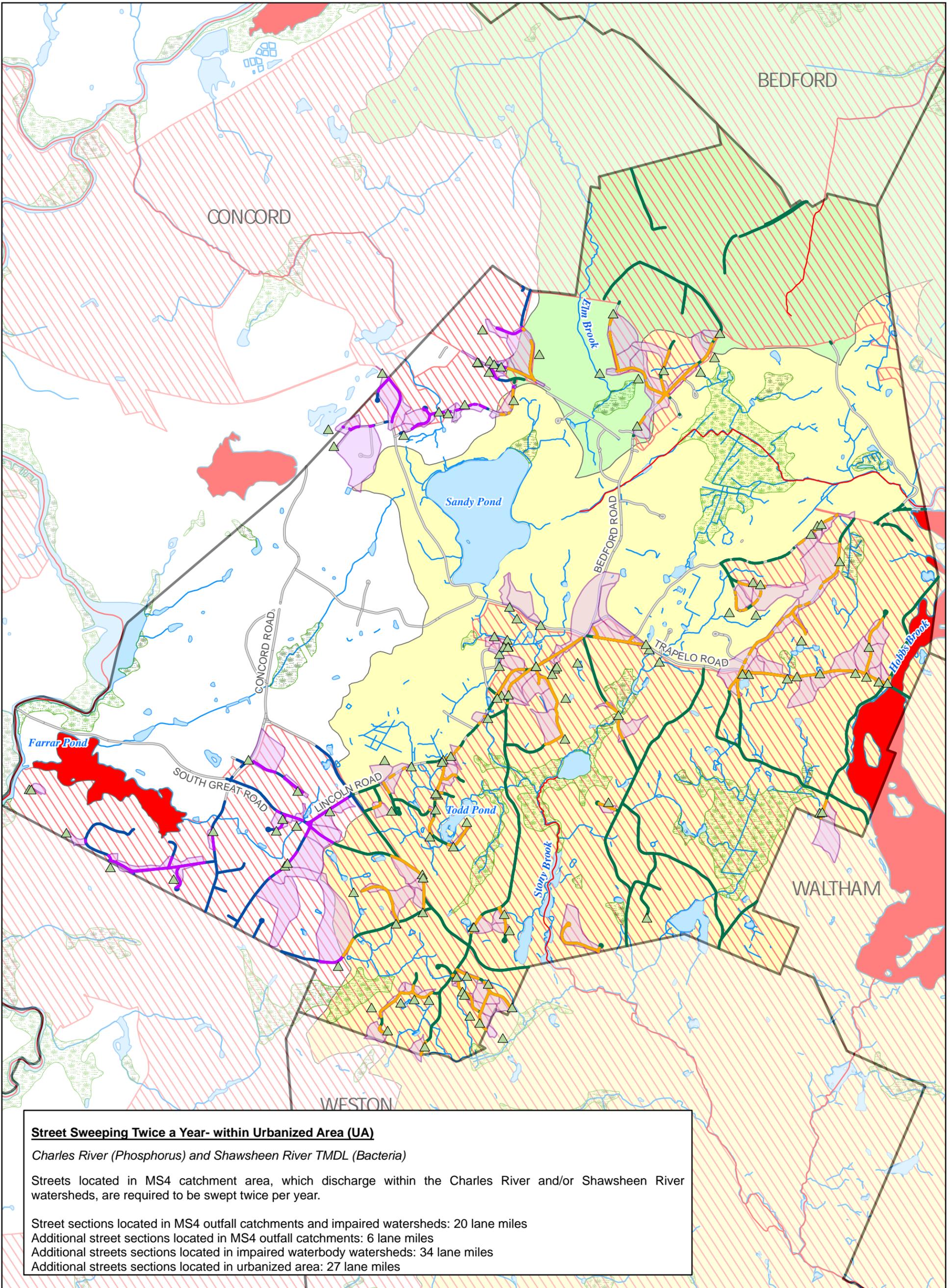
Weather Today: _____

Supervisor/Crew Leader: _____

| Street Swept (Name) | Miles | Observed Potential Sources of Pollution | Volume or Mass of Material Removed | Comments |
|---------------------|-------|--|------------------------------------|----------|
| | | <input type="checkbox"/> None <input type="checkbox"/> Material Storage <input type="checkbox"/> Construction Activity <input type="checkbox"/> Equipment Storage <input type="checkbox"/> Erosion <input type="checkbox"/> Other* | | |
| | | <input type="checkbox"/> None <input type="checkbox"/> Material Storage <input type="checkbox"/> Construction Activity <input type="checkbox"/> Equipment Storage <input type="checkbox"/> Erosion <input type="checkbox"/> Other* | | |
| | | <input type="checkbox"/> None <input type="checkbox"/> Material Storage <input type="checkbox"/> Construction Activity <input type="checkbox"/> Equipment Storage <input type="checkbox"/> Erosion <input type="checkbox"/> Other* | | |
| | | <input type="checkbox"/> None <input type="checkbox"/> Material Storage <input type="checkbox"/> Construction Activity <input type="checkbox"/> Equipment Storage <input type="checkbox"/> Erosion <input type="checkbox"/> Other* | | |
| | | <input type="checkbox"/> None <input type="checkbox"/> Material Storage <input type="checkbox"/> Construction Activity <input type="checkbox"/> Equipment Storage <input type="checkbox"/> Erosion <input type="checkbox"/> Other* | | |
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| | | <input type="checkbox"/> None <input type="checkbox"/> Material Storage <input type="checkbox"/> Construction Activity <input type="checkbox"/> Equipment Storage <input type="checkbox"/> Erosion <input type="checkbox"/> Other* | | |

Total Sediment Accumulated from Route (as weighed at landfill): _____ tons

* Provide additional comments to describe the observations made for the category. Comments should also identify issues that hinder street sweeping progress (i.e., parked cars, obstructions).



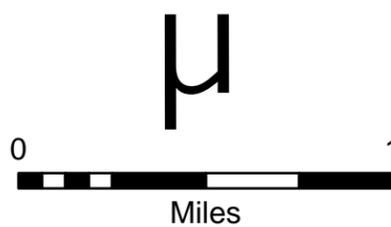
Street Sweeping Twice a Year- within Urbanized Area (UA)
Charles River (Phosphorus) and Shawsheen River TMDL (Bacteria)
 Streets located in MS4 catchment area, which discharge within the Charles River and/or Shawsheen River watersheds, are required to be swept twice per year.

Street sections located in MS4 outfall catchments and impaired watersheds: 20 lane miles
 Additional street sections located in MS4 outfall catchments: 6 lane miles
 Additional streets sections located in impaired waterbody watersheds: 34 lane miles
 Additional streets sections located in urbanized area: 27 lane miles

Legend

- ▲ Stormwater Outfall
 - Outfall Catchment
 - Urbanized Area
 - 303(d) Impaired Stream
 - 303(d) Impaired Waterbody
 - Lake, Pond, Reservoir
 - Wetland, Marsh, Swamp
 - Stream, Brook
 - Charles River Watershed
 - Shawsheen River Watershed
- Street Sweeping Frequency:**
- 2x (required) within UA and Impaired Catchment
 - 2x/yr (optional) within UA and Impaired Watershed
 - 1x (required) within UA and Catchment
 - 1x/yr (optional) within UA

Street Sweeping Map
 Sweeping per Phase II Requirements
 Lincoln, MA



Appendix G

Catch Basin Optimization Plan

Plan for Optimizing Catch Basin Cleaning

Lincoln, MA

June 30, 2019

Prepared For:

Town of Lincoln
16 Lincoln Rd.
Lincoln, MA 01773

Prepared by:

Comprehensive Environmental Inc.
41 Main Street
Bolton, MA 01740



Table of Contents

Plan for Optimizing Catch Basin Cleaning – Lincoln, MA

| | | |
|------------|---|----------|
| 1 | Introduction | 1 |
| 2 | Permit Requirements | 1 |
| 3 | Existing Catch Basin Management Program | 2 |
| 4 | Plans to Refine Catch Basin Cleaning Optimization | 2 |
| 4.1 | Optimization Methodology | 2 |
| 4.2 | Catch Basin Cleaning Standard Operation Procedure (SOP)..... | 3 |
| 4.3 | Catch Basin Cleanings Storage and Disposal..... | 3 |

List of Appendices

- Appendix A. Map of Drainage Infrastructure
- Appendix B. Representative Catch Basins
- Appendix C. Standard Operating Procedures for Catch Basin Cleaning and Inspection

1 Introduction

This Catch Basin Cleaning Optimization Plan has been prepared by Lincoln, MA to address the catch basin inspection, cleaning and maintenance requirements of the United States Environmental Protection Agency's (USEPA's) 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereafter referred to as the "2016 MS4 Permit."

The 2016 MS4 Permit requires the permittee to document its plan for optimizing catch basin cleaning, inspections, or its schedule for gathering information to develop the optimization plan. This plan documents the Town's existing catch basin cleaning program and its plans for gathering additional information to refine its program to meet the requirements of the permit.

2 Permit Requirements

This Catch Basin Cleaning Optimization Plan addresses Section 2.3.7.1.a.iii.2 of the 2016 MS4 Permit (Infrastructure Operations and Maintenance), which includes the following requirements:

- **Establish a schedule** with the goal that the frequency of routine cleaning will ensure that no catch basin at any time will be more than 50 percent full¹;
- **Prioritize** inspection and maintenance for catch basins:
 - located near construction activities². These should be cleaned more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings;
 - discharging to impaired waters where the pollutant of concern is E. coli or enterococcus; and
 - with sumps more than 50% full during consecutive inspections.
- **Establish proper documentation** of catch basin inspections to include:
 - the location and total number of catch basins;
 - the location and total number of catch basins cleaned or inspected; and
 - the total volume or mass of material removed from catch basin
- **Develop an optimization plan** for catch basin cleaning, inspection plans, or a schedule for gathering information to develop the optimization plan in the first annual report and in the SWMP.

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.

² Roadway construction; residential, commercial, or industrial development or redevelopment.

3 Existing Catch Basin Management Program

The Town has 404 catch basins to clean and maintain. Refer to the map in **Appendix A**. The Town hires an outside contractor to complete yearly cleaning of all of these catch basins using a clamshell truck. Typically, half of the catch basins are cleaned in the spring (those on the south side of town) and the remaining half (those on the north side of town) are cleaned in the fall, however, the town does not currently track quantities of sediment removed from each basin. Each of these cleanings takes approximately three weeks to complete. The materials are stored at the Lincoln Department of Public Works (DPW) at 30 Lewis Street in an area that does not drain to wetlands, the MS4, or other sensitive areas. Materials are eventually disposed of at the Fitchburg Landfill.

4 Plans to Refine Catch Basin Cleaning Optimization

4.1 Optimization Methodology

As noted previously, Lincoln already cleans all its catch basins once per year; however, does not currently track catch basin cleaning quantities. Therefore, Lincoln has selected approximately 40 representative catch basins (**Appendix B**) to develop a prioritization schedule. These basins will include varying land use, areas of hills (top, middle, and bottom), topographic locations, and vegetation cover to ensure a wide range of conditions are represented. The depth to sediment in these 40 catch basins will be measured before the spring cleaning has begun, but after the winter sanding has likely finished. Personnel will then measure the top of sediment after the basins are cleaned. Meanwhile, the Town will continue with its yearly cleaning. A spreadsheet will be used to track sediment depth at each location. The catch basin inspection form included with the standard operating procedure (SOP) in **Appendix C** will be used to document data collected during cleaning.

A minimum of two years of data will be collected and evaluated to determine the status of the catch basins and whether the sump was more than half full. The catch basins that are more than 50% full will be evaluated for potential factors that may have contributed to it being 50% full (i.e., smaller sump, nearby construction, surrounding land uses, location in town). The evaluation will be used to identify catch basins that require more frequent inspection and/or cleaning and to develop an optimization plan that prioritizes these structures accordingly.

The Town of Lincoln discharges to the Charles River Watershed and, as part of the requirements for developing Phosphorus Control Plans for TMDL, areas for additional catch basin cleaning will be evaluated as a potential non-structural control measure necessary to support achievement of the phosphorus export milestones outlined in the 2016 Permit. This requirement is to be completed within five years of the permit effective date and this plan will be updated to reflect any areas prioritized for additional catch basin cleaning during the Phosphorus Control Plan development.

4.2 Catch Basin Cleaning Standard Operation Procedure (SOP)

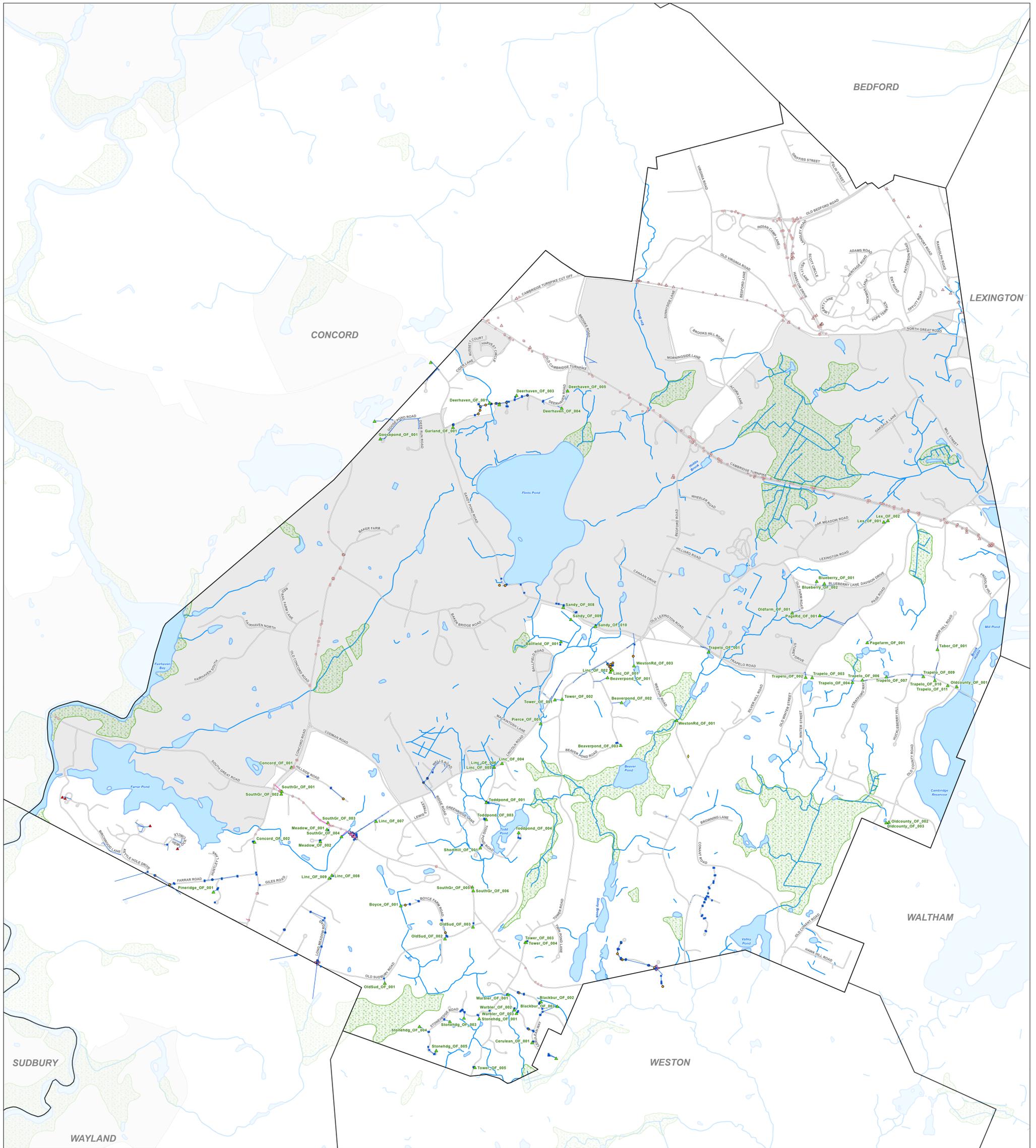
All catch basins will be inspected and cleaned following the standard operating procedures (SOP) provided in **Appendix B**.

4.3 Catch Basin Cleanings Storage and Disposal

Lincoln currently stores catch basin cleanings at the Town DPW until disposal at the Fitchburg Landfill. The Town will explore possible beneficial uses for its collected catch basin cleanings.

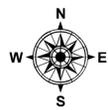
Appendix A

Map of Drainage Infrastructure



Legend

- | | |
|--|---|
| <ul style="list-style-type: none"> ▲ Outfalls ▲ Outfalls ▲ Private Outfalls ■ Catch Basin ▼ Channel ● Drainage Manhole ⊕ Interconnection ○ State Manhole | <ul style="list-style-type: none"> ▭ State Catch Basin — Town Drainage Pipe — State Drainage Pipe — Roads — Roads — Lake, Pond, Reservoir — Wetland, Marsh, Swamp — Stream, Brook — Non-Urban Area |
|--|---|



**Stormwater Infrastructure Map
Lincoln, MA**

Comprehensive
Environmental
Incorporated



Data Sources: CEI, MassGIS, Town of Lincoln

Appendix B

Representative Catch Basins

Appendix C

Standard Operating Procedures for Catch Basin Cleaning and Inspection

MI-2, Catch Basin Cleaning & Inspection

Catch basin cleaning (CBC) is performed to remove sediments from structures before it is washed into waterways. For additional information, see the Town's Catch Basin Cleaning Optimization Plan. All catch basins are cleaned annually, with generally half the catch basins cleaned in the spring (those on the south side of town) and the other half in the fall (those on the north side of town) over an approximate three-week period each time.

Procedures and Practices

1. If possible, notify residents and businesses of catch basin cleaning schedule to restrict parking that could obstruct catch basin cleaning operations.
2. Work upstream to downstream when cleaning catch basins within a drainage network.
3. Clean sediment and trash off grate before removing grate.
4. Inspect the outside of the grate and inside of the catch basin to determine cleaning needs and for structural integrity.
5. Either manually use a shovel to remove accumulated sediments, use a bucket loader to remove accumulated sediments, or use a high pressure washer to clean any remaining material out of the catch basin while capturing the slurry with a vacuum.
6. If necessary, after the catch basin is cleaned, use the rodder of a vacuum truck to clean downstream pipe and pull back sediment that might have entered downstream pipe.
7. After cleaning is finished, properly dispose of collected sediments (see below).
8. Collect and dispose of fluids during catch basin cleaning. Do not discharge fluids to a wetland or waterway.
9. If any suspected illicit discharges are observed or suspected, notify your supervisor.
10. At the end of each day, document location and number of catch basins cleaned, amount of waste collected, and disposal method for all screenings.

Storage and Disposal

Storage

- Lincoln temporarily stores its catch basin cleanings at the Department of Public Works
- Store separately from street sweeping materials.
- Store materials on an impermeable surface away from areas that receive stormwater runoff.
- Cover piles with tarps to prevent rainwater from generating contaminated stormwater.
- Any Town employee handling the street sweepings should wear appropriate personal protective equipment, such as a dust mask, safety goggles, long-sleeved shirts and long pants at all times.

Disposal

Catch basin cleanings must be disposed of at landfills as daily cover, and is currently sent to the Fitchburg-Westminster Landfill. Sampling of the catch basin cleaning materials is not required



unless there is evidence that cleanings were contaminated by a spill or other means. No reuse is allowed without first obtaining a Beneficial Use Determination (BUD) from MassDEP

Inspection and Maintenance

- Clean catch basins to maintain sediment levels in sumps at less than 50% full.
- If catch basins are more than 50% full for two consecutive cleaning events, catch basins should either be cleaned more often or the contributing area should be investigated for sediment sources.
- Inspect catch basins for structural integrity and evidence of illicit discharges during cleaning.
- Inspect tarp to ensure pile is covered and no tears.
- Immediately abate any nuisance conditions (i.e., noise, dust, odor).
- Train employees on proper CBC procedures.

Recordkeeping and Reporting

- Use attached Catch Basin Inspection Form when inspecting catch basins. Town employees should record:
 - Number of catch basins inspected.
 - Number of catch basins cleaned.
 - Log of catch basins cleaned or inspected.
 - Tons or cubic yards of catch basin cleaning materials generated.
- Use attached Catch Basin Maintenance/Repair Log to document CBC activities.



Catch Basin Inspection Procedures

Option 1: Inspection during Cleaning

1. Clean sediment and trash off of grate.
2. Remove grate.
3. Fill out **Catch Basin Inspection Form** with basin-specific information:
 - **Before cleaning:**
 - Do a visual inspection of outside of grate.
 - Do a visual inspection of the inside of the catch basin to determine cleaning needs and structural issues.
 - Measure depth from rim of catch basin to top of sediment.
 - Measure depth from rim of catch basin to the top of the outlet pipe.
 - Take photo of catch basin.
 - **Clean catch basin:**
 - For manual removal, place removed material in a location protected from potential runoff and place cleanings in a vehicle for transport to designated disposal area.
 - OR use a high-powered vac truck to remove sediment.
 - **After cleaning:**
 - Measure depth from rim to bottom of catch basin.
 - Measure depth of sump (outlet pipe to bottom of catch basin).
 - Note if the catch basin is more than 50% full with sediment.
 - Note if the catch basin requires maintenance or if there are pollutants present.
 - Take photo of catch basin.
4. If any illicit discharges are observed or suspected, notify supervisor.

Option 2: Interim Inspection between Cleaning Cycles

1. Clean sediment and trash off grate.
2. Remove grate.
3. Fill out **Catch Basin Inspection Form** with basin-specific information:
 - Do a visual inspection of outside of grate.
 - Do a visual inspection of the inside of the catch basin to determine cleaning needs and structural issues.
 - Measure depth from rim of catch basin to top of sediment.
 - Using sump depth collected during previous cleaning, note if the catch basin is more than 50% full with sediment.
 - Note if the catch basin requires maintenance or if there are pollutants present.
4. If any illicit discharges are observed or suspected, notify supervisor.



Catch Basin Inspection Form

| Inspection Information | | | |
|--|---|--|--------------------------|
| Catch Basin ID | | | |
| Street Location | | GPS Location | |
| Inspector's Name | | | |
| Date of Inspection | | Time of Inspection | |
| Weather (circle) | Dry | Light Rain | Heavy Rain Snow |
| Catch Basin Information | | | |
| Location | Surface Type | Grate | |
| <input type="checkbox"/> Road/Curb <input type="checkbox"/> Alley <input type="checkbox"/> Ditch <input type="checkbox"/> Parking Lot <input type="checkbox"/> Driveway <input type="checkbox"/> Sidewalk Other: _____ | <input type="checkbox"/> Asphalt <input type="checkbox"/> Gravel <input type="checkbox"/> Concrete <input type="checkbox"/> Grass/Dirt Other: _____ | ___ inches x ___ inches Material: _____ Shape: _____ | |
| Catch Basin Condition | | | |
| CB Damage: No Yes | Comment: | | |
| | Materials (circle) | | Condition (circle) |
| Grate | Cast Iron | Brick Concrete Aluminum Fiberglass | Poor Fair Good Excellent |
| Frame | Cast Iron | Brick Concrete Aluminum Fiberglass | Poor Fair Good Excellent |
| Chimney | Cast Iron | Brick Concrete Aluminum Fiberglass | Poor Fair Good Excellent |
| Walls | Cast Iron | Brick Concrete Aluminum Fiberglass | Poor Fair Good Excellent |
| Trap/Hood | Cast Iron | Brick Concrete Aluminum Fiberglass | Poor Fair Good Excellent |
| Sump | Cast Iron | Brick Concrete Aluminum Fiberglass | Poor Fair Good Excellent |
| Sediment Depth and IDDE (inches) | | | |
| A. Depth from Rim to Top of Sediment: _____ B. Depth from Rim to Bottom of Basin (after vac): _____ C. Sump Depth: _____ D. Depth of Sediment (B-A): _____ E. More than 50% Full of Sediment? (D/C): _____ | | Check those Present: ___ Sanitary Waste/Smell ___ Excessive Sediment ___ Oil Sheen ___ Floatables/Trash ___ Pet Waste: Other: _____ Potential Source: _____ | |
| CB Cleaned? No Yes Suspected illicit discharge? No Yes | | | |



Appendix H

List of Stormwater BMPs and Inspection/Maintenance Records



STORMWATER INSPECTION REPORT

To: Mr. Chris Bibbo, Lincoln DPW Director

From: Nick Cristofori, P.E., Comprehensive Environmental Inc.

Date: June 12, 2020

Locations: Trapelo Road (3), Pierce Park (1), Old Bedford Road (1)

Town: Lincoln, MA

Inspectors: Sara Nelson, CEI

Inspection Dates: June 3, 2020

Under the Environmental Protection Agency’s (EPA’s) 2016 National Pollutant Discharge and Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit, regulated communities such as Lincoln are required to annually inspect stormwater Best Management Practices (BMPs) within the regulated Urbanized Area (UA) and maintain as needed. In response, Comprehensive Environmental Inc. (CEI) performed an inspection of stormwater BMPs at the identified locations on June 3, 2020 to evaluate general conditions and document recommended maintenance items for follow-up action in order to meet permit requirements.

Inspections

The Town of Lincoln DPW identified 5 different BMPs that required inspections in order to meet permit requirements and provided design plans for each site. BMP locations are identified by street name and BMP type, with locations shown on a town-wide GIS map. Table 1 below details the locations and individual BMPs that were inspected, while Table 2 summarizes maintenance needs for each location. Table 3 at the end of the report provides additional inspection results and details of maintenance needs. BMP inspection results are detailed in the attached inspection sheets attached to this report, along with representative photo documentation.

At the time of the inspections, the weather was approximately 55 to 70 degrees and sunny. Weather over a three-day period leading up to June 3rd was between 50 to 75 degrees with light rain. Sara Nelson of CEI performed the inspections and noted the following general condition and maintenance needs:

Table 1 – Stormwater Infrastructure Inspected

| BMP ID | Location | Stormwater BMP Type | Overall Condition | Requires Maintenance |
|--------|------------------|---------------------|-------------------|----------------------|
| TRSB-1 | Trapelo Road | Settling Basin | Fair | Yes (minor) |
| TRSB-2 | Trapelo Road | Settling Basin | Fair | Yes (minor) |
| OBSB-1 | Old Bedford Road | Detention Basin | Fair | Yes (minor) |
| PPSB-1 | Pierce Park | Sediment Basin | Fair | Yes (minor) |
| TRSB-3 | Trapelo Road | Settling Basin | Good | No |



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Recommendations

As noted previously, the inspected BMPs are all located within the regulated UA and/or discharge to waters of the United States. One BMP was in good operating order while the others are in fair condition and require minor maintenance as noted on the attached inspection sheets. Minor maintenance generally includes removal of plant material buildup, sediment vacuuming, trimming back or removal of vegetation, curb or edge of road maintenance, and general landscaping.

Table 2 below provides a brief summary of maintenance requirements for each BMP, while Table 3 provides additional information on inspection results. Based on CEI's inspections, the maintenance items identified in Table 2 below should be completed in order to improve BMP functionality.

Table 2 – BMP Maintenance Recommendations

| BMP ID / Location | Recommendations |
|---------------------------|--|
| TRSB-1 / Trapelo Road | <ul style="list-style-type: none">• Repair erosion and stabilize with fabric and stone armoring |
| TRSB-2 / Trapelo Road | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove sediment within the infiltration area and scarify bottom surface• Jet and clean inlet pipe• Repair erosion and stabilize with fabric and stone armoring |
| OBSB-1 / Old Bedford Road | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Repair erosion and stabilize with fabric or stone armoring• Cut and remove vegetation on side slopes• Repair erosion and stabilize with fabric and stone armoring• Remove and replace vegetation as needed to maintain function |
| PPSB-1 / Pierce Park | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Jet and clean inlet pipe• Cut and remove vegetation on side slopes• Repair erosion and stabilize with fabric and stone armoring• Remove dead trees to restore capacity |
| TRSB-3 / Trapelo Road | <ul style="list-style-type: none">• N/A, no maintenance required |

If you have any further questions or would like additional information, please feel free to contact me at 800.725.2550 x303 or ncristofori@ceiengineers.com. Thank you.

Nick Cristofori, P.E.
Principal, Project Manager

Attachments:

- Stormwater inspection reports and photograph



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Table 3 – Stormwater Infrastructure Inspected and Maintenance Recommendations

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|--------------------------------------|--|--|
| BMPs requiring follow up action. | | | | | |
| TRSB-1 Trapelo Road | Settling Basin | 6/3/2020 | Sediment accumulation. | Less than ½ depth from bottom to invert. | Inspect annually. Remove excess sediment. |
| | | | Debris accumulation. | Accumulation <1/2 depth from BMP bottom to lowest invert pipe. | No immediate actions. Inspect annually and remove debris to maintain capacity. |
| | | | Bottom of infiltration area clogged. | Less than ¾ of bottom area covered by sediment. | Inspect annually. Remove excess sediment. |
| | | | Clogged inlet. | Any portion of inlet clogged less than ¼ capacity. | Inspect annually. Remove excess sediment. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |
| TRSB-2 Trapelo Road | Settling Basin | 6/3/2020 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Debris accumulation. | Accumulation <1/2 depth from BMP bottom to lowest invert pipe. | No immediate actions. Inspect annually and remove debris to maintain capacity. |
| | | | Bottom of infiltration area clogged. | Greater than ¾ of bottom area covered by sediment. | Remove accumulation / clean-out underdrains / scarify bottom surface. |
| | | | Clogged inlet. | Any portion of pipe clogged >1/4 capacity. | Jet and clean pipe. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |



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| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|---|--|---|
| BMPs requiring follow up action. | | | | | |
| OBSB-1 Old Bedford Road | Detention Basin | 6/3/2020 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Debris accumulation. | Accumulation <1/2 depth from BMP bottom to lowest invert pipe. | No immediate actions. Inspect annually and remove debris to maintain capacity. |
| | | | Overgrown woody vegetation on earthen embankment. | Woody vegetation covering <50% embankment surface area. | No immediate action, inspect annually. |
| | | | Animal burrows/depressions on earthen embankment. | Hole/depression <6" in any dimension. | Repair erosion with compacted fill and stabilize with fabric or stone armoring. |
| | | | Overgrown vegetation on side slopes and bottom. | Vegetation impacting function/capacity. | Cut and remove vegetation on side slopes as needed to maintain function and storage capacity. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |
| | | | Animal burrows/depressions on side slopes and bottom. | Hole/depression not causing excess sedimentation or undermining. | No immediate action. Inspect annually. |
| | | | Dead Vegetation. | Dead vegetation impacting function. | Remove and replace vegetation as needed to maintain function. |



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| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|---|--|---|
| BMPs requiring follow up action. | | | | | |
| PPSB-1 Pierce Park | Sediment Basin | 6/3/2020 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Debris accumulation. | Accumulation <1/2 depth from BMP bottom to lowest invert pipe. | No immediate actions. Inspect annually and remove debris to maintain capacity. |
| | | | Clogged inlet. | Any portion of pipe clogged >1/4 capacity. | Jet and clean pipe. |
| | | | Overgrown vegetation on side slopes and bottom. | Vegetation impacting function/capacity. | Cut and remove vegetation on side slopes as needed to maintain function and storage capacity. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |
| | | | Dead Vegetation. | Dead vegetation impacting function. | Remove dead trees to restore capacity. |
| BMPs requiring routine inspection with no immediate follow up action required. | | | | | |
| TRSB-3 Trapelo Road | Settling Basin | 6/3/2020 | Sediment accumulation. | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| | | | Debris accumulation. | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| | | | Overgrown vegetation on side slopes and bottom. | Vegetation not impacting function/capacity. | No immediate action. Inspect annually. |
| | | | Erosion on side slopes or bottom. | Erosion not causing excess sedimentation or undermining. | No immediate action. Inspect annually. |



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| Structural Stormwater BMP Inspection Checklist | | | | | | | | | | |
|---|--|--|--|---|--|---|--|---|---|--|
| Instructions: complete for all stormwater BMPs. | | | | | | | | | | |
| Town: <u>Lincoln</u> | | | Location: <u>Trapelo Road</u> | | | | | | | |
| Date: <u>6/3/2020</u> | | | Weather Today: <u>Dry</u> | | | | | | | |
| Inspector Name: <u>Sara Nelson</u> | | | Weather over past 72 hours: <u>Light Rain</u> | | | | | | | |
| BMP ID / Location | Type of BMP | Maint. Required? | Sediment Accumulation | Deposits | Structural Condition | Erosibility | Vegetation | Inlet Pipes | Outlet Pipes | Comments |
| TRSB-1 Settling Basin | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input checked="" type="checkbox"/> Other* - Settling Basin | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input checked="" type="checkbox"/> Slight build up <input type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input checked="" type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input checked="" type="checkbox"/> Channels <input type="checkbox"/> Depressions <input checked="" type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> No Distress <input type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | Some sediment and vegetative debris buildup. Inlet and bottom are slightly clogged. Significant erosion in basin and channeling in spillway area. |
| TRSB-2 Settling Basin | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input checked="" type="checkbox"/> Other* - Settling Basin | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input type="checkbox"/> Slight build up <input checked="" type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input checked="" type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input type="checkbox"/> Channels <input type="checkbox"/> Depressions <input checked="" type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> No Distress <input type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | Significant sedimentation throughout causing the inlet to be 50% clogged and likely causing the bottom of the basin to be clogged. Erosion on bottom and side slopes of basin causing sedimentation. |
| TRSB-3 Settling Basin | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input checked="" type="checkbox"/> Other* - Settling Basin | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | <input type="checkbox"/> None <input checked="" type="checkbox"/> Slight build up <input type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input checked="" type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input type="checkbox"/> Channels <input type="checkbox"/> Depressions <input checked="" type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> No Distress <input type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input checked="" type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | Minimal sediment and vegetative debris buildup. Starting to become overgrown. Minimal erosion in basin. |
| | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input type="checkbox"/> Other* | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input type="checkbox"/> Slight build up <input type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input type="checkbox"/> Channels <input type="checkbox"/> Depressions <input type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> No Distress <input type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | |
| | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input type="checkbox"/> Other* | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input type="checkbox"/> Slight build up <input type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input type="checkbox"/> Channels <input type="checkbox"/> Depressions <input type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> No Distress <input type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | |
| | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input type="checkbox"/> Other* | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input type="checkbox"/> Slight build up <input type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input type="checkbox"/> Channels <input type="checkbox"/> Depressions <input type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> No Distress <input type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | |

* Provide additional comments to describe the observations made for the category.



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| Structural Stormwater BMP Inspection Checklist | | | | | | | | | | |
|---|--|--|--|---|--|--|---|---|---|--|
| Instructions: complete for all stormwater BMPs. | | | | | | | | | | |
| Town: <u>Lincoln</u> | | Location: <u>Pierce Park</u> | | | | | | | | |
| Date: <u>6/3/2020</u> | | Weather Today: <u>Dry</u> | | | | | | | | |
| Inspector Name: <u>Sara Nelson</u> | | Weather over past 72 hours: <u>Light Rain</u> | | | | | | | | |
| BMP ID / Location | Type of BMP | Maint. Required? | Sediment Accumulation | Deposits | Structural Condition | Erosibility | Vegetation | Inlet Pipes | Outlet Pipes | Comments |
| Pierce Park | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input checked="" type="checkbox"/> Other* - Sediment Basin | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input type="checkbox"/> Slight build up <input checked="" type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input checked="" type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input checked="" type="checkbox"/> Channels <input type="checkbox"/> Depressions <input type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> No Distress <input checked="" type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input checked="" type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | Significant sedimentation causing buildup around inlet and preventing inflow. Some standing water around inlet. Significant overgrown vegetation and erosion causing channeling. Some dead/fallen trees in and around basin. |
| | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input type="checkbox"/> Other* | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input type="checkbox"/> Slight build up <input type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input type="checkbox"/> Channels <input type="checkbox"/> Depressions <input type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> No Distress <input type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | |
| | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input type="checkbox"/> Other* | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input type="checkbox"/> Slight build up <input type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input type="checkbox"/> Channels <input type="checkbox"/> Depressions <input type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> No Distress <input type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | |
| | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input type="checkbox"/> Other* | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input type="checkbox"/> Slight build up <input type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input type="checkbox"/> Channels <input type="checkbox"/> Depressions <input type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> No Distress <input type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | |
| | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input type="checkbox"/> Other* | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input type="checkbox"/> Slight build up <input type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input type="checkbox"/> Channels <input type="checkbox"/> Depressions <input type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> No Distress <input type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | |

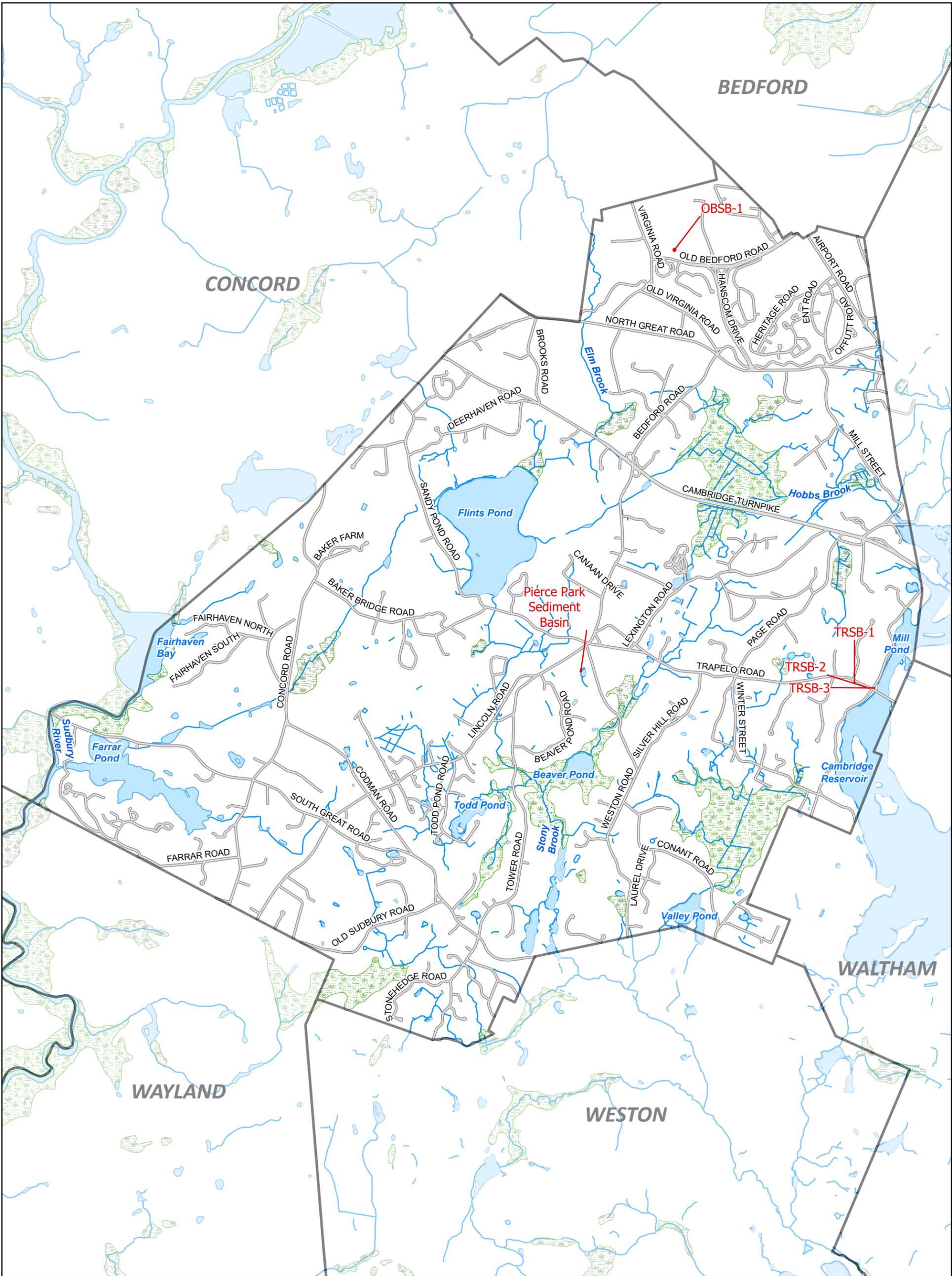
* Provide additional comments to describe the observations made for the category.



STORMWATER INSPECTION REPORT

| Structural Stormwater BMP Inspection Checklist | | | | | | | | | | |
|---|---|--|--|---|--|--|--|---|---|---|
| Instructions: complete for all stormwater BMPs. | | | | | | | | | | |
| Town: <u>Lincoln</u> | | | Location: <u>Old Bedford Road</u> | | | | | | | |
| Date: <u>6/3/2020</u> | | | Weather Today: <u>Dry</u> | | | | | | | |
| Inspector Name: <u>Sara Nelson</u> | | | Weather over past 72 hours: <u>Light Rain</u> | | | | | | | |
| BMP ID / Location | Type of BMP | Maint. Required? | Sediment Accumulation | Deposits | Structural Condition | Erosibility | Vegetation | Inlet Pipes | Outlet Pipes | Comments |
| OBSB-1 Old Bedford Road | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input checked="" type="checkbox"/> Other* - Detention Basin | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input checked="" type="checkbox"/> Slight build up <input type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input checked="" type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input checked="" type="checkbox"/> Channels <input checked="" type="checkbox"/> Depressions <input checked="" type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> No Distress <input checked="" type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input checked="" type="checkbox"/> Overgrown <input checked="" type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | Some sedimentation and vegetative debris. Woody vegetation growing on embankment. Some erosion and animal burrows on embankment and side slopes. Significant channeling from inlet to outlet. Some phragmites. Entire basin is overgrown, blocking visibility/access. Some dead trees and other vegetative debris should be cleared from basin. |
| | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input type="checkbox"/> Other* | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input type="checkbox"/> Slight build up <input type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input type="checkbox"/> Channels <input type="checkbox"/> Depressions <input type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> No Distress <input type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | |
| | <input type="checkbox"/> Forebay <input type="checkbox"/> Det. / Infil. Pond <input type="checkbox"/> Swale <input type="checkbox"/> Rain Garden <input type="checkbox"/> Underground System <input type="checkbox"/> Leaching Catch Basin <input type="checkbox"/> Proprietary Separator <input type="checkbox"/> Other* | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> None <input type="checkbox"/> Slight build up <input type="checkbox"/> Heavy build up _____ Depth (in.) | <input type="checkbox"/> None <input type="checkbox"/> Grease/Oil <input type="checkbox"/> Grass/Compost <input type="checkbox"/> Trash/Debris <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good <input type="checkbox"/> Corroded <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> None <input type="checkbox"/> Channels <input type="checkbox"/> Depressions <input type="checkbox"/> Bank Erosion <input type="checkbox"/> Displaced Riprap <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> No Distress <input type="checkbox"/> Distressed <input type="checkbox"/> Sparse <input type="checkbox"/> Overgrown <input type="checkbox"/> Invasive Plants <input type="checkbox"/> Other* | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | <input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Exposed Steel <input type="checkbox"/> Corroded | |
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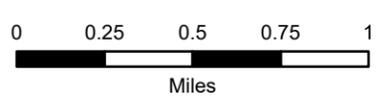


Legend

Stormwater BMP Map

Lincoln, MA

-  BMP
-  Roads
-  Lake, Pond, Reservoir
-  Wetland, Marsh, Swamp
-  Stream, Brook



Data Sources: MassGIS, Town of Lincoln, CEI



STORMWATER INSPECTION REPORT

To: Mr. Chris Bibbo, Lincoln DPW Director
From: Nick Cristofori, P.E., Comprehensive Environmental Inc.
Date: May 24, 2021
Locations: Trapelo Road (3), Pierce Park (1), Old Bedford Road (1)
Town: Lincoln, MA
Inspectors: Iain Church and Allison Huffman, CEI
Inspection Dates: May 6, 2021

Under the Environmental Protection Agency’s (EPA’s) 2016 National Pollutant Discharge and Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit, regulated communities such as Lincoln are required to annually inspect stormwater Best Management Practices (BMPs) within the regulated Urbanized Area (UA) and maintain as needed. In response, Comprehensive Environmental Inc. (CEI) performed an inspection of stormwater BMPs at the identified locations on May 6, 2021 to evaluate general conditions and document recommended maintenance items for follow-up action in order to meet permit requirements.

Inspections

The Town of Lincoln DPW identified 5 different BMPs that required inspections in order to meet permit requirements and provided design plans for each site. BMP locations are identified by street name and BMP type, with locations shown on a town-wide GIS map. Table 1 below details the locations and individual BMPs that were inspected, while Table 2 summarizes maintenance needs for each location. Table 3 at the end of the report provides additional inspection results and details of maintenance needs. BMP inspection results are detailed in the attached inspection sheets attached to this report, along with representative photo documentation.

At the time of the inspections, the weather was approximately 50 to 60 degrees and sunny. Weather over a three-day period leading up to May 6th was between 45 to 60 degrees with rain on May 4th. Iain Church and Allison Huffman of CEI performed the inspections and noted the following general condition and maintenance needs:

Table 1 – Stormwater Infrastructure Inspected

| BMP ID | Location | Stormwater BMP Type | Overall Condition | Requires Maintenance |
|--------|------------------|---------------------|-------------------|----------------------|
| TRSB-1 | Trapelo Road | Settling Basin | Fair | Yes (minor) |
| TRSB-2 | Trapelo Road | Settling Basin | Fair | Yes (minor) |
| TRSB-3 | Trapelo Road | Settling Basin | Good | No |
| OBSB-1 | Old Bedford Road | Detention Basin | Fair | Yes (minor) |
| PPSB-1 | Pierce Park | Sediment Basin | Fair | Yes (minor) |



STORMWATER INSPECTION REPORT

Recommendations

As noted previously, the inspected BMPs are all located within the regulated UA and/or discharge to waters of the United States. One BMP was in good operating order while the others are in fair condition and require minor maintenance as noted on the attached inspection sheets. Minor maintenance generally includes removal of plant material buildup, sediment vacuuming, trimming back or removal of vegetation, and general landscaping.

Table 2 below provides a brief summary of maintenance requirements for each BMP, while Table 3 provides additional information on inspection results. Based on CEI's inspections, the maintenance items identified in Table 2 below should be completed in order to improve BMP functionality.

Table 2 – BMP Maintenance Recommendations

| BMP ID / Location | Recommendations |
|---------------------------|---|
| TRSB-1 / Trapelo Road | <ul style="list-style-type: none">• Repair erosion and stabilize with fabric and stone armoring• Remove sediment within the infiltration area and scarify bottom surface |
| TRSB-2 / Trapelo Road | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove sediment within the infiltration area and scarify bottom surface• Repair erosion and stabilize with fabric and stone armoring |
| TRSB-3 / Trapelo Road | <ul style="list-style-type: none">• N/A, no maintenance required |
| OBSB-1 / Old Bedford Road | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove and replace vegetation as needed to maintain function• Remove and dispose of invasive species in accordance with regulations |
| PPSB-1 / Pierce Park | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove dead trees to restore capacity• Remove and dispose of invasive species in accordance with regulations |

If you have any further questions or would like additional information, please feel free to contact me at 800.725.2550 x303 or ncristofori@ceiengineers.com. Thank you.

Nick Cristofori, P.E.
Principal, Project Manager

Attachments:

- BMP map
- Stormwater inspection reports and photograph



STORMWATER INSPECTION REPORT

Table 3 – Stormwater Infrastructure Inspected and Maintenance Recommendations

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|--------------------------------------|--|---|
| BMPs requiring follow up action. | | | | | |
| TRSB-1 Trapelo Road | Settling Basin | 5/6/2021 | Sediment accumulation. | Less than ½ depth from bottom to invert. | Inspect annually. Remove excess sediment. |
| | | | Bottom of infiltration area clogged. | Greater than ¾ of bottom area covered by sediment. | Remove accumulation / clean-out underdrains / scarify bottom surface. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |
| TRSB-2 Trapelo Road | Settling Basin | 5/6/2021 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Bottom of infiltration area clogged. | Greater than ¾ of bottom area covered by sediment. | Remove accumulation / clean-out underdrains / scarify bottom surface. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |



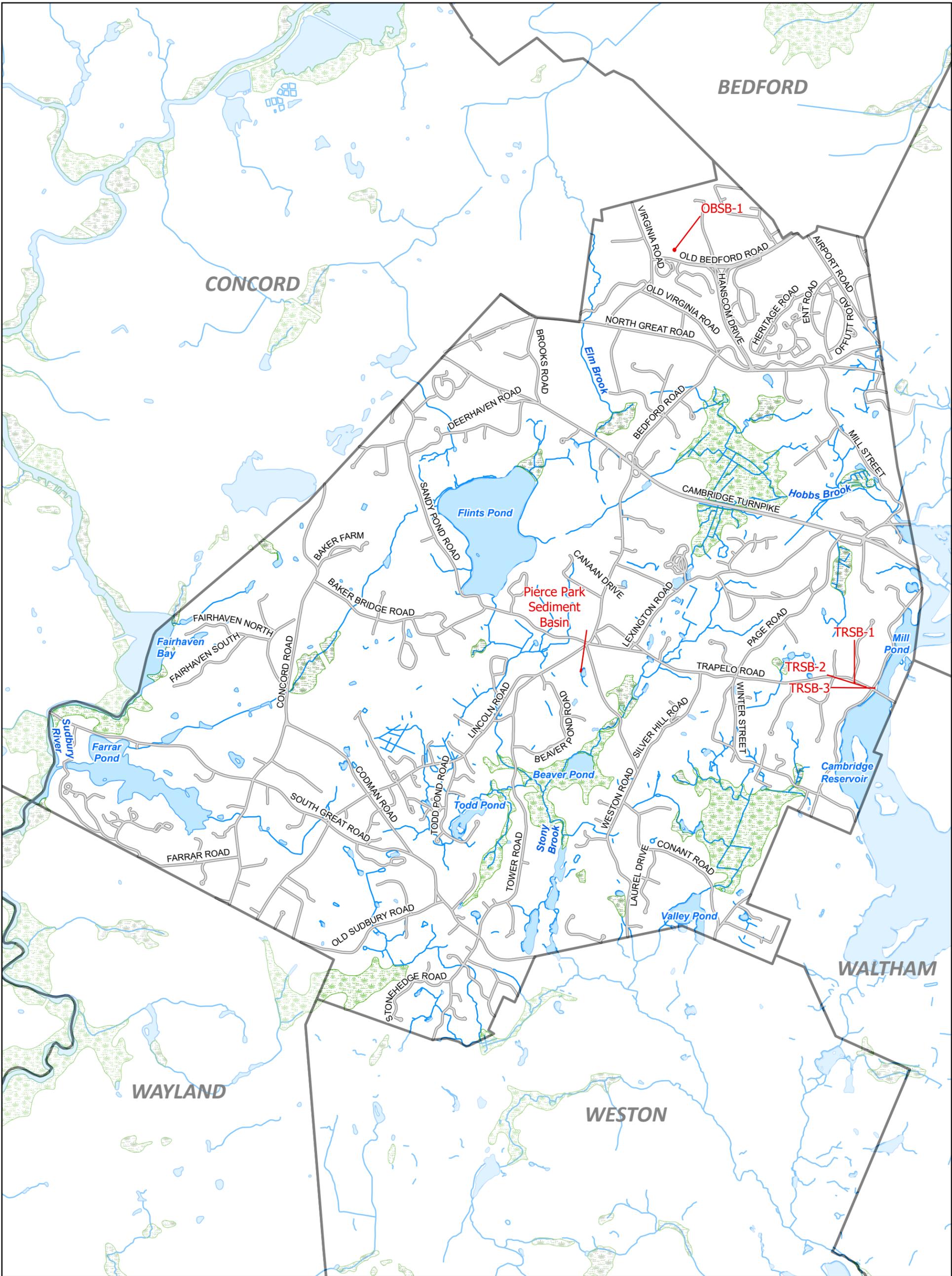
STORMWATER INSPECTION REPORT

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|---|--|--|
| BMPs requiring follow up action. | | | | | |
| OBSB-1 Old Bedford Road | Detention Basin | 5/6/2021 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Overgrown woody vegetation on earthen embankment. | Woody vegetation covering <50% embankment surface area. | No immediate action. inspect annually. |
| | | | Overgrown vegetation on side slopes and bottom. | Vegetation not impacting function/capacity. | No immediate action. inspect annually. |
| | | | Erosion on side slopes and bottom. | Erosion not causing excess sedimentation. | No immediate action. inspect annually. |
| | | | Hole/depressions on side slopes and bottom. | Hole/depression not causing excess sedimentation or undermining of BMP components. | No immediate action. inspect annually. |
| | | | Clogged outlet. | Any portion of pipe clogged <1/4 capacity. | No immediate action. Inspect annually. |
| | | | Presence of Invasive Species. | Phragmites and multiflora rose present in basin bottom. | Remove and dispose of invasives in accordance with regulations. |
| | | | Dead Vegetation. | Dead vegetation impacting function. | Remove and replace vegetation as needed to maintain function. |



STORMWATER INSPECTION REPORT

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|-------------------------------|---|--|
| BMPs requiring follow up action. | | | | | |
| PPSB-1 Pierce Park | Sediment Basin | 5/6/2021 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Debris accumulation. | Accumulation <1/2 depth from BMP bottom to lowest invert pipe. | No immediate actions. Inspect annually and remove debris to maintain capacity. |
| | | | Clogged outlet. | Any portion of pipe clogged <1/4 capacity. | No immediate action. Inspect annually. |
| | | | Structural Damage. | Missing rocks from inlet headwall. | No immediate action. Inspect annually. |
| | | | Presence of Invasive Species. | Japanese Knotweed present along banks and contributing to debris buildup at outlet. | Remove and dispose of invasives in accordance with regulations. |
| | | | Dead Vegetation. | Dead vegetation impacting function. | Remove and replace vegetation as needed to maintain function. |
| BMPs requiring routine inspection with no immediate follow up action required. | | | | | |
| TRSB-3 Trapelo Road | Settling Basin | 5/6/2021 | Sediment accumulation. | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |

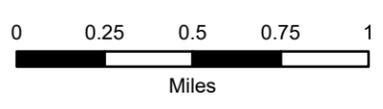


Legend

Stormwater BMP Map

Lincoln, MA

-  BMP
-  Roads
-  Lake, Pond, Reservoir
-  Wetland, Marsh, Swamp
-  Stream, Brook



Data Sources: MassGIS, Town of Lincoln, CEI



STORMWATER BMP INSPECTION REPORT

To: Mr. Chris Bibbo - DPW Director, Town of Lincoln

From: Nick Cristofori, P.E., Comprehensive Environmental Inc.

Date: May 31, 2022

Locations: Trapelo Road (3), Pierce Park (1), Old Bedford Road (1)

Town: Lincoln, MA

Inspectors: Kevin Barbara & Danica Cucchi, CEI

Inspection Dates: April 27, 2022

Under the Environmental Protection Agency’s (EPA’s) 2016 National Pollutant Discharge and Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit, regulated communities such as Lincoln are required to annually inspect stormwater Best Management Practices (BMPs) within the regulated Urbanized Area (UA) and maintain as needed. In response, Comprehensive Environmental Inc. (CEI) performed an inspection of stormwater BMPs at the identified locations on April 27, 2022 to evaluate general conditions and document recommended maintenance items for follow-up action in order to meet permit requirements.

Inspections

The Town of Lincoln DPW identified 5 different BMPs that required inspections in order to meet permit requirements and provided design plans for each site. BMP locations are identified by street name and BMP type, with locations shown on a town-wide GIS map. Table 1 below details the locations and individual BMPs that were inspected, while Table 2 summarizes maintenance needs for each location. Table 3 at the end of the report provides additional inspection results and details of maintenance needs. BMP inspection results are detailed in the attached inspection sheets attached to this report, along with representative photo documentation.

At the time of the inspections, the weather was approximately 50 to 55 degrees and partly sunny. Weather over a three-day period leading up to April 27th was between 40 to 55 degrees with light rain on April 26th. Kevin Barbara and Danica Cucchi of CEI performed the inspections and noted the following general condition and maintenance needs:

Table 1 – Stormwater Infrastructure Inspected

| BMP ID | Location | Stormwater BMP Type | Overall Condition | Requires Maintenance |
|--------|------------------|---------------------|-------------------|----------------------|
| TRSB-1 | Trapelo Road | Settling Basin | Poor | Yes |
| TRSB-2 | Trapelo Road | Settling Basin | Poor | Yes (minor) |
| TRSB-3 | Trapelo Road | Settling Basin | Good | No |
| OBSB-1 | Old Bedford Road | Detention Basin | Fair | Yes (minor) |
| PPSB-1 | Pierce Park | Grass Swale | Fair | Yes (minor) |



STORMWATER BMP INSPECTION REPORT

Recommendations

As noted previously, the inspected BMPs are all located within the regulated UA and/or discharge to waters of the United States. One BMP was in good operating order while the others are in fair condition and require minor maintenance as noted on the attached inspection sheets. Minor maintenance generally includes removal of plant material buildup, sediment vacuuming, trimming back or removal of vegetation, and general landscaping.

Table 2 below provides a brief summary of maintenance requirements for each BMP, while Table 3 provides additional information on inspection results. Based on CEI's inspections, the maintenance items identified in Table 2 below should be completed in order to improve BMP functionality.

Table 2 – BMP Maintenance Recommendations

| BMP ID / Location | Recommendations |
|---------------------------|---|
| TRSB-1 / Trapelo Road | <ul style="list-style-type: none">• Repair erosion and stabilize with fabric and stone armoring• Remove sediment accumulation at outlet• Remove sediment within the infiltration area and scarify bottom surface |
| TRSB-2 / Trapelo Road | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove sediment within the infiltration area and scarify bottom surface• Repair erosion and stabilize with fabric and stone armoring |
| OBSB-1 / Old Bedford Road | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove and replace vegetation as needed to maintain function• Remove and dispose of invasive species in accordance with regulations |
| PPSB-1 / Pierce Park | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove dead trees to restore capacity• Remove and dispose of invasive species in accordance with regulations |

Locations should be maintained as outlined above. Inspections should continue annually with the next inspection occurring in spring 2023. If additional town-owned BMPs are identified, they should also be maintained as needed and inspected annually. BMP maps and inventories should also be updated to reflect all BMPs, and as-built plans retained on file where possible to aid in future inspections.

If you have any further questions or would like additional information, please feel free to contact me at 800.725.2550 x303 or ncristofori@ceiengineers.com. Thank you.

Nick Cristofori, P.E.
Principal, Project Manager

Attachments:

- BMP map
- Stormwater inspection reports and photograph



BMP STORMWATER INSPECTION REPORT

Table 3 – Stormwater Infrastructure Inspected and Maintenance Recommendations

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|--------------------------------------|--|--|
| BMPs requiring follow up action. | | | | | |
| TRSB-1 Trapelo Road | Settling Basin | 4/27/2022 | Clogged outlet piping. | More than ½ portion clogged. | Inspect annually. Remove clogged outlet. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |
| TRSB-2 Trapelo Road | Settling Basin | 4/27/2022 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Bottom of infiltration area clogged. | Greater than ¾ of bottom area covered by sediment. | Remove accumulation / clean-out underdrains / scarify bottom surface. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |



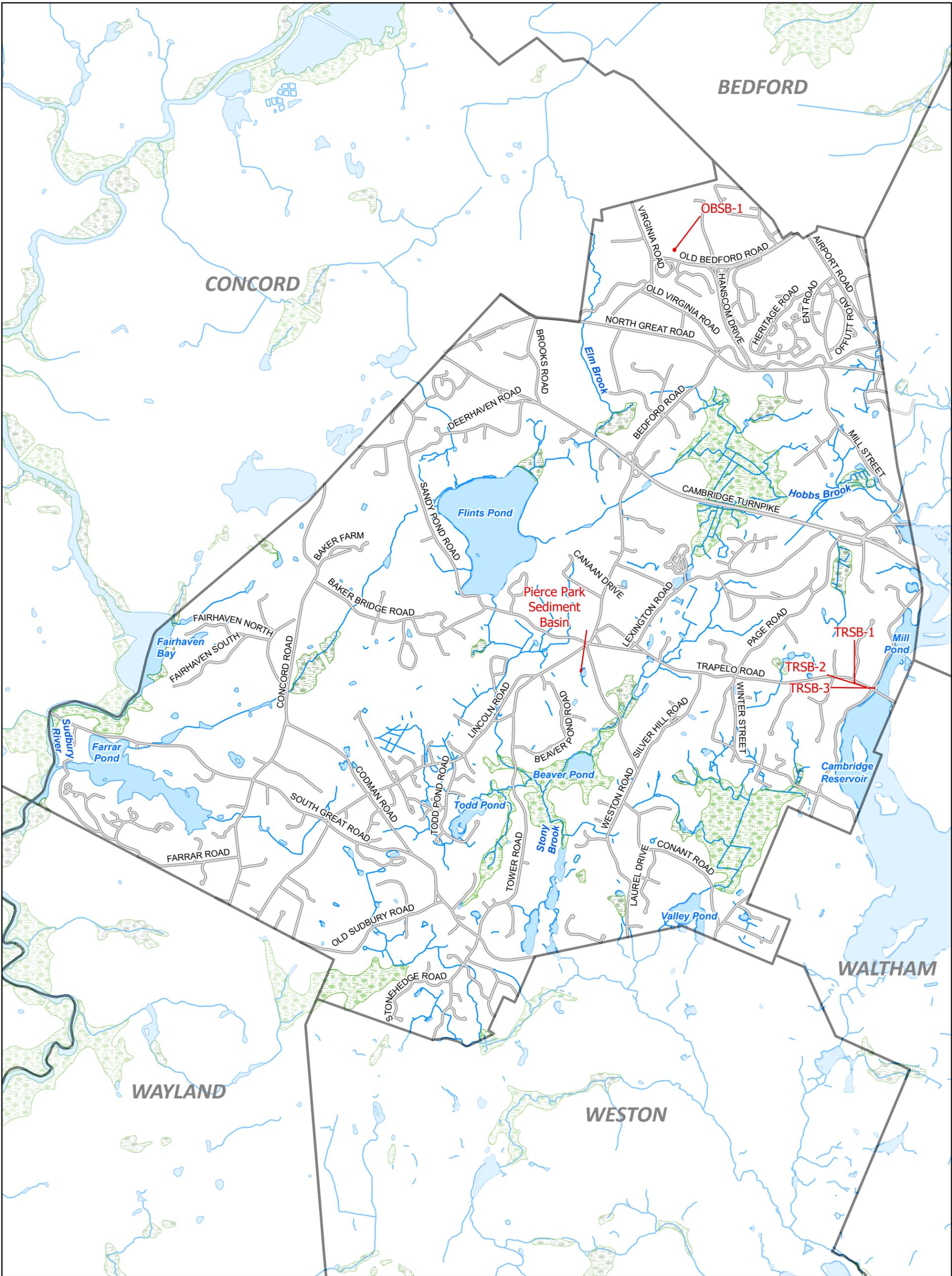
BMP STORMWATER INSPECTION REPORT

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|---|--|---|
| BMPs requiring follow up action. | | | | | |
| OBSB-1 Old Bedford Road | Detention Basin | 4/27/2022 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Overgrown woody vegetation on earthen embankment. | Woody vegetation covering <50% embankment surface area. | No immediate action. inspect annually. |
| | | | Overgrown vegetation on side slopes and bottom. | Vegetation not impacting function/capacity. | No immediate action. inspect annually. |
| | | | Erosion on side slopes and bottom. | Erosion not causing excess sedimentation. | No immediate action. inspect annually. |
| | | | Hole/depressions on side slopes and bottom. | Hole/depression not causing excess sedimentation or undermining of BMP components. | No immediate action. inspect annually. |
| | | | Clogged outlet. | Any portion of pipe clogged <1/4 capacity. | No immediate action. Inspect annually. |
| | | | Presence of Invasive Species. | Phragmites and multiflora rose present in basin bottom. | Remove and dispose of invasives in accordance with regulations. |
| | | | Dead Vegetation. | Dead vegetation impacting function. | Remove and replace vegetation as needed to maintain function. |



BMP STORMWATER INSPECTION REPORT

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|-------------------------------|---|--|
| BMPs requiring follow up action. | | | | | |
| PPSB-1 Pierce Park | Sediment Basin | 4/27/2022 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Debris accumulation. | Accumulation <1/2 depth from BMP bottom to lowest invert pipe. | No immediate actions. Inspect annually and remove debris to maintain capacity. |
| | | | Clogged outlet. | Any portion of pipe clogged <1/4 capacity. | No immediate action. Inspect annually. |
| | | | Structural Damage. | Missing rocks from inlet headwall. | No immediate action. Inspect annually. |
| | | | Presence of Invasive Species. | Japanese Knotweed present along banks and contributing to debris buildup at outlet. | Remove and dispose of invasives in accordance with regulations. |
| | | | Dead Vegetation. | Dead vegetation impacting function. | Remove and replace vegetation as needed to maintain function. |
| BMPs requiring routine inspection with no immediate follow up action required. | | | | | |
| TRSB-3 Trapelo Road | Settling Basin | 4/27/2022 | Sediment accumulation. | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| | | | Structural damage. | Corrosion of piped outlet. | No immediate action. Inspect annually. |

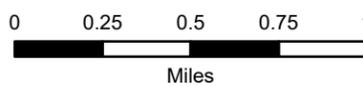


Legend

-  BMP
-  Roads
-  Lake, Pond, Reservoir
-  Wetland, Marsh, Swamp
-  Stream, Brook

Stormwater BMP Map

Lincoln, MA



Comprehensive
Environmental
Incorporated

Data Sources: MassGIS, Town of Lincoln, CEI



STORMWATER BMP INSPECTION REPORT

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Table 1 – Stormwater Infrastructure Inspected

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|--------|------------------|---------------------|-------------------|----------------------|
| TRSB-1 | Trapelo Road | Settling Basin | Poor | Yes |
| TRSB-2 | Trapelo Road | Settling Basin | Poor | Yes (minor) |
| TRSB-3 | Trapelo Road | Settling Basin | Good | No |
| OBSB-1 | Old Bedford Road | Detention Basin | Fair | Yes (minor) |
| PPSB-1 | Pierce Park | Grass Swale | Fair | Yes (minor) |



STORMWATER BMP INSPECTION REPORT

Recommendations

As noted previously, the inspected BMPs are all located within the regulated UA and/or discharge to waters of the United States. One BMP was in good operating order while the others are in fair condition and require minor maintenance as noted on the attached inspection sheets. Minor maintenance generally includes removal of plant material buildup, sediment vacuuming, trimming back or removal of vegetation, and general landscaping.

Table 2 below provides a brief summary of maintenance requirements for each BMP, while Table 3 provides additional information on inspection results. Based on CEI's inspections, the maintenance items identified in Table 2 below should be completed in order to improve BMP functionality.

Table 2 – BMP Maintenance Recommendations

| BMP ID / Location | Recommendations |
|---------------------------|---|
| TRSB-1 / Trapelo Road | <ul style="list-style-type: none">• Repair erosion and stabilize with fabric and stone armoring• Remove sediment accumulation at outlet• Remove sediment within the infiltration area and scarify bottom surface |
| TRSB-2 / Trapelo Road | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove sediment within the infiltration area and scarify bottom surface• Repair erosion and stabilize with fabric and stone armoring |
| OBSB-1 / Old Bedford Road | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove and replace vegetation as needed to maintain function• Remove and dispose of invasive species in accordance with regulations |
| PPSB-1 / Pierce Park | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove dead trees to restore capacity• Remove and dispose of invasive species in accordance with regulations |

Locations should be maintained as outlined above. Inspections should continue annually with the next inspection occurring in spring 2023. If additional town-owned BMPs are identified, they should also be maintained as needed and inspected annually. BMP maps and inventories should also be updated to reflect all BMPs, and as-built plans retained on file where possible to aid in future inspections.

If you have any further questions or would like additional information, please feel free to contact me at 800.725.2550 x303 or ncristofori@ceiengineers.com. Thank you.

Nick Cristofori, P.E.
Principal, Project Manager

Attachments:

- BMP map
- Stormwater inspection reports and photograph



BMP STORMWATER INSPECTION REPORT

Table 3 – Stormwater Infrastructure Inspected and Maintenance Recommendations

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|--------------------------------------|--|--|
| BMPs requiring follow up action. | | | | | |
| TRSB-1 Trapelo Road | Settling Basin | 4/27/2022 | Clogged outlet piping. | More than ½ portion clogged. | Inspect annually. Remove clogged outlet. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |
| TRSB-2 Trapelo Road | Settling Basin | 4/27/2022 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Bottom of infiltration area clogged. | Greater than ¾ of bottom area covered by sediment. | Remove accumulation / clean-out underdrains / scarify bottom surface. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |



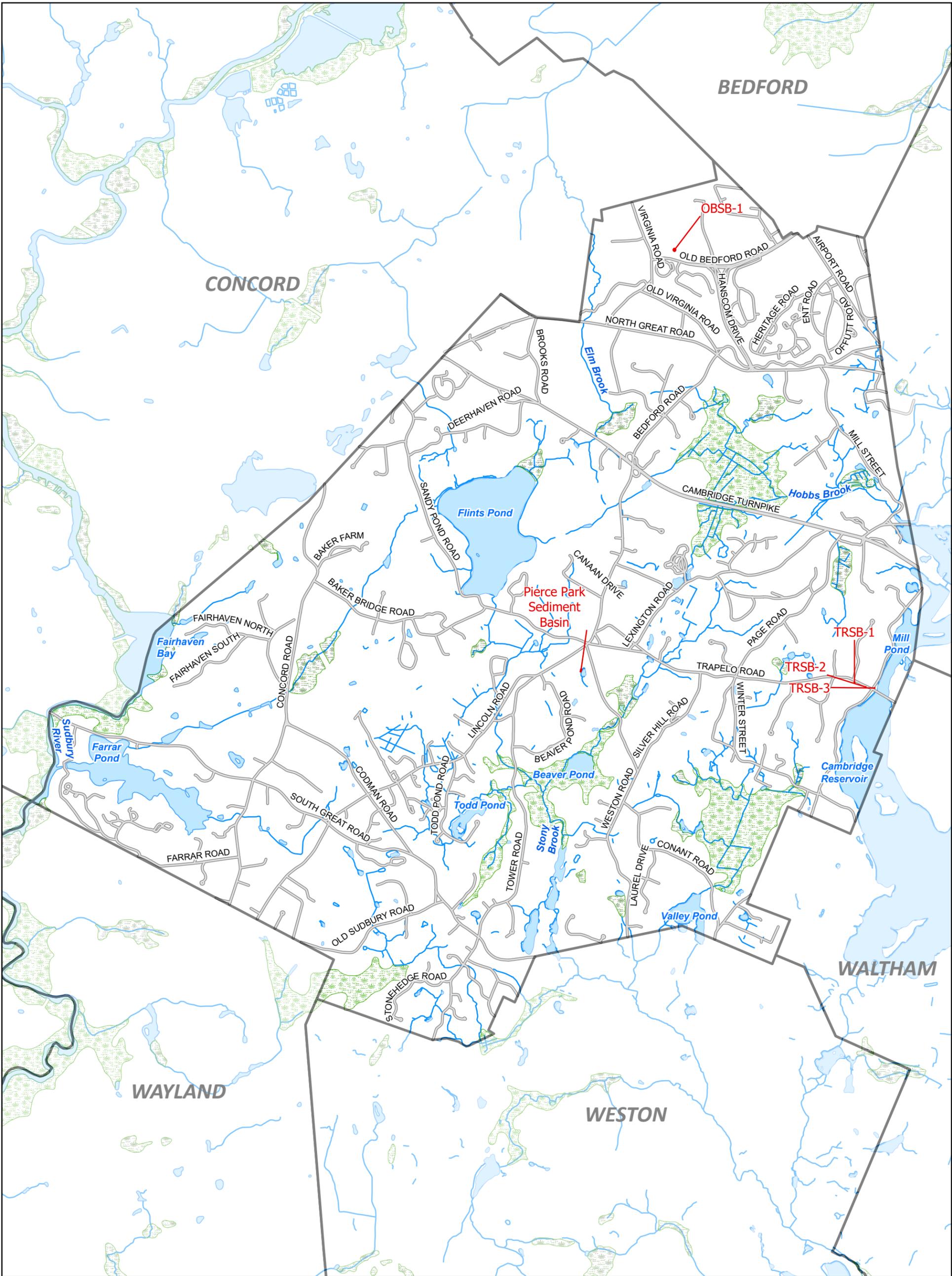
BMP STORMWATER INSPECTION REPORT

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|---|--|---|
| BMPs requiring follow up action. | | | | | |
| OBSB-1 Old Bedford Road | Detention Basin | 4/27/2022 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Overgrown woody vegetation on earthen embankment. | Woody vegetation covering <50% embankment surface area. | No immediate action. inspect annually. |
| | | | Overgrown vegetation on side slopes and bottom. | Vegetation not impacting function/capacity. | No immediate action. inspect annually. |
| | | | Erosion on side slopes and bottom. | Erosion not causing excess sedimentation. | No immediate action. inspect annually. |
| | | | Hole/depressions on side slopes and bottom. | Hole/depression not causing excess sedimentation or undermining of BMP components. | No immediate action. inspect annually. |
| | | | Clogged outlet. | Any portion of pipe clogged <1/4 capacity. | No immediate action. Inspect annually. |
| | | | Presence of Invasive Species. | Phragmites and multiflora rose present in basin bottom. | Remove and dispose of invasives in accordance with regulations. |
| | | | Dead Vegetation. | Dead vegetation impacting function. | Remove and replace vegetation as needed to maintain function. |



BMP STORMWATER INSPECTION REPORT

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|-------------------------------|---|--|
| BMPs requiring follow up action. | | | | | |
| PPSB-1 Pierce Park | Sediment Basin | 4/27/2022 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Debris accumulation. | Accumulation <1/2 depth from BMP bottom to lowest invert pipe. | No immediate actions. Inspect annually and remove debris to maintain capacity. |
| | | | Clogged outlet. | Any portion of pipe clogged <1/4 capacity. | No immediate action. Inspect annually. |
| | | | Structural Damage. | Missing rocks from inlet headwall. | No immediate action. Inspect annually. |
| | | | Presence of Invasive Species. | Japanese Knotweed present along banks and contributing to debris buildup at outlet. | Remove and dispose of invasives in accordance with regulations. |
| | | | Dead Vegetation. | Dead vegetation impacting function. | Remove and replace vegetation as needed to maintain function. |
| BMPs requiring routine inspection with no immediate follow up action required. | | | | | |
| TRSB-3 Trapelo Road | Settling Basin | 4/27/2022 | Sediment accumulation. | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| | | | Structural damage. | Corrosion of piped outlet. | No immediate action. Inspect annually. |

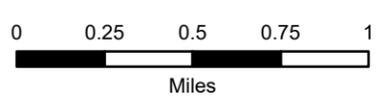


Legend

Stormwater BMP Map

Lincoln, MA

-  BMP
-  Roads
-  Lake, Pond, Reservoir
-  Wetland, Marsh, Swamp
-  Stream, Brook



Data Sources: MassGIS, Town of Lincoln, CEI



STORMWATER BMP INSPECTION REPORT

To: Mr. Chris Bibbo - DPW Director, Town of Lincoln

From: Nick Cristofori, P.E., Comprehensive Environmental Inc.

Date: June 26, 2023

Locations: Trapelo Road (3), Pierce Park (1), Old Bedford Road (1)

Town: Lincoln, MA

Inspectors: Kevin Barbara, CEI

Inspection Dates: June 15, 2023

Under the Environmental Protection Agency’s (EPA’s) 2016 National Pollutant Discharge and Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit, regulated communities such as Lincoln are required to annually inspect stormwater Best Management Practices (BMPs) within the regulated Urbanized Area (UA) and maintain as needed. In response, Comprehensive Environmental Inc. (CEI) performed an inspection of stormwater BMPs at the identified locations on June 15, 2023 to evaluate general conditions and document recommended maintenance items for follow-up action in order to meet permit requirements.

Inspections

The Town of Lincoln DPW identified 5 different BMPs that required inspections in order to meet permit requirements and provided design plans for each site. BMP locations are identified by street name and BMP type, with locations shown on a town-wide GIS map. Table 1 below details the locations and individual BMPs that were inspected, while Table 2 summarizes maintenance needs for each location. Table 3 at the end of the report provides additional inspection results and details of maintenance needs. BMP inspection results are detailed in the attached inspection sheets attached to this report, along with representative photo documentation.

At the time of the inspections, the weather was approximately 60 to 65 degrees and partly sunny. Weather over a three-day period leading up to June 15th was between 60 to 75 degrees with heavy rain on June 14th. Kevin Barbara of CEI performed the inspections and noted the following general condition and maintenance needs:

Table 1 – Stormwater Infrastructure Inspected

| BMP ID | Location | Stormwater BMP Type | Overall Condition | Requires Maintenance |
|--------|------------------|---------------------|-------------------|----------------------|
| TRSB-1 | Trapelo Road | Settling Basin | Fair | Yes (minor) |
| TRSB-2 | Trapelo Road | Settling Basin | Poor | Yes (minor) |
| TRSB-3 | Trapelo Road | Settling Basin | Fair | Yes (minor) |
| OBSB-1 | Old Bedford Road | Detention Basin | Fair | Yes (minor) |
| PPSB-1 | Pierce Park | Grass Swale | Fair | Yes (minor) |



STORMWATER BMP INSPECTION REPORT

Recommendations

As noted previously, the inspected BMPs are all located within the regulated UA and/or discharge to waters of the United States. All BMPs were either in fair or poor condition and will require minor maintenance as noted on the attached inspection sheets. Minor maintenance generally includes removal of plant material buildup, sediment vacuuming, trimming back or removal of vegetation, and general landscaping.

Table 2 below provides a brief summary of maintenance requirements for each BMP, while Table 3 provides additional information on inspection results. Based on CEI's inspections, the maintenance items identified in Table 2 below should be completed in order to improve BMP functionality.

Table 2 – BMP Maintenance Recommendations

| BMP ID / Location | Recommendations |
|---------------------------|---|
| TRSB-1 / Trapelo Road | <ul style="list-style-type: none">• Repair erosion and stabilize with fabric and stone armoring• Remove sediment accumulation and leaf debris throughout basin |
| TRSB-2 / Trapelo Road | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove sediment within the infiltration area and scarify bottom surface• Repair erosion and stabilize with fabric and stone armoring• Replace riprap at inlet |
| TRSB-3 / Trapelo Road | <ul style="list-style-type: none">• Remove sediment accumulation and leaf debris throughout basin• Repair erosion and stabilize with fabric and stone armoring• Remove and replace vegetation as needed to maintain function |
| OBSB-1 / Old Bedford Road | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove and replace vegetation as needed to maintain function• Repair erosion and stabilize with fabric and stone armoring |
| PPSB-1 / Pierce Park | <ul style="list-style-type: none">• Remove sediment to restore storage capacity• Remove dead trees to restore capacity• Remove and dispose of invasive species in accordance with regulations |

Locations should be maintained as outlined above. Inspections should continue annually with the next inspection occurring in spring 2024. If additional town-owned BMPs are identified, they should also be maintained as needed and inspected annually. BMP maps and inventories should also be updated to reflect all BMPs, and as-built plans retained on file where possible to aid in future inspections.

If you have any further questions or would like additional information, please feel free to contact me at 800.725.2550 x303 or ncristofori@ceiengineers.com. Thank you.

Nick Cristofori, P.E.
Principal, Project Manager

Attachments:

- Table 3 – Stormwater Infrastructure Inspected and Maintenance Recommendations
- Stormwater BMP Map
- Stormwater inspection reports and photographs



BMP STORMWATER INSPECTION REPORT

Table 3 – Stormwater Infrastructure Inspected and Maintenance Recommendations

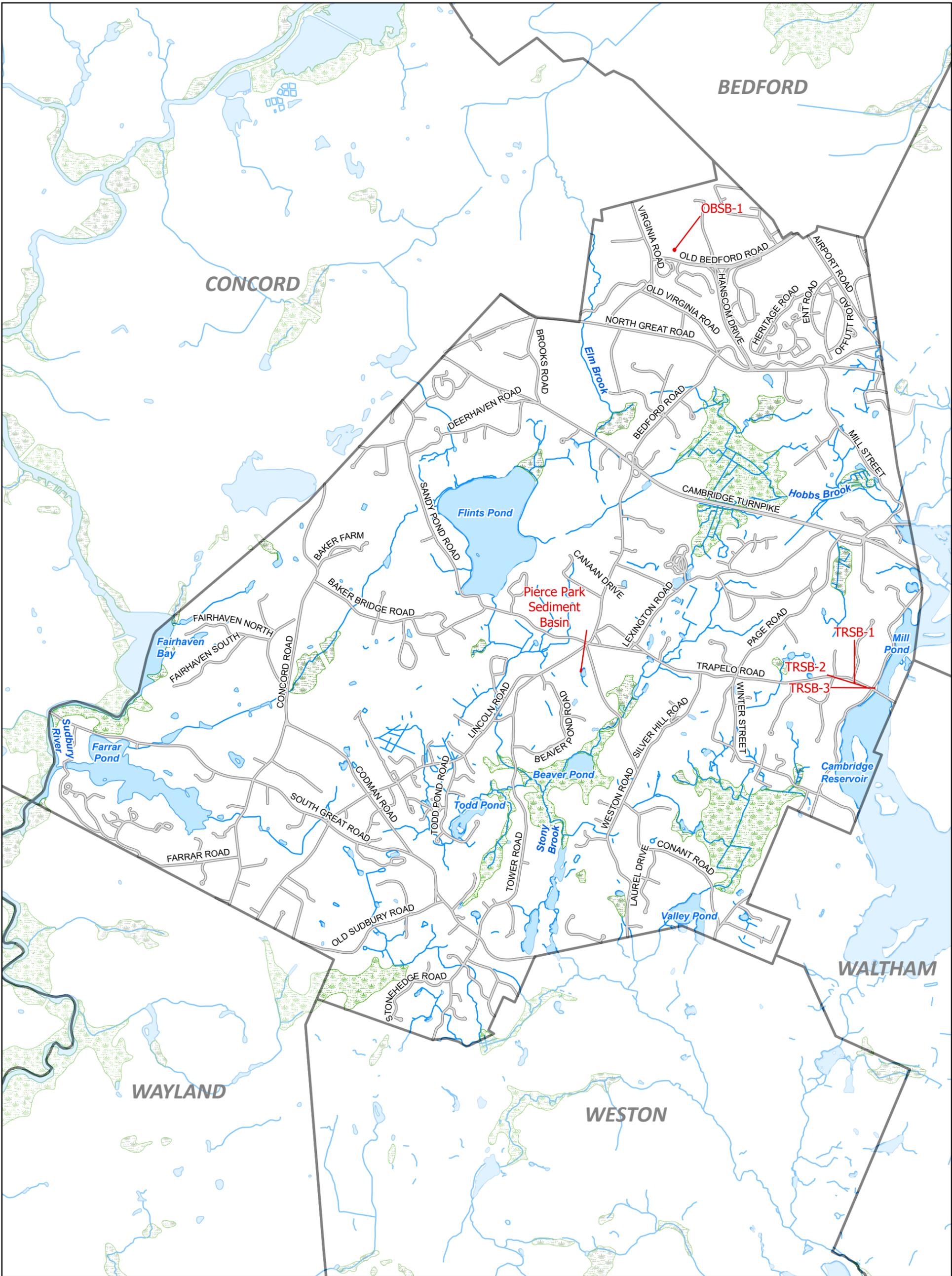
| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|---|---|--|
| BMPs requiring follow up action. | | | | | |
| TRSB-1 Trapelo Road | Settling Basin | 6/15/2023 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |
| TRSB-2 Trapelo Road | Settling Basin | 6/15/2023 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Bottom of infiltration area clogged. | Less than ¾ of bottom area covered by sediment. | No immediate action. Inspect annually. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |
| | | | Displaced riprap at inlet. | Loss of stone less than 12”. | Replace riprap. |
| TRSB-3 Trapelo Road | Settling Basin | 6/15/2023 | Sediment accumulation. | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| | | | Erosion on side slopes and bottom. | Erosion not causing excess sedimentation. | No immediate action. Inspect annually. |
| | | | Overgrown vegetation on side slopes and bottom. | Vegetation not impacting function/capacity. | No immediate action. Inspect annually. |



BMP STORMWATER INSPECTION REPORT

Table 3 – Stormwater Infrastructure Inspected and Maintenance Recommendations (continued)

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|---|--|---|
| BMPs requiring follow up action. | | | | | |
| OBSB-1 Old Bedford Road | Detention Basin | 6/15/2023 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Overgrown vegetation on side slopes and bottom. | Vegetation not impacting function/capacity. | No immediate action. Inspect annually. |
| | | | Erosion on side slopes and bottom. | Erosion not causing excess sedimentation. | No immediate action. Inspect annually. |
| | | | Hole/depressions on side slopes and bottom. | Hole/depression not causing excess sedimentation or undermining of BMP components. | No immediate action. Inspect annually. |
| | | | Dead Vegetation. | Dead vegetation impacting function. | Remove and replace vegetation as needed to maintain function. |
| PPSB-1 Pierce Park | Grass Swale | 6/15/2023 | Sediment accumulation. | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| | | | Dead Vegetation. | Dead vegetation impacting function. | Remove and replace vegetation as needed to maintain function. |

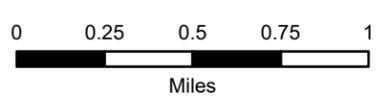


Legend

Stormwater BMP Map

Lincoln, MA

-  BMP
-  Roads
-  Lake, Pond, Reservoir
-  Wetland, Marsh, Swamp
-  Stream, Brook



Data Sources: MassGIS, Town of Lincoln, CEI



STORMWATER BMP INSPECTION REPORT

To: Mr. Chris Bibbo - DPW Director, Town of Lincoln

From: Nick Cristofori, P.E., Comprehensive Environmental Inc.

Date: June 30, 2024

Locations: Trapelo Road (3), Pierce Park (1), Old Bedford Road (1), Ballfield Road (7), Codman Community Road (1)

Town: Lincoln, MA

Inspectors: Kevin Barbara, CEI

Inspection Dates: June 5, 2024 & June 26, 2024

Under the Environmental Protection Agency’s (EPA’s) 2016 National Pollutant Discharge and Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit, regulated communities such as Lincoln are required to annually inspect stormwater Best Management Practices (BMPs) within the regulated Urbanized Area (UA) and maintain as needed. In response, Comprehensive Environmental Inc. (CEI) performed an inspection of stormwater BMPs at the identified locations on June 5, 2024 and June 26, 2024 to evaluate general conditions and document recommended maintenance items for follow-up action in order to meet permit requirements.

Inspections

The Town of Lincoln DPW identified 13 different BMPs that required inspections in order to meet permit requirements and provided design plans for each site. Of these 13 BMPs, 8 were newly constructed by the town since last year’s inspection. BMP locations are identified by street name and BMP type, with locations shown on a town-wide GIS map. After attempting to inspect the 13 BMPs, one could not be located:

- BRWQ-1- the suspected location of the BMP is surrounded in such dense vegetation that it could not be located.

Table 1 below details the locations of the 12 remaining BMPs that were inspected, while Table 2 summarizes maintenance needs for each location. Table 3 at the end of the report provides additional inspection results and details of maintenance needs. BMP inspection results are detailed in the attached inspection sheets attached to this report, along with representative photo documentation.

BRUI-1 and BRUI-2 both are underground infiltration systems underneath parking lots. Therefore, inspections were performed looking through the maintenance/clean out caps. No visible standing water was present within both these systems.

At the time of the inspections, the weather was approximately 70 degrees with light rain on the 5th and 85 degrees and sunny on the 26th. Kevin Barbara of CEI performed the inspections and noted the following general condition and maintenance needs:



STORMWATER BMP INSPECTION REPORT

Table 1 – Stormwater Infrastructure Inspected

| BMP ID | Location | Stormwater BMP Type | Overall Condition | Requires Maintenance |
|--------|------------------|-----------------------------------|-------------------|----------------------|
| BRDB-2 | Ballfield Road | Detention Basin | Good | No |
| BRUI-1 | Ballfield Road | Infiltration System (Underground) | Good | No |
| BRUI-2 | Ballfield Road | Infiltration System (Underground) | Good | No |
| BRWQ-1 | Ballfield Road | N/A | N/A | N/A |
| BRWQ-2 | Ballfield Road | Proprietary Separator | Good | No |
| BRWQ-3 | Ballfield Road | Proprietary Separator | Good | No |
| BRWQ-4 | Ballfield Road | Proprietary Separator | Good | No |
| CCRG-1 | Codman Road | Infiltration System (Underground) | Good | No |
| TRSB-1 | Trapelo Road | Settling Basin | Fair | Yes (minor) |
| TRSB-2 | Trapelo Road | Settling Basin | Poor | Yes (minor) |
| TRSB-3 | Trapelo Road | Settling Basin | Fair | Yes (minor) |
| OBSB-1 | Old Bedford Road | Detention Basin | Fair | Yes (minor) |
| PPSB-1 | Pierce Park | Grass Swale | Good | No |

Recommendations

As noted previously, the inspected BMPs are all located within the regulated UA and/or discharge to waters of the United States. Eight BMPs were in good condition. The other four were in either fair or poor condition and will require minor maintenance as noted on the attached inspection sheets. Minor maintenance generally includes removal of plant material buildup, sediment vacuuming, trimming back or removal of vegetation, and general landscaping.

Table 2 below provides a brief summary of maintenance requirements for each BMP, while Table 3 provides additional information on inspection results. Based on CEI’s inspections, the maintenance items identified in Table 2 below should be completed in order to improve BMP functionality.

Table 2 – BMP Maintenance Recommendations

| BMP ID / Location | Recommendations |
|---------------------------|---|
| TRSB-1 / Trapelo Road | <ul style="list-style-type: none"> • Repair erosion and stabilize with fabric and stone armoring • Remove sediment to restore storage capacity • Replace riprap at inlet |
| TRSB-2 / Trapelo Road | <ul style="list-style-type: none"> • Jet and clean pipe • Remove sediment to restore storage capacity • Replace riprap at inlet |
| TRSB-3 / Trapelo Road | <ul style="list-style-type: none"> • Remove sediment to restore storage capacity |
| OBSB-1 / Old Bedford Road | <ul style="list-style-type: none"> • Cut and remove vegetation surrounding BMP’s perimeter to provide access for inspection |



STORMWATER BMP INSPECTION REPORT

3

Locations should be maintained as outlined above. Inspections should continue annually with the next inspection occurring in spring 2025. If additional town-owned BMPs are identified, they should also be maintained as needed and inspected annually. BMP maps and inventories should also be updated to reflect all BMPs, and as-built plans retained on file where possible to aid in future inspections.

If you have any further questions or would like additional information, please feel free to contact me at 800.725.2550 x303 or ncristofori@ceiengineers.com. Thank you.

Nick Cristofori, P.E.
Principal, Project Manager

Attachments:

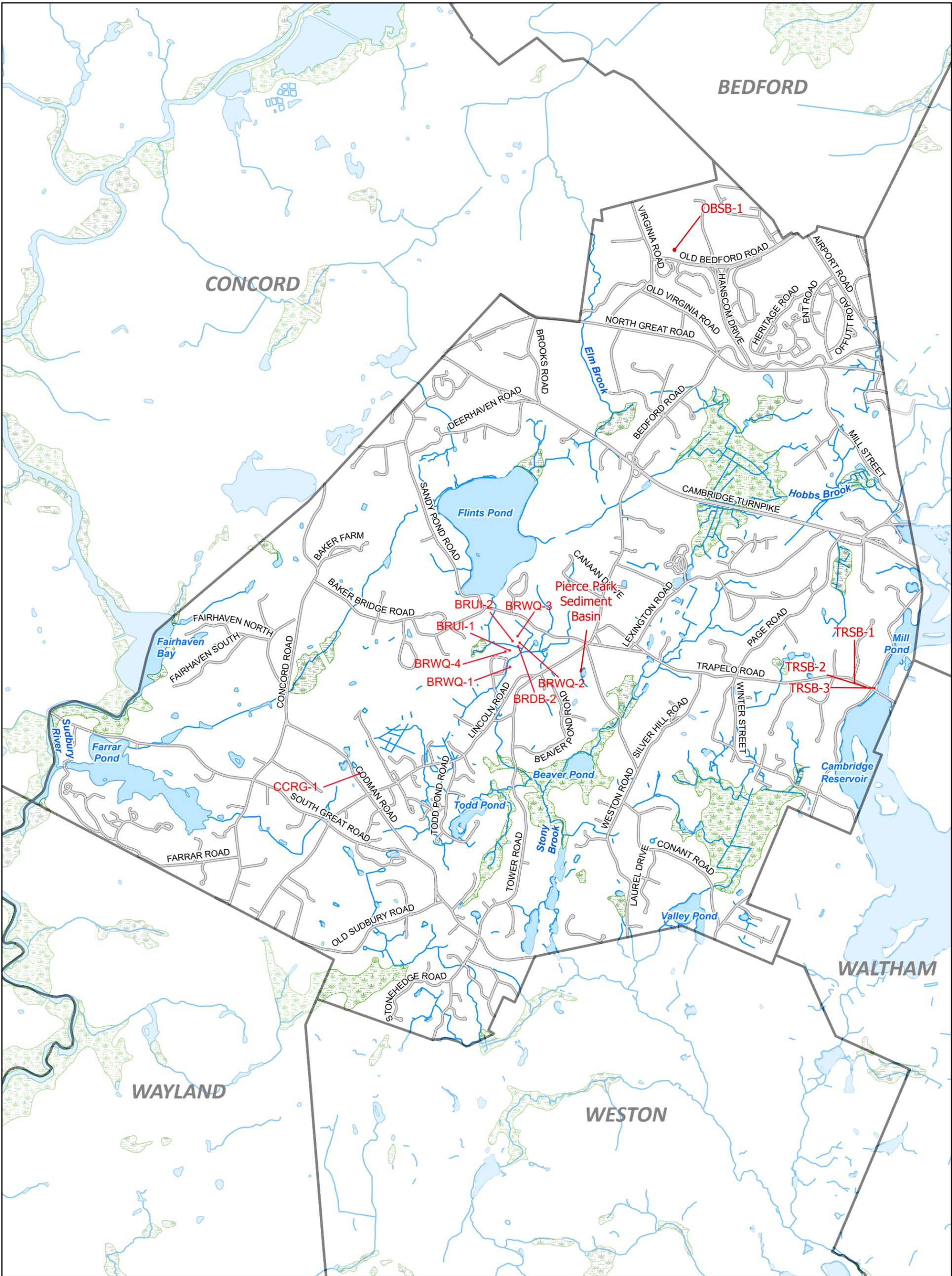
- Table 3 – Stormwater Infrastructure Maintenance Recommendations
- Stormwater BMP Map
- Stormwater inspection reports and photographs



BMP STORMWATER INSPECTION REPORT

Table 3 – Stormwater Infrastructure Maintenance Recommendations

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|--|---|--|
| BMPs requiring follow up action. | | | | | |
| TRSB-1 Trapelo Road | Settling Basin | 6/5/2024 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |
| | | | Displaced riprap at inlet | Loss of stone less than 12”. | No immediate action. Inspect annually. |
| | | | Clogged inlet piping. | Less than ¼ capacity of pipe clogged. | No immediate action. Inspect annually. |
| TRSB-2 Trapelo Road | Settling Basin | 6/5/2024 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Clogged inlet piping. | Greater than ¼ capacity of pipe clogged. | Jet and clean pipe. |
| | | | Displaced riprap at inlet. | Loss of stone less than 12”. | No immediate action. Inspect annually. |
| TRSB-3 Trapelo Road | Settling Basin | 6/5/2024 | Sediment accumulation. | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| OBSB-1 Old Bedford Road | Detention Basin | 6/5/2024 | Heavily overgrown vegetation surrounding BMP’s perimeter. Could not perform full inspection. | Vegetation impacting BMP access. | Cut and remove vegetation to regain access to BMP. |



Legend

-  BMP
-  Roads
-  Lake, Pond, Reservoir
-  Wetland, Marsh, Swamp
-  Stream, Brook

Stormwater BMP Map

Lincoln, MA



Comprehensive
Environmental
Incorporated

Data Sources: MassGIS, Town of Lincoln, CEI



STORMWATER BMP INSPECTION REPORT

1

To: Mr. Steve Olson - DPW Director, Town of Lincoln

From: Nick Cristofori, P.E., Comprehensive Environmental Inc.

Date: April 28, 2025

Locations: Trapelo Road (3), Pierce Park (1), Old Bedford Road (1), Ballfield Road (7), Codman Community Road (1)

Town: Lincoln, MA

Inspectors: Kevin Barbara, CEI

Inspection Date: April 22, 2025

Under the Environmental Protection Agency's (EPA's) 2016 National Pollutant Discharge and Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit, regulated communities such as Lincoln are required to annually inspect stormwater Best Management Practices (BMPs) within the regulated Urbanized Area (UA) and maintain as needed. In response, Comprehensive Environmental Inc. (CEI) performed an inspection of stormwater BMPs at the identified locations on April 22, 2025 to evaluate general conditions and document recommended maintenance items for follow-up action in order to meet permit requirements.

Inspections

The Town of Lincoln DPW identified 13 different BMPs that required inspections in order to meet permit requirements and provided design plans for each site. BMP locations are identified by street name and BMP type, with locations shown on a town-wide GIS map. One could not be located:

- BRWQ-1- the suspected location of the BMP is surrounded in such dense vegetation that it could not be located.

Table 1 below details the locations of the 12 remaining BMPs that were inspected, while Table 2 summarizes maintenance needs for each location. Table 3 at the end of the report provides additional inspection results and details of maintenance needs. BMP inspection results are detailed in the attached inspection sheets attached to this report, along with representative photo documentation.

BRUI-1 and BRUI-2 both are underground infiltration systems underneath parking lots. Therefore, inspections were performed looking through the maintenance/clean out caps. No visible standing water was present within both these systems.

At the time of the inspections, the weather was approximately 50 degrees with light rain on the 22nd. Kevin Barbara of CEI performed the inspections and noted the following general condition and maintenance needs:



STORMWATER BMP INSPECTION REPORT

Table 1 – Stormwater Infrastructure Inspected

| BMP ID | Location | Stormwater BMP Type | Overall Condition | Requires Maintenance |
|--------|------------------|-----------------------------------|-------------------|----------------------|
| BRDB-2 | Ballfield Road | Detention Basin | Good | No |
| BRUI-1 | Ballfield Road | Infiltration System (Underground) | Good | No |
| BRUI-2 | Ballfield Road | Infiltration System (Underground) | Good | No |
| BRWQ-1 | Ballfield Road | N/A | N/A | N/A |
| BRWQ-2 | Ballfield Road | Proprietary Separator | Good | No |
| BRWQ-3 | Ballfield Road | Proprietary Separator | Fair | Yes (minor) |
| BRWQ-4 | Ballfield Road | Proprietary Separator | Good | No |
| CCRG-1 | Codman Road | Infiltration System (Underground) | Good | No |
| OBSB-1 | Old Bedford Road | Detention Basin | Fair | Yes (minor) |
| PPSB-1 | Pierce Park | Grass Swale | Fair | Yes (minor) |
| TRSB-1 | Trapelo Road | Settling Basin | Fair | Yes (minor) |
| TRSB-2 | Trapelo Road | Settling Basin | Poor | Yes (minor) |
| TRSB-3 | Trapelo Road | Settling Basin | Fair | Yes (minor) |

Recommendations

As noted previously, the inspected BMPs are all located within the regulated UA and/or discharge to waters of the United States. Six BMPs were in good condition. The other six were in either fair or poor condition and will require minor maintenance as noted on the attached inspection sheets. Minor maintenance generally includes removal of plant material buildup, sediment vacuuming, trimming back or removal of vegetation, and general landscaping.

Table 2 below provides a brief summary of maintenance requirements for each BMP, while Table 3 provides additional information on inspection results. Based on CEI’s inspections, the maintenance items identified in Table 2 below should be completed in order to improve BMP functionality.

Table 2 – BMP Maintenance Recommendations

| BMP ID / Location | Recommendations |
|---------------------------|--|
| BRWQ-3/ Ballfield Road | <ul style="list-style-type: none"> Repair erosion and stabilize with fabric and stone armoring |
| OBSB-1 / Old Bedford Road | <ul style="list-style-type: none"> Remove sediment and debris to restore storage capacity Remove overgrown vegetation to maintain function/capacity/access |
| PPSB-1/ Pierce Park | <ul style="list-style-type: none"> Remove and replace vegetation as needed to maintain function |
| TRSB-1 / Trapelo Road | <ul style="list-style-type: none"> Repair erosion and stabilize with fabric and stone armoring |
| TRSB-2 / Trapelo Road | <ul style="list-style-type: none"> Remove sediment to restore storage capacity |
| TRSB-3 / Trapelo Road | <ul style="list-style-type: none"> Remove sediment to restore storage capacity |



STORMWATER BMP INSPECTION REPORT

3

Locations should be maintained as outlined above. Inspections should continue annually with the next inspection occurring in spring 2026. If additional town-owned BMPs are identified, they should also be maintained as needed and inspected annually. BMP maps and inventories should also be updated to reflect all BMPs, and as-built plans retained on file where possible to aid in future inspections.

If you have any further questions or would like additional information, please feel free to contact me at 800.725.2550 x303 or ncristofori@ceiengineers.com. Thank you.

Nick Cristofori, P.E.
Principal, Project Manager

Attachments:

- Table 3 – Stormwater Infrastructure Maintenance Recommendations
- Stormwater BMP Map
- Stormwater inspection reports and photographs



BMP STORMWATER INSPECTION REPORT

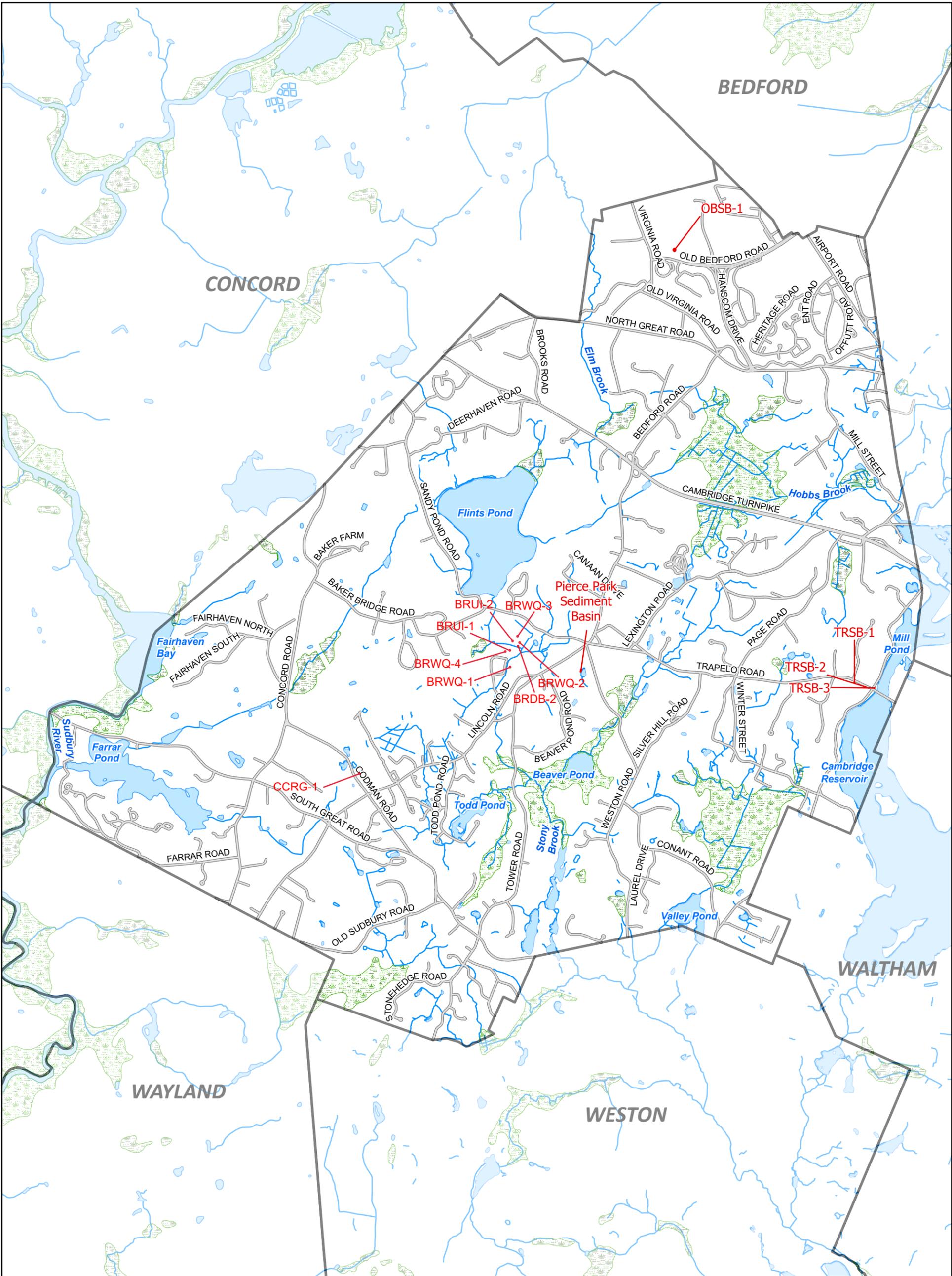
Table 3 – Stormwater Infrastructure Maintenance Recommendations

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|--------------------------|-----------------|--|--|--|
| BMPs requiring follow up action. | | | | | |
| BRWQ-3 Ballfield Road | Proprietary Separator | 4/22/2025 | Erosion on side slopes and bottom. | Erosion not causing excess sedimentation | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |
| | | | Clogged outlet piping. | Less than ¼ capacity of pipe clogged. | No immediate action. Inspect annually. |
| OBSB-1 Old Bedford Road | Detention Basin | 4/22/2025 | Overgrown vegetation on side slopes and within basin. Could not perform full inspection. | Overgrown vegetation on side slopes/bottom | Remove overgrown vegetation impacting BMP function/capacity/access. |
| | | | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Debris accumulation | Greater than ½ depth from bottom to invert. | Remove debris to restore storage capacity. |
| | | | Floatable Build Up | Floatingables cover <50% of surface area | No immediate action. Inspect annually. |
| PPSB-1 Pierce Park | Grass Swale | 4/22/2025 | Dead vegetation | Dead vegetation impacting function or aesthetics | Remove and replace vegetation as needed to maintain function. |
| | | | Sediment accumulation. | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| | | | Debris accumulation | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| | | | Clogged inlet piping. | Less than ¼ capacity of pipe clogged. | No immediate action. Inspect annually. |
| | | | Infiltration Area Clogged | Less than ¾ of bottom area covered by sediment. | No immediate action. Inspect annually. |



BMP STORMWATER INSPECTION REPORT

| ID/Location | Stormwater BMP Type | Inspection Date | Field Observations | Action Standard | Inspection or Maintenance Action |
|---|---------------------|-----------------|------------------------------------|---|--|
| BMPs requiring follow up action. | | | | | |
| TRSB-1 Trapelo Road | Settling Basin | 4/22/2025 | Sediment accumulation. | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| | | | Erosion on side slopes and bottom. | Erosion causing excess sedimentation. | Repair erosion with compacted fill and stabilize with fabric and stone armoring. |
| | | | Displaced riprap at inlet | Loss of stone less than 12”. | No immediate action. Inspect annually. |
| | | | Debris accumulation | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| | | | Infiltration Area Clogged | Less than ¾ of bottom area covered by sediment. | No immediate action. Inspect annually. |
| TRSB-2 Trapelo Road | Settling Basin | 4/22/2025 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Debris accumulation | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| | | | Clogged inlet piping. | Less than ¼ capacity of pipe clogged. | No immediate action. Inspect annually. |
| | | | Infiltration Area Clogged | Less than ¾ of bottom area covered by sediment. | No immediate action. Inspect annually. |
| | | | Displaced riprap at inlet. | Loss of stone less than 12”. | No immediate action. Inspect annually. |
| TRSB-3 Trapelo Road | Settling Basin | 4/22/2025 | Sediment accumulation. | Greater than ½ depth from bottom to invert. | Remove sediment to restore storage capacity. |
| | | | Debris accumulation | Less than ½ depth from bottom to invert. | No immediate action. Inspect annually. |
| | | | Structural damage | Corrosion beginning to form at inlet pipe | No immediate action. Inspect annually. |



Legend

-  BMP
-  Roads
-  Lake, Pond, Reservoir
-  Wetland, Marsh, Swamp
-  Stream, Brook

Stormwater BMP Map

Lincoln, MA



Comprehensive
Environmental
Incorporated

Data Sources: MassGIS, Town of Lincoln, CEI

Appendix I

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:

EPA NPDES Permit Number:

Primary MS4 Program Manager Contact Information

Name: Title:

Street Address Line 1:

Street Address Line 2:

City: State: Zip Code:

Email: Phone Number:

Fax Number:

Stormwater Management Program (SWMP) Information

SWMP Location (web address):

Date SWMP was Last Updated:

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:

N/A, no sanitary sewer present within Lincoln

- 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:

<https://lincolntown.org/1010/Stormwater-and-Climate-Resiliency; IDDE Plan, Appendix B>

- 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

Charles River Watershed Phosphorus TMDL

- Begin Phase 1 Phosphorus Control Plan (PCP)

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:

SSO Overflows - N/A, no sanitary sewer is present within Lincoln.

Public Education and Outreach - During August 2019, the Town developed a comprehensive public education program. In part, this program consisted of a new website with a permit overview, specific messages and topics for each of the Town's three audiences (note, the Town has no Industrial audience), links to external websites, and links for download of approximately 20 different outreach brochures. This program also consists of a detailed schedule for material distribution, including seasonal messages for bacteria TMDL requirements. Seasonal message outreach will start during fall 2019.

IDDE Bylaw and Construction/ Erosion and Sediment Control Bylaw - The Town is currently reviewing a

draft IDDE Bylaw and Construction/ Erosion and Sediment Control Bylaw. The Town will also be adopting updated Post-Construction Stormwater Management Bylaw during Year 2. It is anticipated that all bylaws will be put up for vote at the spring 2020 town meeting.

Procedures for Site Plan Review and Site Inspections - The Town has existing requirements under its Zoning Bylaws and Subdivision Rules and Regulations that apply to all large-scale development within town. In part, this requires site inspections by a third-party review engineer, submittal of written monthly reports to the Planning Board and Conservation Commission, and review of all SWPPPs. Although the existing program applies to the majority of >1-acre projects, they do not provide a comprehensive program covering all regulated development under the Phase II program. Therefore, these will be revised along with the bylaw updates to be completed during Year 2.

Stormwater BMP Inspections - The Town is currently developing an inventory of its town-owned Stormwater BMPs. Inspections are expected to begin during fall of Year 2.

IDDE Training - An employee IDDE Training program will be developed during Year 2, with annual training to be performed starting in Year 2.

Increased Sweeping for High Pollutant Loads - This was determined not to be necessary for the Town as these areas are not observed to accumulate more sediment and debris than other areas within the Town.

PCP Phase 1 - The Town will begin preparation of its PCP during Year 2, beginning with a legal analysis in accordance with permit schedule requirements.

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 the reporting period:

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: Video, Think Blue Massachusetts "Fowl Water"

Message Description and Distribution Method:

Think Blue Massachusetts "Fowl Water" video (<https://www.thinkbluemassachusetts.org/>)
Advertisement on Facebook, Instagram, & YouTube

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

6,991 social media impressions from Town residents.

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:

BMP: Flyer, Do Your "Doody" for Clean Water

Message Description and Distribution Method:

Distributed a Think Blue fact sheet describing proper dog waste management with all dog license applications and renewals.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Distribute fact sheets with all dog license registrations and renewals. 665 flyers were distributed during Permit Year 1.

Message Date(s): Ongoing

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: Flyers, Residential Topics

Message Description and Distribution Method:

Distribute flyers regarding stormwater awareness and healthy lawns and landscapes, detailing pet waste disposal, lawn care, and the minimization or elimination of pesticide and fertilizer use. Provide flyer at annual Town Meeting

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Make flyers available at one annual event per year.

Message Date(s): March 23, 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: Handbook, "Ecological Design, Construction and Maintenance"

Message Description and Distribution Method:

Provide a handbook on "Ecological Design, Construction and Maintenance" to all developers and interested residents. The Handbook is also available online for download from the Town's Conservation Commission website.

Targeted Audience: Residents, Developers (construction)

Responsible Department/Parties: Conservation Commission, Information Technology

Measurable Goal(s):

Make handbook available with all permit applications and continuously available online.

Message Date(s): Ongoing

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: Press Release, "In Search of Storm Drains" Stormwater Article in the Lincoln Squirrel

Message Description and Distribution Method:

Published a Letter to the Editor, "In Search of Storm Drains" outlining MS4 Permit requirements and ongoing mapping efforts.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Write at least one article per year.

Message Date(s): August 15, 2018

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: Special Events, Conservation Walk

Message Description and Distribution Method:

Host an ongoing series of conservation walk to introduce locals to conservation issues and connect residents to local natural resources while out in nature.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Hold at least two events per year. During Permit Year 1, a total of 16 conservation walks were held, 8 in the fall of 2018 (from September 12 – November 7) and 8 in the spring of 2019 (from April 10 – June 5).

Message Date(s): September 12 – November 7 and April 10 – June 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: Website, Stormwater GIS Mapping

Message Description and Distribution Method:

Provide a Town website with free access to GIS data layers that in part pertain to stormwater

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities, Developers (construction)

Responsible Department/Parties: Information Technology

Measurable Goal(s):

Continue to update data layers to allow public access to accurate, up-to-date content.

Message Date(s): Ongoing

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 the reporting period:

SWMP Plan for Download - The Town has posted the SWMP Plan on Town website along with contact information to allow for public comment.

Earth Day Town-Wide Cleanup - The Town hosted its annual cleanup day on April 22, 2019. This year's event focused on stream corridors, primarily along the Sudbury River along Route 117. 23 residents participated.

Earth Day School Stream Cleanup Day - The Town hosted its annual cleanup day along stream corridors at Lincoln Public Schools. Trash and invasive plants were removed by approximately 45 participating middle school students.

Watershed Group Involvement - The Town continued its ongoing activities to protect the health of wetlands and watersheds through involvement with groups like the Charles River Stormwater Collaborative, Minuteman Advisory Group on Interlocal Coordination (MAGIC) Stormwater Partnership, and SuAsCo River Stewardship Council.

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:

Lincoln signed up as a member community with the Charles River Watershed Association's "Climate Compact" group to seek regional solutions to watershed based issues, including stormwater management.

Lincoln also updated its Hazard Mitigation Plan on June 7, 2018. Lincoln also had a Community Resilience Building Workshop on February 25, 2019 as part of our becoming a Massachusetts MVP community. Lincoln is now a MVP Designated Community.

In collaboration with MAGIC communities, Lincoln developed a Climate Resiliency Plan which in part looks at stormwater-related community and regional vulnerabilities and strategies.

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:

Number of SSOs removed:

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:

Total number of SSOs removed:

MS4 System Mapping

Describe the status of your MS4 map, including any progress made during the reporting period:

The Town has completed multiple Phase I mapping requirements under the 2016 Permit. Outfalls, receiving waters, and impaired waters within the Town's urbanized area have been mapped. The Town will work toward identifying its stormwater treatment structures, interconnections with other towns, and open channel conveyances in Permit Year 2.

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:

N/A, none completed to date

Below, report on the number of outfalls/interconnections screened during this reporting period.

Number of outfalls screened:

Below, report on the percent of total outfalls/ interconnections screened to date.

Percent of total outfalls screened:

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:

N/A, none completed to date

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:

N/A, not yet started

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:

N/A, none found to date

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:

Number of illicit discharges removed:

Estimated volume of sewage removed: [UNITS]

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:

Total number of illicit discharges removed:

Optional: Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

N/A, none found to date

Employee Training

Describe the frequency and type of employee training conducted during the reporting period:

An employee IDDE Training program will be developed during Year 2, with annual training to be performed starting in Year 2.

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:

Number of inspections completed:

Number of enforcement actions taken:

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 current Town bylaws and regulations are partially in compliance with the Year 2 requirements, however do not meet all requirements pertaining to new development and redevelopment. The Town will draft a

revised bylaw and accompanying regulations to meet all Year 2 requirements, and it is anticipated that revisions will be put up for vote at the spring 2020 town meeting.

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:

As part of the regulatory updates to be performed during Year 2, procedures for submittal of as-built drawings and long term operation and maintenance will be developed.

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:

N/A, to be completed during future permit years.

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:

N/A, to be completed during future permit years.

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 Town is currently developing an inventory of its permittee-owned properties. Once completed, facilities will be evaluated for potential BMP retrofit opportunities during future permit years.

MCM6: Good Housekeeping

Catch Basin Cleaning

Describe the status of the catch basin cleaning optimization plan:

The Town developed a Catch Basin Cleaning Optimization Plan during Permit Year 1 as a component of its SW

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:

<https://lincolntown.org/1010/Stormwater-and-Climate-Resiliency; SWMP Plan, Appendix G>

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:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

Below, report on the total number of catch basins in the MS4 system, if known.

Total number of catch basins:

If applicable:

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

Not yet applicable, pending collection of a second round of catch basin inspections. However, based on preliminary results, sediment depths within catch basins ranged from 0" to 27", with an average depth of approximately 8".

Street Sweeping

Describe the status of the written procedures for sweeping streets and municipal-owned lots:

The Town developed a Street Sweeping Optimization Plan during Permit Year 1 as a component of its SWMP Plan. This consists of a map displaying sweeping requirements throughout the Town and a Standard Operating Procedure (SOP) for completing the sweeping.

Report on street sweeping completed during the reporting period using one of the three metrics below.

Number of miles cleaned:

Volume of material removed:

Weight of material removed:

If applicable:

For rural uncurbed roadways with no catch basins, describe the progress of the inspection, documentation, and targeted sweeping plan:

DPW personnel observe all regulated town-owned roadways for maintenance needs, including street sweeping, during routine operations. Personnel also observe known trouble areas, such as projects with large-scale construction projects or projects with substantial land disturbance, for evidence of runoff-laden sediment onto roadways that may require more frequent sweeping in addition to that outlined under the Street Sweeping Optimization Plan. In addition, town residents periodically call the DPW to report localized areas needing sweeping that DPW personnel then visit to inspect. Should areas in need of additional sweeping be observed, the Town documents these areas as part of its Street Sweeping Optimization Plan and schedules areas for sweeping during the next upcoming round. Note that the Town applies no sand to roadways during winter operations, and thus observed sweeping needs are typically minimal. Inspections of rural uncurbed roadways conducted to date have not yet observed any needs for additional sweeping within regulated urbanized area roadways.

Winter Road Maintenance

Describe the status of the written procedures for winter road maintenance including the storage of salt and sand:

The Town developed SOPs for winter road maintenance during Permit Year 1. These SOPs will be included as part of a larger comprehensive Operation and Maintenance (O&M) Plan during Year 2 that covers other facilities and stormwater infrastructure.

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 Town is currently developing an inventory of its permittee-owned properties, to be completed by the end of Year 2.

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 Town is currently developing O&M Procedures for its Parks and Open Spaces, Buildings and Facilities, and Vehicles and Equipment, to be completed by the end of Year 2.

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 Town is currently working towards completing SWPPPs for applicable facilities. The Town completed a preliminary review of its facilities during Year 1 and determined that only one facility is likely applicable and

within the regulated area, the DPW Garage. During Year 2, the Town will complete a more comprehensive facility assessment and complete SWPPPs for applicable facilities by the end of Year 2.

Below, report on the number of site inspections for facilities that require a SWPPP completed during this reporting period.

Number of site inspections completed:

Describe any corrective actions taken at a facility with a SWPPP:

N/A, not yet started.

O&M Procedures for Stormwater Treatment Structures

Describe the status of the written procedure for stormwater treatment structure maintenance:

The Town is currently developing an inventory of its town-owned Stormwater BMPs. Once complete, the Town will inspect all regulated stormwater BMPs annually and perform maintenance as needed.

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, not yet started.

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:

Activities performed during Year 1 include submittal of a Notice of Intent, development of a comprehensive Stormwater Management Program (SWMP) Plan which in part also included development of a Catch Basin Cleaning Optimization Plan and Street Sweeping Optimization Plan, development of a comprehensive Illicit Discharge Detection and Elimination (IDDE) Plan which in part included creation of procedures for identifying and removing illicit discharges along with classifying, prioritizing, and delineating catchment areas. Other activities completed included development of winter operation and maintenance procedures and completing an assessment of existing stormwater-related regulatory mechanisms.

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:

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:

Title:

Signature:

Date:

[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:

EPA NPDES Permit Number:

Primary MS4 Program Manager Contact Information

Name: Title:

Street Address Line 1:

Street Address Line 2:

City: State: Zip Code:

Email: Phone Number:

Stormwater Management Program (SWMP) Information

SWMP Location (web address):

Date SWMP was Last Updated:

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) | | | |
| <input type="checkbox"/> Bacteria/Pathogens | <input type="checkbox"/> Chloride | <input type="checkbox"/> Nitrogen | <input type="checkbox"/> Phosphorus |
| <input checked="" type="checkbox"/> Solids/ Oil/ Grease (Hydrocarbons)/ Metals | | | |
| TMDL(s) | | | |
| <i>In State:</i> | <input type="checkbox"/> Assabet River Phosphorus | <input checked="" type="checkbox"/> Bacteria and Pathogen | <input type="checkbox"/> Cape Cod Nitrogen |
| | <input checked="" type="checkbox"/> Charles River Watershed Phosphorus | <input type="checkbox"/> Lake and Pond Phosphorus | |
| <i>Out of State:</i> | <input type="checkbox"/> Bacteria/Pathogens | <input type="checkbox"/> Metals | <input type="checkbox"/> Nitrogen |
| | | | <input type="checkbox"/> Phosphorus |
| | | | <input type="button" value="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:

Phase I mapping - mapping of open channel conveyances and any newly located outfalls is ongoing. Mapping interconnections with other MS4s (e.g. DOT) is ongoing, and it is expected that this will continue as part of DOT's own mapping efforts to be completed under a future TS4 permit.

As-Builts and Long-Term O&M - the Town is working on incorporating procedures for submittal of as-builts and require long term operation and maintenance as part of its stormwater regulatory updates to be completed as part of the Year 3 requirements under EPA's pending updated permit schedule. As a result of the COVID-19 outbreak, regulations were not updated as planned during Permit Year 2.

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:

Outfall Inventory and Ranking - the outfall and interconnection inventory is updated on an ongoing basis as dry weather screening is performed. The priority ranking will be updated after dry weather inspections are completed and before catchment investigations commence.

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:

Public Education and Outreach - the Town is part of the statewide ThinkBlue campaign which in part distributes a number of public outreach-related materials throughout the year, including septic system maintenance and pet waste. A message was not distributed to dog owners at the time of license issuance/renewal this year, in part due to COVID-19 forcing the closure of Town Hall for much of the year.

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:

Increased Sweeping for High Pollutant Loads - This was determined not to be necessary for the Town as these areas are not observed to accumulate more sediment and debris than other areas within the Town.

Charles River Watershed Phosphorus TMDL

- Completed Legal Analysis

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:

Optional: Use the box below to provide any additional information you would like to share as part of your self-assessment:

Dry Weather Outfall Screening - The Town attempted to inspect a total of 63 known stormwater outfalls during dry weather for potential illicit discharges. Of the 63 known stormwater outfalls that were inspected, 54 were located and 1 of which were flowing. The single flowing outfall was sampled and did not meet the permit criteria for being highly likely to contain illicit discharges. The Town will attempt to locate and inspect the 9 outfalls that could not be located, as well as an additional 30 known outfalls that have not yet been visited, for dry weather flows during Year 3.

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 Town has determined it is subject to the following additional TMDL and Impaired Waters requirements:

- Cambridge Reservoir, chloride impaired waters requirements. (Appendix H, Part IV)
- Cambridge Reservoir Upper Basin, chloride impaired waters requirements. (Appendix H, Part IV)
- Elm Brook, bacteria impaired waters requirements. (Appendix H, Part III)
- Hobbs Brook, chloride impaired waters requirements. (Appendix H, Part IV)
- Shawsheen River, bacteria impaired waters requirements. (Appendix H, Part III)
- Unnamed Tributary, chloride impaired waters requirements. (Appendix H, Part IV)

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:**

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: Video, ThinkBlue Massachusetts "Fowl Water"

Message Description and Distribution Method:

ThinkBlue Massachusetts "Fowl Water" video (<https://www.thinkbluemassachusetts.org/>) Advertisement on Facebook, Instagram, & YouTube

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

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:

BMP: Flyer, Do Your "Doody" for Clean Water

Message Description and Distribution Method:

Distributed a ThinkBlue fact sheet describing proper dog waste management with all dog license applications and renewals.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

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:

BMP: Flyers, Residential Topics

Message Description and Distribution Method:

Distribute flyers regarding stormwater awareness and healthy lawns and landscapes, detailing pet waste disposal, lawn care, and the minimization or elimination of pesticide and fertilizer use. Provide flyer at annual Town Meeting

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Make flyers available at one annual event per year. Flyers and brochures were made available at the Town Hall, however, the building was closed for approximately 4 months during Year 2 due to COVID-19.

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:

BMP: Handbook, "Ecological Design, Construction and Maintenance"

Message Description and Distribution Method:

Provide a handbook on "Ecological Design, Construction and Maintenance" to all developers and interested residents. The Handbook is also available online for download from the Town's Conservation Commission website.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Make handbook available with all permit applications, continuously available online, and at the Conservation Department.

Message Date(s): Ongoing

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:

Provide relevant stormwater information to different audiences via social media.

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities, Developers (construction)

Responsible Department/Parties: Information Technology, Planning Department

Measurable Goal(s):

Post updates onto the Lincoln Talk social media page.

Message Date(s): Ongoing

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:

project manager/facilitator and data analyst for this project as I have done many other collaboration projects like this and know lots of the technical team members

BMP: Social Media

Message Description and Distribution Method:

Provide relevant stormwater information to different audiences via social media.

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities, Developers (construction)

Responsible Department/Parties: Information Technology

Measurable Goal(s):

Follow statewide "ThinkBlue" campaign on social media platforms.

Message Date(s): Ongoing

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: Website, Stormwater GIS Mapping

Message Description and Distribution Method:

Provide a Town website with free access to GIS data layers that in part pertain to stormwater

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities, Developers (construction)

Responsible Department/Parties: Information Technology

Measurable Goal(s):

Continue to update data layers to allow public access to accurate, up-to-date content.

Message Date(s): Ongoing

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: Website, Stormwater Information

Message Description and Distribution Method:

Develop a town stormwater website with a links to external sites such as EPA and MassDEP, as well as provide stormwater brochures for download. <https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency>

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities, Developers (construction)

Responsible Department/Parties: Conservation Commission, Information Technology

Measurable Goal(s):

Create a website and complete periodic updates.

Message Date(s): Ongoing

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:**

SWMP Plan for Download - The Town has posted the SWMP Plan and other relevant information on Town website along with contact information to allow for public comment.

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:**

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:

Number of SSOs removed:

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:

Phase I Mapping - all known outfalls, stormwater BMPs, and receiving waterbodies with impairments have been mapped to date. Initial catchment delineations have also been completed based on topographic mapping and available stormwater system information. Mapping of open channel conveyances and any newly located outfalls is ongoing. Mapping interconnections with other MS4s (e.g. DOT) is ongoing, and it is expected that this will continue as part of DOT's own mapping efforts to be completed under a future TS4 permit.

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:

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:

N/A, none completed to date

*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:

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:

N/A, none found to date

*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:

Number of illicit discharges removed:

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:

Total number of illicit discharges removed:

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:**

An on-site IDDE training session was held on June 18, 2020 with applicable DPW staff. This session also provided training on Stormwater Pollution Prevention Plan (SWPPP) implementation and inspections at the DPW Garage.

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:

Number of inspections completed:

Number of enforcement actions taken:

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

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:

The Town is working on incorporating procedures for submittal of as-builts and require long term operation and maintenance as part of its stormwater regulatory updates to be completed as part of the Year 3 requirements under EPA's pending updated permit schedule. A bylaw and accompanying regulations are expected to be adopted during the spring 2021 town meeting.

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:

N/A, to be completed during future permit years.

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:

N/A, to be completed during future permit years.

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 Town completed an inventory of its permittee-owned properties during this permit year. Facilities will be evaluated for potential BMP retrofit opportunities during future permit years.

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:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins:

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:
- Volume of material removed:
- Weight of material removed:

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:

Describe any corrective actions taken at a facility with a SWPPP:

Not applicable, no corrective actions have been taken to date. Note that a SWPPP for the DPW Garage was completed on June 30, 2020. Quarterly site inspections will begin during Year 3.

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, not started yet.

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 MS4 Permit requires the Town to achieve a significant reduction in phosphorus loads to the Charles River, a significant portion of which comes from existing privately developed properties that discharge to the Town's MS4 or directly to surface waters. These existing private properties are currently not subject to stormwater permits and are not regulated to reduce their share of phosphorus contributions to TMDL waters. Instead, the Town is responsible for achieving phosphorus reductions from these private developments because these developments are located within Lincoln's MS4. The Town supports exploring a state or federal level stormwater permit for existing large commercial, industrial, and institutional properties located within the Charles River watershed to help mitigate impacts from private properties per EPA's August 13, 2020 stakeholder letter.

Structural BMP Inspections - all known structural BMPs were inspected in June 2020. Any required maintenance will be performed during Year 3.

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:

Public Education and Participation - numbers of flyers provided in public buildings taken by residents is unknown and likely minimal as these locations were closed to the public during much of Year 2. A message was not distributed to dog owners at the time of license issuance/renewal this year, in part due to COVID-19 forcing the closure of Town Hall for much of the year.

As-Builts and Long-Term O&M - the Town is working on incorporating procedures for submittal of as-builts and require long term operation and maintenance as part of its stormwater regulatory updates to be completed as part of the Year 3 requirements under EPA's pending updated permit schedule. As a result of the COVID-19 outbreak, regulations were not updated as planned during Permit Year 2.

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:

The SWMP Plan and IDDE Plan will be updated during FY-21 to address all work performed through Year 3. This will include incorporating the above items into the SWMP Plan and/or IDDE Plan as necessary, incorporate results from outfall dry weather screening, as well as documenting results of other annual activities below such as BMP inspections.

Lincoln also intends to begin preparation of a Phosphorus Control Plan (PCP) as required by Charles River watershed communities during Year 3 to begin to assess future costs to the Town.

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: Title:

Signature: Digitally signed by Timothy S. Higgins
Date: 2020.09.22 10:37:39 -04'00' Date:

[Signatory may be a duly authorized representative]

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:

EPA NPDES Permit Number:

Primary MS4 Program Manager Contact Information

Name:

Title:

Street Address Line 1:

Street Address Line 2:

City:

State:

Zip Code:

Email:

Phone Number:

Stormwater Management Program (SWMP) Information

SWMP Location (web address):

Date SWMP was Last Updated:

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:

Dry Weather Outfall Screening - Over the past 2 years, the Town attempted to inspect all 83 known stormwater outfalls within the urbanized area during dry weather to investigate for potential illicit discharges. Of the 83 known stormwater outfalls that were attempted to be inspected, 75 were located and 1 of which were flowing. The single flowing outfall was sampled and did not meet the permit criteria for being highly likely to contain illicit discharges from sanitary sources. The remaining 8 outfalls that could not be located or accessed were instead investigated at the immediate upgradient structure for potential illicit discharge indicators, of which none were observed. Note, numbers above represent all outfall screening completed to date. Numerous outfalls were revisited between Year 2 and Year 3 and thus it is difficult to quantify the number of outfalls screened in individual years.

Update Outfall Inventory and Priority Ranking - Outfall inventory and priority ranking was conducted concurrent with a comprehensive update of the SWMP and IDDE Plans, completed on July 31, 2021. The Town will continue to locate and inspect additional stormwater infrastructure during future permit years.

Illicit Discharge Control Bylaw - The Town established an “Illicit Discharge Control” bylaw under Article XXVIII of the Town’s general bylaws, (adopted May 15, 2021) which in part prohibits illicit discharges, provides provisions for investigating and eliminating illicit discharges, and implementing enforcement actions.

Construction and Post-Construction Bylaw - The Town also established a “Construction and Post-Construction Stormwater Management” bylaw under Article XXIX of the Town’s general bylaws, (adopted May 15, 2021) and accompanying “Stormwater Management Rules and Regulations” (adopted July 27, 2021) which regulate construction projects greater than 1 acre. This bylaw and accompanying regulations meet all permit requirements for construction and post-construction requirements, including provisions for new/redevelopment to remove 90%/80% of total phosphorus and 60%/50% of total suspended solid, respectively. Bylaws were adopted within this reporting period, however, regulations were adopted just outside of the reporting period but have been in development since as early as 2018.

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:

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:

Chloride

Annual Requirements

Public Education and Outreach

- Included an annual message in November/ December to private road salt applicators and commercial industrial site owners on the proper storage and application rates of winter deicing material, along with the steps that can be taken to minimize salt use and protect local waterbodies

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 Town only recently became aware of this requirement and has not yet gone through a winter cycle that allows for distribution. This requirement will be addressed during future years.

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:

Street Sweeping - all streets were swept once during Year 3.

Increased Sweeping for High Pollutant Loads - this was determined not to be necessary for the Town as these areas are not observed to accumulate more sediment and debris than other areas within the Town.

Charles River Watershed Phosphorus TMDL

- ☒ Completed the funding source assessment

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 MS4 Permit requires the Town to achieve a significant reduction in phosphorus loads to the Charles River, a significant portion of which comes from existing privately developed properties that discharge to the Town's MS4 or directly to surface waters. These existing private properties are currently not subject to stormwater permits and are not regulated to reduce their share of phosphorus contributions to TMDL waters. Instead, the Town is responsible for achieving phosphorus reductions from these private developments because these developments are located within Lincoln's MS4. The Town supports exploring a state or federal level stormwater permit for existing large commercial, industrial, and institutional properties located within the Charles River watershed to help mitigate impacts from private properties per EPA's August 13, 2020 stakeholder letter.

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 Town has determined it is subject to the following additional TMDL and Impaired Waters requirements:

- Cambridge Reservoir, chloride impaired waters requirements. (Appendix H, Part IV)
- Cambridge Reservoir Upper Basin, chloride impaired waters requirements. (Appendix H, Part IV)
- Elm Brook, bacteria impaired waters requirements. (Appendix H, Part III)
- Hobbs Brook, chloride impaired waters requirements. (Appendix H, Part IV)
- Shawsheen River, bacteria impaired waters requirements. (Appendix H, Part III)
- Unnamed Tributary, chloride impaired waters requirements. (Appendix H, Part IV)

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:**

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: Video, ThinkBlue Massachusetts "Fowl Water"

Message Description and Distribution Method:

ThinkBlue Massachusetts "Fowl Water" video (<https://www.thinkbluemassachusetts.org/>) Advertisement on Facebook, Instagram, & YouTube.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Social media impressions for the town totaled 24,212 through the town's membership in 3 coalitions/committees.

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:

BMP: Flyer, Be a Leaf Hero

Message Description and Distribution Method:

Distributed "Be a Leaf Hero" flyers during Fall 2020 season to educate residents about proper leaf disposal. Flyers were placed in the atrium of town hall, posted on the town's website, and published in the local paper.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Distribute flyers through multiple avenues. Flyers were placed in the atrium of town hall, posted on the town's website, and published in the local paper.

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:

BMP: Flyer, Do Your "Doody" for Clean Water

Message Description and Distribution Method:

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

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:

BMP: Pet Waste Signage

Message Description and Distribution Method:

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

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:

Determined that this will be another effective outreach tool

BMP: Direct Mailing to Todd Pond Abutters

Message Description and Distribution Method:

In May 2021, all Todd Pond abutters were sent an educational letter and brochure on ways to protect the water quality of ponds. The brochure included environmental tips about lawn care, picking up after your dog, and proper maintenance of septic systems.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute flyer to all abutters to Todd Pond.

Message Date(s): May 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: Handbook, "Ecological Design, Construction and Maintenance"

Message Description and Distribution Method:

Provide a handbook on "Ecological Design, Construction and Maintenance" to all developers and interested residents. The Handbook is also available online for download from the Town's Conservation Commission website.

Targeted Audience: Residents, Developers (construction)

Responsible Department/Parties: Conservation Commission, Information Technology

Measurable Goal(s):

Make handbook available with all permit applications, continuously available online, and at the Conservation Department.

Message Date(s): Continuous / Ongoing

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: Website, Stormwater GIS Mapping

Message Description and Distribution Method:

Provide a Town website with free access to GIS data layers that in part pertain to stormwater

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities, Developers (construction)

Responsible Department/Parties: Information Technology

Measurable Goal(s):

Continue to update data layers to allow public access to accurate, up-to-date content.

Message Date(s): Continuous / Ongoing

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: Website, Stormwater Information

Message Description and Distribution Method:

Develop a town stormwater website with a links to external sites such as EPA and MassDEP, as well as provide stormwater brochures for download. <https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency>

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities, Developers (construction)

Responsible Department/Parties: Conservation Commission, Information Technology

Measurable Goal(s):

Create a website and complete periodic updates.

Message Date(s): Continuous / Ongoing

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:**

SWMP Plan for Download - The Town has posted the SWMP Plan and other relevant information on Town website along with contact information to allow for public comment.

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:**

Held two “Conservation Coffees” with 30 residents in attendance – topics included land conservation, proper dog waste disposal and construction monitoring near wetlands.

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:

Number of SSOs removed:

MS4 System Mapping

Optional: Provide additional status information regarding your map:

All known outfalls, stormwater BMPs, and receiving waterbodies with impairments have been mapped to date. Initial catchment delineations have also been completed based on topographic mapping and available stormwater system information. Mapping of open channel conveyances and any newly located outfalls is ongoing. Mapping interconnections with other MS4s (e.g. DOT) is ongoing, and it is expected that this will continue as part of DOT's own mapping efforts to be completed under a future TS4 permit.

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:

*Below, report on the percent of outfalls/interconnections screened **to date.***

Percent of outfalls screened:

Optional: Provide additional information regarding your outfall/interconnection screening:

Over the past 2 years, the Town attempted to inspect all 83 known stormwater outfalls within the urbanized area during dry weather to investigate for potential illicit discharges. Of the 83 known stormwater outfalls that were attempted to be inspected, 75 were located and 1 of which was flowing. The single flowing outfall was sampled and did not meet the permit criteria for being highly likely to contain illicit discharges. The remaining 8 outfalls that could not be located or accessed were instead investigated at the immediate upgradient structure for potential illicit discharge indicators, of which none were observed. Note, numbers above represent all outfall screening completed to date. Numerous outfalls were revisited between Year 2 and Year 3 and thus it is difficult to quantify the number of outfalls screened in individual years.

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:

*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:

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:

Number of illicit discharges removed:

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:

Total number of illicit discharges removed:

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**:

An on-site IDDE training session was held on June 6, 2021 with applicable DPW staff. This session also provided training on Stormwater Pollution Prevention Plan (SWPPP) implementation and inspections at the DPW Garage.

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:

Number of inspections completed:

Number of enforcement actions taken:

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

As-built Drawings

Below, report on the number of as-built drawings received during this reporting period.

Number of as-built drawings received:

Optional: Enter any additional information relevant to the submission of as-built drawings:

Note that the town just recently passed a regulations requiring submittal of as-built drawings for projects that disturb one or more acre. It is anticipated that the number of as-built drawings submitted will increase during future years.

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:

N/A, to be completed during Permit Year 4.

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:

N/A, to be completed during Permit Year 4.

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 Town completed an inventory of its permittee-owned properties during this permit year. Facilities will be evaluated for potential BMP retrofit opportunities during Permit Year 4.

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:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins:

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:
- Volume of material removed: [Select Units]
- Weight of material removed:

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:

Describe any corrective actions taken at a facility with a SWPPP:

Not applicable, no corrective actions have been taken to date.

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 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:

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:

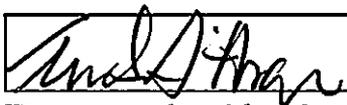
Part V: Certification of Small MS4 Annual Report 2021

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: Timothy J. Higgins

Title: Town Administrator

Signature: 

Date: 02/28/21

[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:

EPA NPDES Permit Number:

Primary MS4 Program Manager Contact Information

Name: Title:

Street Address Line 1:

Street Address Line 2:

City: State: Zip Code:

Email: Phone Number:

Stormwater Management Program (SWMP) Information

SWMP Location (web address):

Date SWMP was Last Updated:

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) | | | |
| <input type="checkbox"/> Bacteria/Pathogens | <input checked="" type="checkbox"/> Chloride | <input type="checkbox"/> Nitrogen | <input type="checkbox"/> Phosphorus |
| <input checked="" type="checkbox"/> Solids/ Oil/ Grease (Hydrocarbons)/ Metals | | | |
| TMDL(s) | | | |
| <i>In State:</i> | <input type="checkbox"/> Assabet River Phosphorus | <input checked="" type="checkbox"/> Bacteria and Pathogen | <input type="checkbox"/> Cape Cod Nitrogen |
| | <input checked="" type="checkbox"/> Charles River Watershed Phosphorus | <input type="checkbox"/> Lake and Pond Phosphorus | |
| <i>Out of State:</i> | <input type="checkbox"/> Bacteria/Pathogens | <input type="checkbox"/> Metals | <input type="checkbox"/> Nitrogen |
| | | | <input type="checkbox"/> 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:

To be determined pending discussions between various departments. Estimated June 30, 2025.

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:

To be determined pending discussions between various departments. Estimated June 30, 2025.

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:

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:

Chloride

- Completed the Salt Reduction Plan due in Year 3, updated if necessary
 - The Salt Reduction Plan is attached to the email submission
 - The Salt Reduction Plan can be found at the following website:

Annual Requirements

Public Education and Outreach

- Included an annual message in November/ December to private road salt applicators and commercial industrial site owners on the proper storage and application rates of winter deicing material, along with the steps that can be taken to minimize salt use and protect local waterbodies

Please fill out the following information on salt usage over Year 4 of the permit. Be sure to include units for amount of salt:

Type(s) of salt applied:

Amount of salt applied:

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:

Salt Reduction Plan - The Town only recently became aware of this requirement approximately one year in Permit Year 3, as Lincoln was not covered under the original 2016 permit release. It is anticipated that this will be addressed during Permit Year 5.

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:

Included as an appendix in the SWMP Plan, available for download at: <https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency>

- 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:

Increased Sweeping for High Pollutant Loads - This was determined not to be necessary for the Town as these areas are not observed to accumulate more sediment and debris than other areas within the Town.

Charles River Watershed Phosphorus TMDL

- Defined the scope of the Phosphorus Control Plan (PCP). *Please select one of the following:*
 - The PCP scope is the entire area within our jurisdiction within the Charles River Watershed
 - The PCP scope is the urbanized area portion of our jurisdiction within the Charles River Watershed

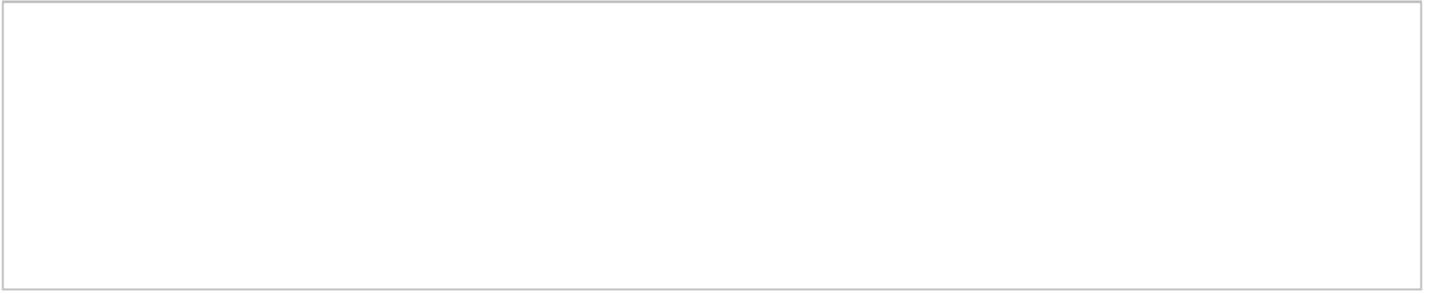
Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The MS4 Permit requires the Town to achieve a significant reduction in phosphorus loads to the Charles River, a significant portion of which comes from existing privately developed properties that discharge to the Town's MS4 or directly to surface waters. These existing private properties are currently not subject to stormwater permits and are not regulated to reduce their share of phosphorus contributions to TMDL waters. Instead, the Town is responsible for achieving phosphorus reductions from these private developments because these developments are located within Lincoln's MS4. The Town supports exploring a state or federal level stormwater permit for existing large commercial, industrial, and institutional properties located within the Charles River watershed to help mitigate impacts from private properties per EPA's August 13, 2020 stakeholder letter.

NON-TRADITIONAL AND TRANSPORTATION MS4s ONLY- municipalities please skip this section:

- Estimated the current impervious area of permittee owned property, determined the Land Use information for permittee owned property, calculated the phosphorus removal in pounds per year for any structural BMP owned by the permittee in accordance with Appendix F Attachment 3, and recorded the date of last maintenance activity for all structural BMPs for which phosphorus removal is calculated
 - The above information is attached to the email submission
 - The above information can be found at the following website:

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 Town has determined it is subject to the following additional TMDL and Impaired Waters requirements:

- Cambridge Reservoir, chloride impaired waters requirements. (Appendix H, Part IV)
- Cambridge Reservoir Upper Basin, chloride impaired waters requirements. (Appendix H, Part IV)
- Elm Brook, bacteria impaired waters requirements. (Appendix H, Part III)
- Hobbs Brook, chloride impaired waters requirements. (Appendix H, Part IV)
- Shawsheen River, bacteria impaired waters requirements. (Appendix H, Part III)
- Unnamed Tributary, chloride impaired waters requirements. (Appendix H, Part IV)

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:**

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: Video, ThinkBlue Massachusetts "Fowl Water"

Message Description and Distribution Method:

ThinkBlue Massachusetts "Fowl Water" video (<https://www.thinkbluemassachusetts.org/>) Advertisement on Facebook, Instagram, & YouTube.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Social media impressions for the town totaled 24,366 through the town's membership in 3 coalitions/committees.

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:

BMP: Flyer, Be a Leaf Hero

Message Description and Distribution Method:

Distributed "Be a Leaf Hero" flyers during Fall 2021 season to educate residents about proper leaf disposal. Flyers were placed in the atrium of town hall and posted on the town's website.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Distribute flyers through multiple avenues. Flyers were placed in the atrium of town hall and posted on the town's website.

Message Date(s): Fall 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: Website, Stormwater Information

Message Description and Distribution Method:

The Town maintains two stormwater websites, one with a variety of links and information pertaining to residents, businesses, and developers, and a second with specific information on the Town's MS4 program. Websites also provide seasonal messages that address lawn care, dog waste disposal, and snow/ice management for businesses.

<https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency>

<https://www.lincolntown.org/1122/Stormwater>

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities, Developers (construction)

Responsible Department/Parties: Conservation Commission, Information Technology

Measurable Goal(s):

Create a website and complete periodic updates.

Message Date(s): Continuous / Ongoing

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: Homeowners Guide to Protecting Ponds and Wetlands

Message Description and Distribution Method:

The Conservation Department distributed a two-page brochure entitled "Homeowners Guide to Protecting Ponds and Wetlands" which was available at their office and distributed at various public events staff attended.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute informational brochure to help protect wetlands and other resource areas at public events

throughout the year.

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:

BMP: Landscape Company Outreach

Message Description and Distribution Method:

The Conservation Dept. distributed educational information on Asian Jumping worms to landscape companies. This brochure included information about the invasive Asian Jumping Worm and how landscape professionals could help limit its spread to keep Lincoln’s soils healthy.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Distribute information on invasive species to over 50 landscaping companies.

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:

BMP: Flyer, Pet Waste

Message Description and Distribution Method:

Distribute dog waste educational flyers at the Town Clerk's office to residents obtaining a new dog license. The flyer is also available on the town's website.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Distribute educational messages with all new dog licenses issued.

Message Date(s): Continuous / Ongoing

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: Flyer, Good Owners Make Good Dogs

Message Description and Distribution Method:

Distribute dog waste educational flyers called Good Owners Make Good Dogs which educated people on the importance of picking up after their dog and leashing them near sensitive wetland areas. This flyer was handed out to trail users.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute educational messages to dog walkers utilizing the various trail system users.

Message Date(s): Continuous / Ongoing

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: Pet Waste Signage

Message Description and Distribution Method:

Designed and printed three different outreach signs about picking up after your dogs and leashing them in sensitive areas.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Educational signage was installed at 10 agricultural field entrances and major trailheads. It is estimated that 50-250 people are seeing the signs each day.

Message Date(s): Continuous / Ongoing

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: Pet Waste Collection Emails

Message Description and Distribution Method:

Provided dog waste educational information via email to a number of recipients on the importance of collecting dog waste.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distributed over 1,000 outgoing emails on the hazards of dog pollution.

Message Date(s): August through November 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: Snow and Ice Management

Message Description and Distribution Method:

Distributed a memo and brochure to business owners and property managers on snow and ice management strategies. Both were also provided on the website.

Targeted Audience: Businesses

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Targeted 30 businesses on how to properly manage snow and ice.

Message Date(s): December 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: Septic System Maintenance

Message Description and Distribution Method:

Published a document, Comprehensive Guide to Caring for your Home Septic System via Lincoln Talk (community email forum) and on the Board of Health's website.

Targeted Audience: Residents

Responsible Department/Parties: Water Department, Board of Health

Measurable Goal(s):

Provide educational outreach information on proper septic system maintenance.

Message Date(s): December 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: Enviroscape Model

Message Description and Distribution Method:

Purchased an Enviroscape Model, a hands-on demonstration model used to teach children and families about how watersheds can be affected by development, pollution, and other natural and human-made impacts. A brochure was also distributed on how to mitigate stormwater impacts.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Visit all second grade classrooms and conduct an interactive demonstration. Attend two public events per year with the interactive model.

Message Date(s): February 5, April 22, May, and June, 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:

BMP: Stormwater Pollution Prevention Tips for Homeowners

Message Description and Distribution Method:

Distributed Stormwater Pollution Prevention Tips for Homeowners. The outreach included the following tips: (1) Pick up after your pets (2) Compost yard waste (leaves and grass clippings) (3) Throw out trash in tied-garbage bags; (4) Don't put loose debris in truck beds; (5) Have regular maintenance performed on your vehicle and septic system; (6) Use fertilizer/insecticides sparingly; (7) Re-direct downspouts towards yards.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distributed over 500 outgoing messages with various stormwater pollution prevention tips.

Message Date(s): August through November 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:

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:**

SWMP Plan for Download - The Town has posted the SWMP Plan and other relevant information on Town website along with contact information to allow for public comment.

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:**

In May 2022, Conservation personnel visited all of Lincoln's second graders (50 children) for an hour-long

discussion. Specifically, the Enviroscope model was used to show the students the impacts different land uses have on wetlands and water quality. Then the students walked around the school campus to learn about the important stormwater management.

On February 5 and April 22, Conservation personnel staffed a table at Lincoln's Winter Festival and Green up day celebration used the Watershed model to educate residents on ways to protect Lincoln's wetlands and improve water quality.

Conservation personnel held 11 virtual "Conservation Coffees" with approximately 25 residents in attendance. At each of these gatherings, stormwater education was included.

Held an annual town-wide cleanup on Earth Day April 21, 2022 where over 20 people assisted in cleaning up trash along roadsides.

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:

Number of SSOs removed:

MS4 System Mapping

Optional: Provide additional status information regarding your map:

All known outfalls, stormwater BMPs, and receiving waterbodies with impairments have been mapped to date. Initial catchment delineations have also been completed based on topographic mapping and available stormwater system information. Mapping of open channel conveyances and any newly located outfalls is ongoing. Mapping interconnections with other MS4s (e.g. DOT) is ongoing, and it is expected that this will continue as part of DOT's own mapping efforts to be completed under a future TS4 permit.

The Town has identified a number of data gaps in its drainage mapping (e.g., catch basins without piping, disconnected drainage networks, etc.) and has begun investigating these through field efforts. Any new outfalls/interconnections discovered through this process will be mapped and screened for dry weather flow.

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:

*Below, report on the percent of outfalls/interconnections screened **to date.***

Percent of outfalls screened:

Optional: Provide additional information regarding your outfall/interconnection screening:

4 interconnections and 2 new outfalls were screened in Permit Year 4. None were flowing and no illicit discharge indicators were observed.

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:

*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:

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:

Number of illicit discharges removed:

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:

Total number of illicit discharges removed:

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:**

An on-site IDDE training session was held on May 24, 2022 with applicable DPW staff. This session also provided training on Stormwater Pollution Prevention Plan (SWPPP) implementation and inspections at the DPW Garage.

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:

Number of inspections completed:

Number of enforcement actions taken:

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):

Bylaw: May 15, 2021.
Regulations: July 27, 2021

As-built Drawings

Below, report on the number of as-built drawings received *during this reporting period*.

Number of as-built drawings received:

Optional: Enter any additional information relevant to the submission of as-built drawings:

Five as-built plans received for completed projects.

Retrofit Properties Inventory

Below, list the permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas (at least 5):

Pierce Park: Recommend the installation of 3 catch basins within the paved driveway area as well as the gravel parking area to the west. These catch basins will capture runoff and discharge it to the two existing ponds on site.

Codman Community Farms: Recommend the installation of multiple grassed water quality swales to direct runoff from the gravel road surfaces to a rain garden for treatment. Recommend the installation of 3 leaching catch basins to collect runoff from the gravel parking areas surrounding the main building.

Lincoln Fire Department and Police Station: Recommend the installation of two catch basins, two infiltration trenches, rain garden and detention basin to collect and treat runoff from the impervious areas surrounding the fire and police station.

Lincoln Department of Public Works: Recommend the installation of a catch basin, connected to the existing catch basin network on site. Downgradient of the catch basins, install a subsurface sediment separator and an outfall into the wooded area south of the site. The separator should be cleaned regularly due to the presence of material stockpiles.

Conservation Parcel off of Trapelo Road: Recommend the installation of a manhole structure to intercept the main drainage line from Trapelo Road, and an infiltration basin to provide treatment.

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:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins:

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:

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:

Describe any corrective actions taken at a facility with a SWPPP:

Not applicable, no corrective actions have been taken to date.

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 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:

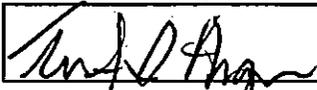
Part V: Certification of Small MS4 Annual Report 2021

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: Timothy S. Higgins

Title: Town Administrator

Signature: 

Date: 09/21/22

[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:

EPA NPDES Permit Number:

Primary MS4 Program Manager Contact Information

Name: Title:

Street Address Line 1:

Street Address Line 2:

City: State: Zip Code:

Email: Phone Number:

Stormwater Management Program (SWMP) Information

SWMP Location (publicly available web address):

Date SWMP was Last Updated:

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) | | | |
| <input type="checkbox"/> Bacteria/Pathogens | <input checked="" type="checkbox"/> Chloride | <input type="checkbox"/> Nitrogen | <input type="checkbox"/> Phosphorus |
| <input checked="" type="checkbox"/> Solids/ Oil/ Grease (Hydrocarbons)/ Metals | | | |
| TMDL(s) | | | |
| <i>In State:</i> | <input type="checkbox"/> Assabet River Phosphorus | <input checked="" type="checkbox"/> Bacteria and Pathogen | <input type="checkbox"/> Cape Cod Nitrogen |
| | <input checked="" type="checkbox"/> Charles River Watershed Phosphorus | <input type="checkbox"/> Lake and Pond Phosphorus | |
| <i>Out of State:</i> | <input type="checkbox"/> Bacteria/Pathogens | <input type="checkbox"/> Metals | <input type="checkbox"/> Nitrogen |
| | | | <input type="checkbox"/> Phosphorus |
| | | | <input type="button" value="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:

- 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:

Chloride

Annual Requirements

Public Education and Outreach

- Included an annual message in November/ December to private road salt applicators and commercial industrial site owners on the proper storage and application rates of winter deicing material, along with the steps that can be taken to minimize salt use and protect local waterbodies

The following type(s) of salt were applied **during this reporting period (year 5):**

- Sodium chloride
- Calcium chloride
- Potassium chloride

Magnesium chloride

Brine solution

Total amount of salt applied **during this reporting period (year 5) including units:**

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:

Salt Reduction Plan - The Town only recently became aware of this requirement approximately one year in Permit Year 3, as Lincoln was not covered under the original 2016 permit release. Lincoln completed a Salt Reduction Plan during Year 5 to meet permit requirements and is available for download at: <https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency>

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:

Included as an appendix in the SWMP Plan, available for download at: <https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency>

- 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:

Increased Sweeping for High Pollutant Loads - This was determined not to be necessary for the Town as these areas are not observed to accumulate more sediment and debris than other areas within the Town.

Charles River Watershed Phosphorus TMDL

- Completed the written Phase 1 Phosphorus Control Plan (PCP), including: *(select the items in the Phase 1 PCP that have been completed)*
- Planned nonstructural controls
- Planned structural controls
- O&M program for structural controls
- Implementation schedule
- Cost of implementation

The Phase 1 PCP: *(select one of the following options)*

- is attached to the email submission
- can be found at the following publicly available website:

Below, calculate your current phosphorus export rate by first filling out the individual phosphorus loading components (labeled [A], [B], [C], and [D]) and then computing your current phosphorus export rate using the equation provided.

Baseline phosphorus export reduction required from PCP Area, as identified in Appendix F (lbs/year) [A]: 185

Documented the nonstructural control measures implemented during this reporting period and their phosphorus reduction

total phosphorus reduction from all nonstructural controls this reporting period (lbs/year) [B]: 19

- No nonstructural control measures were implemented
The above referenced nonstructural control measures information is attached to the email submission
The above referenced nonstructural control measures information can be found at the following publicly available website:

[Empty text box for website URL]

Documented the structural control measures implemented during this reporting period and all previous years, including location, phosphorus reduction in mass/year, and date of last completed maintenance and inspection for each control

total phosphorus reduction from all structural controls installed this reporting period and all previous years (lbs/year) [C]: 2.01

- No structural control measures were implemented
The structural control measures information is attached to the email submission
The structural control measures information can be found at the following publicly available website:

[Empty text box for website URL]

Phosphorus load increase due to development incurred since 2005 in lbs/year [D]: 0

Current phosphorus export rate from the PCP Area in lbs/year [=A-(B+C)+D from above]: 164

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.

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

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 MS4 Permit requires the Town to reduce phosphorus loads to the Charles River, a portion of which comes

from existing privately developed properties that discharge to the Town's MS4 or directly to surface waters. These existing private properties are currently not subject to stormwater permits and are not regulated to reduce their share of phosphorus contributions to TMDL waters. Instead, the Town is responsible for achieving phosphorus reductions from these private developments because these developments are located within Lincoln's MS4. The Town supports exploring a state or federal level stormwater permit for existing large commercial, industrial, and institutional properties located within the Charles River watershed to help mitigate impacts from development per EPA's August 13, 2020 stakeholder letter.

The Town has not yet calculated increases in phosphorous load due to development since the baseline loading was calculated. The Town will update loading pending availability of updated land use data from publicly available sources that can be readily compared with previously released data.

Stormwater BMPs being claimed for phosphorous reduction credit have been evaluated in the field and/or through analysis of available design plans. Pollutant removals for BMPs with available plans have been assessed according to the provided engineering design plans to estimate pollutant reductions provided. BMPs with no available plans were instead assessed in the field according to best engineering judgment. The Town cannot certify that BMPs assessed in the field are performing as originally designed, as design plans are not available. However, we feel that reasonable steps have been made to accurately quantify pollutant removals provided by existing stormwater BMPs. Additionally, the Town continues to follow its Operation and Maintenance Plan which includes annual inspections of Town-owned BMPs, with maintenance performed as needed such that they maintain proper working order consistent with state and federal stormwater guidance.

NON-TRADITIONAL AND TRANSPORTATION MS4s ONLY- municipalities please skip this section:

Describe the planned phosphorus reduction activities on site and coordination progress with the applicable municipality:

N/A

Optional: Use the box below to provide any additional information you would like to share as part of your self-assessment:

N/A

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 Town has determined it is subject to the following additional TMDL and Impaired Waters requirements:

- Cambridge Reservoir, chloride impaired waters requirements. (Appendix H, Part IV)
- Cambridge Reservoir Upper Basin, chloride impaired waters requirements. (Appendix H, Part IV)
- Elm Brook, bacteria impaired waters requirements. (Appendix H, Part III)
- Hobbs Brook, chloride impaired waters requirements. (Appendix H, Part IV)
- Shawsheen River, bacteria impaired waters requirements. (Appendix H, Part III)
- Unnamed Tributary, chloride impaired waters requirements. (Appendix H, Part IV)

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:**

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: Video, ThinkBlue Massachusetts "Fowl Water"

Message Description and Distribution Method:

ThinkBlue Massachusetts "Fowl Water" video (<https://www.thinkbluemassachusetts.org/>) Advertisement on Facebook, Instagram, & YouTube.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Social media impressions. Results of the statewide ThinkBlue campaign were not available prior to submitting this annual report.

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:

BMP: Flyer, Be a Leaf Hero

Message Description and Distribution Method:

Distributed "Be a Leaf Hero" flyers during Fall 2022 season to educate residents about proper leaf disposal. Flyers were placed in the atrium of town hall and posted on the town's website.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Distribute flyers through multiple avenues. Flyers were placed in the atrium of town hall and posted on the town's website.

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:

BMP:Website, Stormwater Information

Message Description and Distribution Method:

The Town maintains two stormwater websites, one with a variety of links and information pertaining to residents, businesses, and developers, and a second with specific information on the Town's MS4 program. Websites also provide seasonal messages that address lawn care, dog waste disposal, and snow/ice management for businesses.

<https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency>

<https://www.lincolntown.org/1122/Stormwater>

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

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:

BMP:Homeowners Guide to Protecting Ponds and Wetlands

Message Description and Distribution Method:

The Conservation Department distributed a two-page brochure entitled "Homeowners Guide to Protecting Ponds and Wetlands" which was available at their office and distributed at various public events staff attended.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

throughout the year.

Message Date(s): Varies

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:Landscape Company Outreach

Message Description and Distribution Method:

The Conservation Dept. distributed educational information on Asian Jumping worms to landscape companies. This brochure included information about the invasive Asian Jumping Worm and how landscape professionals could help limit its spread to keep Lincoln’s soils healthy.

Targeted Audience: Commercial / Landscaping Businesses

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute information on invasive species to over 50 landscaping companies.

Message Date(s): Continuous / Ongoing

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:Pet Waste Information

Message Description and Distribution Method:

A volunteer greeted visitors at Lincoln's most popular trailhead, Mt. Misery, on 5 of the most popular weekend days. Information distribution included the importance of picking up after your dog.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute educational messages with all new dog licenses issued.

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:

BMP:Flyer, Good Owners Make Good Dogs

Message Description and Distribution Method:

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

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:

BMP:Pet Waste Signage

Message Description and Distribution Method:

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

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:

Addition

BMP:Flyer, Gardening for Climate Change

Message Description and Distribution Method:

The Lincoln Land Conservation Trust developed a printed brochure and complementing online resources on gardening for climate change mitigation, climate change resilience, and biodiversity. The brochure was distributed to every household in Lincoln and shares tips for creating and managing outdoor spaces that mitigate climate change, build resiliency to climate change, and promote biodiversity and ecosystem health.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute to every household.

Message Date(s): Spring 2023

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:

Addition

BMP:Snow and Ice Management

Message Description and Distribution Method:

Distributed a memo and brochure to business owners and property managers on snow and ice management strategies. Both were also provided on the website.

Targeted Audience: Businesses

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Targeted 30 businesses on how to properly manage snow and ice.

Message Date(s): January 2023

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:Snow and Ice Management

Message Description and Distribution Method:

Email sent from Conservation Director with stormwater tips including "Keep Lincoln's Wetlands Healthy: Manage winter salt application and storage - Cover stockpiles of salt for use in winter road maintenance. Limit the amount of salt applied. Sweep and properly dispose of any visible salt deposits once the application surface or storage area has dried out."

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities, Developers (construction)

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Emailed to Lincoln residents and posted on the Town's website.

Message Date(s): January - February 2023

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:

Addition

BMP:Septic System Maintenance

Message Description and Distribution Method:

Published a document, Comprehensive Guide to Caring for your Home Septic System via Lincoln Talk (community email forum) and on the Board of Health's website.

Targeted Audience: Residents

Responsible Department/Parties: Water Department, Board of Health

Measurable Goal(s):

Provide educational outreach information on proper septic system maintenance.

Message Date(s): Continuous/ongoing

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:Farrar Pond Education Letter

Message Description and Distribution Method:

Residents abutting Farrar Pond and Pole Brook Watershed were sent an educational letter about green landscaping, septic system maintenance, and other tips for protecting the water quality of Farrar Pond

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute to all houses abutting Farrar Pond.

Message Date(s): Continuous/Ongoing

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:

Addition

BMP:Flyer - Environmentally Friendly Yard Care Tips

Message Description and Distribution Method:

Conservation Director included in emails Enviromentally Friendly Yard Care Tips including "Fall leaves contain lots of natural fertilizer which can pollute our rivers and streams. Do not blow or rake leaves, grass clippings, brush, and tree branches into the street. These will leach nutrients into stormwater runoff and contribute to pollution in our waters. Leaf litter can also plug storm drains and increase flooding issues. Instead, mulch or compost yard waste away from streams or other waterways. Lincoln residents may bring brush and yard waste (leaves and grass clippings) can be brought to the Lincoln Public Works Facility, 30 Lewis Street during normal business hours and during the first Saturday of each month between 7:30 a.m. and 3:30 p.m. The brush and yard waste is limited to material generated by normal residential activity

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute to Lincoln Residents. Post on Town's website.

[Empty text box]

Message Date(s): October 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:

Addition

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:**

SWMP Plan for Download - The Town has posted the SWMP Plan and other relevant information on Town website along with contact information to allow for public comment.

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 Town held 6 virtual "Conservation Coffees" with approximately 30 residents in attendance - at each of these gatherings, stormwater was included.

February 6, 2023, the Conservation Commission staff gave a zoom presentation to Lincoln residents on the four-part mission of the Conservation Commission. We discussed how the Conservation Commission, and its staff, protects wetlands, manages conservation land, acquires open space, and educates residents on various conservation matters (including stormwater).

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: Number of SSOs removed: **MS4 System Mapping***Optional: Provide additional status information regarding your map:*

All known outfalls, stormwater BMPs, and receiving waterbodies with impairments have been mapped to date. Initial catchment delineations have also been completed based on topographic mapping and available stormwater system information. Mapping of open channel conveyances and any newly located outfalls is ongoing. Mapping interconnections with other MS4s (e.g. DOT) is ongoing, and it is expected that this will continue as part of DOT's own mapping efforts to be completed under a future TS4 permit.

The Town has identified a number of data gaps in its drainage mapping (e.g., catch basins without piping, disconnected drainage networks, etc.) and has begun investigating these through field efforts. Any new outfalls/interconnections discovered through this process will be mapped and screened for dry weather flow.

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:

*Below, report on the percent of outfalls/interconnections screened **to date**.*

Percent of outfalls screened: *Optional: Provide additional information regarding your outfall/interconnection screening:*

Outfalls were screened during previous permit years; no additional outfalls were screened during Year 5. As/if additional outfalls are located, they are screened during dry weather for potential illicit discharges.

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:

[Empty text box]

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:

The Town is assessing catchment investigation status during Year 6. Many catchments do not have Key Junction Manholes and/or System Vulnerability Factors; and thus inspections are complete as outfalls have been screened during dry weather.

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:

[Empty text box for website URL]

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: 0

Total number of illicit discharges removed: 0

Optional: Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

[Empty text box for optional information]

Employee Training

Describe the frequency and type of employee training conducted **during this reporting period**:

An on-site IDDE training session was held on April 6, 2023 with applicable DPW staff. This session also provided training on Stormwater Pollution Prevention Plan (SWPPP) implementation and inspections at the DPW Garage.

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: 11

Number of inspections completed: 36

Number of enforcement actions taken: 12

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

Conservation staff continued to monitor one Enforcement Action which continued from FY22. In this case, weekly erosion control inspections were performed by a qualified environmental monitor. Minor corrective repairs to erosion control devices were requested and complied with. In addition, two new enforcement Orders were issued in FY23 on minor work in the buffer zone which resulted in erosion control installation and restoration. Remaining enforcement actions are related to zoning violations.

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Date update was completed (due in year 3): Bylaw: May 15, 2021.
Regulations: July 27, 2021

Website of ordinance or regulatory mechanism:

General Bylaws: Article XXXI and Article XXXII, <http://www.lincolntown.org/DocumentCenter/View/72767/GenByLaw-FINAL-2022-UPDATED?bidId=>
Regulations: Section 5, <http://www.lincolntown.org/DocumentCenter/View/883/Subdivision-Rules-and-Regs-amended-June-2014?bidId=>

As-built Drawings

Below, report on the number of as-built drawings received during this reporting period.

Number of as-built drawings received:

Optional: Enter any additional information relevant to the submission of as-built drawings:

Ten as-built plans received for the following completed projects:

- 86 Conant Road (septic system)
- 8 Sandy Pond (septic system)
- 26 Old Winter Street (driveway construction)
- Minuteman Technical High School
- 8 Silver Hill Road New House
- 26 Longmeadow Road Addition
- 42 Baker Bridge Road New House
- Minuteman Tech School Project
- deCordova Parking and Landscaping Project
- 38 Silver Hill Road Addition

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:

No changes to date. To be determined pending discussions between various departments. Estimated June 30, 2025.

Green Infrastructure Report

Below, describe progress towards making green infrastructure practices allowable based on the report completed in Year 4:

No changes to date. To be determined pending discussions between various departments. Estimated June 30, 2025.

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):

Pierce Park: Recommend the installation of 3 catch basins within the paved driveway area as well as the gravel parking area to the west. These catch basins will capture runoff and discharge it to the two existing ponds on site.

Lincoln Fire Department and Police Station: Recommend the installation of two catch basins, two infiltration trenches, rain garden and detention basin to collect and treat runoff from the impervious areas surrounding the fire and police station.

Lincoln Department of Public Works: Recommend the installation of a catch basin, connected to the existing catch basin network on site. Downgradient of the catch basins, install a subsurface sediment separator and an outfall into the wooded area south of the site. The separator should be cleaned regularly due to the presence of material stockpiles.

Conservation Parcel off of Trapelo Road: Recommend the installation of a manhole structure to intercept the main drainage line from Trapelo Road, and an infiltration basin to provide treatment.

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.

Since the 2016 MS4 Permit became effective, the following Town-owned facilities have been retrofitted with stormwater BMPs:

- Codman Community Farms: installation of a swale and raingarden
- Lincoln Public Schools: installation of three detention/infiltration basins, three underground infiltration systems, perforated pipe, and a stormtech chamber along with six other water quality units

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:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins:

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:
- Volume of material removed: [Select Units]
- Weight of material removed:

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:

Describe any corrective actions taken at a facility with a SWPPP:

Not applicable, no corrective actions have been taken to date.

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: Title:

Signature: Date:

[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:

EPA NPDES Permit Number:

Primary MS4 Program Manager Contact Information

Name: Title:

Street Address Line 1:

Street Address Line 2:

City: State: Zip Code:

Email: Phone Number:

Stormwater Management Program (SWMP) Information

SWMP Location (publicly available web address):

Date SWMP was Last Updated:

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) | | | |
| <input type="checkbox"/> Bacteria/Pathogens | <input checked="" type="checkbox"/> Chloride | <input type="checkbox"/> Nitrogen | <input type="checkbox"/> Phosphorus |
| <input checked="" type="checkbox"/> Solids/ Oil/ Grease (Hydrocarbons)/ Metals | | | |
| TMDL(s) | | | |
| <i>In State:</i> | <input type="checkbox"/> Assabet River Phosphorus | <input checked="" type="checkbox"/> Bacteria and Pathogen | <input type="checkbox"/> Cape Cod Nitrogen |
| | <input checked="" type="checkbox"/> Charles River Watershed Phosphorus | <input type="checkbox"/> Lake and Pond Phosphorus | |
| <i>Out of State:</i> | <input type="checkbox"/> Bacteria/Pathogens | <input type="checkbox"/> Metals | <input type="checkbox"/> Nitrogen |
| | | | <input type="checkbox"/> Phosphorus |
| | | | <input type="button" value="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:

- 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:

Chloride

Annual Requirements

Public Education and Outreach

- Included an annual message in November/ December to private road salt applicators and commercial industrial site owners on the proper storage and application rates of winter deicing material, along with the steps that can be taken to minimize salt use and protect local waterbodies

The following type(s) of salt were applied **during this reporting period (year 6):**

- Sodium chloride
- Calcium chloride
- Potassium chloride

Magnesium chloride

Brine solution

Total amount of salt applied **during this reporting period (year 6) including units:**

838 tons

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:

Salt Reduction Plan - The Town only recently became aware of this requirement in Permit Year 3 when an updated 303(d) List of Impaired Waters was released, as Lincoln was not covered under a chloride impairment in the original 2016 permit release. Lincoln completed a Salt Reduction Plan during Year 5 to meet permit requirements and is available for download at: <https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency> and is currently working on completing additional salt reduction activities as feasible.

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:

Included as an appendix in the SWMP Plan, available for download at: <https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency>

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:

Increased Sweeping for High Pollutant Loads - This was determined not to be necessary for the Town as these areas are not observed to accumulate more sediment and debris than other areas within the Town.

Charles River Watershed Phosphorus TMDL

Below, calculate your current phosphorus export rate by first filling out the individual phosphorus loading components (labeled [A], [B], [C], and [D]) and then computing your current phosphorus export rate using the equation provided.

Baseline phosphorus export reduction required from PCP Area, as identified in Appendix F **(lbs/year) [A]:**

185

Total phosphorus reduction from all nonstructural controls implemented **this reporting period (lbs/year) [B]:**

19

Total phosphorus reduction from all structural controls installed this reporting period and all previous years **(lbs/year) [C]:**

2.01

Phosphorus load increase due to development incurred since 2005 in
lbs/year [D]:

Current phosphorus export rate from the PCP Area in **lbs/year [=A-(B+C)+D**
 from above]:

- 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.
 - 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
 - Implemented all nonstructural control measures **during this reporting period** and documented the measures and their phosphorus reduction. The nonstructural control measure information:
 - is attached to the email submission
 - can be found at the following publicly available website:

- Documented the structural control measures implemented during **this reporting period and all previous years**, including location, phosphorus reduction in mass/year, and date of last completed maintenance and inspection for each control. The structural control measure information:
- is not applicable; no structural control measures were implemented
 - is attached to the email submission
 - can be found at the following publicly available website:

The Phase 1 PCP: *(select one of the following options. If you submitted your PCP last year and have an updated website, please include the website below)*

- was submitted in the Year 5 Annual Report
- is attached to the email submission
- can be found at the following publicly available website:

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 MS4 Permit requires the Town to reduce phosphorus loads to the Charles River, a portion of which comes from existing privately developed properties that discharge to the Town's MS4 or directly to surface waters. These existing private properties are currently not subject to stormwater permits and are not regulated to reduce their share of phosphorus contributions to TMDL waters. Instead, the Town is responsible for achieving phosphorus reductions from these private developments because these developments are located within Lincoln's MS4. The Town supports exploring a state or federal level stormwater permit for existing large commercial, industrial, and institutional properties located within the Charles River watershed to help mitigate impacts from development per EPA's August 13, 2020 stakeholder letter.

The Town has not yet calculated increases in phosphorous load due to development since the baseline loading was calculated. The Town will update loading pending availability of updated land use data from publicly available sources that can be readily compared with previously released data.

Stormwater BMPs being claimed for phosphorous reduction credit have been evaluated in the field and/or through analysis of available design plans. Pollutant removals for BMPs with available plans have been assessed according to the provided engineering design plans to estimate pollutant reductions provided. BMPs with no available plans were instead assessed in the field according to best engineering judgment. The Town cannot certify that BMPs assessed in the field are performing as originally designed, as design plans are not available. However, we feel that reasonable steps have been made to accurately quantify pollutant removals provided by existing stormwater BMPs. Additionally, the Town continues to follow its Operation and Maintenance Plan which includes annual inspections of Town-owned BMPs, with maintenance performed as needed such that they maintain proper working order consistent with state and federal stormwater guidance.

NON-TRADITIONAL AND TRANSPORTATION MS4s ONLY- municipalities please skip this section:

Describe the planned phosphorus reduction activities on site and coordination progress with the applicable municipality:

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 Town has determined it is subject to the following additional TMDL and Impaired Waters requirements:

- Cambridge Reservoir, chloride impaired waters requirements. (Appendix H, Part IV)
- Cambridge Reservoir Upper Basin, chloride impaired waters requirements. (Appendix H, Part IV)
- Elm Brook, bacteria impaired waters requirements. (Appendix H, Part III)
- Hobbs Brook, chloride impaired waters requirements. (Appendix H, Part IV)
- Shawsheen River, bacteria impaired waters requirements. (Appendix H, Part III)
- Unnamed Tributary, chloride impaired waters requirements. (Appendix H, Part IV)

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:**

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: Flyer, Be a Leaf Hero

Message Description and Distribution Method:

Distributed "Be a Leaf Hero" flyers during Fall 2023 season to educate residents about proper leaf disposal. Flyers were placed in the atrium of town hall and posted on the town's website.

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Distribute flyers through multiple avenues. Flyers were placed in the atrium of town hall and posted on the town's website.

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:

BMP: Website, Stormwater Information

Message Description and Distribution Method:

The Town maintains two stormwater websites, one with a variety of links and information pertaining to residents, businesses, and developers, and a second with specific information on the Town's MS4 program. Websites also provide seasonal messages that address lawn care, dog waste disposal, and snow/ice management for businesses.

<https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency>

<https://www.lincolntown.org/1122/Stormwater>

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Create a website and complete periodic updates.

Message Date(s): Continuous / Ongoing

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: Homeowners Guide to Protecting Ponds and Wetlands

Message Description and Distribution Method:

The Conservation Department distributed a two-page brochure entitled “Homeowners Guide to Protecting Ponds and Wetlands” which was available at their office and distributed at various public events staff attended.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute informational brochure to help protect wetlands and other resource areas at public events throughout the year.

Message Date(s): Varies

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: Flyer, Good Owners Make Good Dogs

Message Description and Distribution Method:

Distribute dog waste educational flyers called Good Owners Make Good Dogs which educated people on the importance of picking up after their dog and leashing them near sensitive wetland areas. This flyer was handed out to all residents who applied for a dog license in 2024 and posted on the Town's website..

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute educational messages to dog walkers utilizing the various trail system users.

Message Date(s): Continuous / Ongoing

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: Pet Waste Signage

Message Description and Distribution Method:

Dog waste educational signage is posted at 10 agricultural field entrances, at major trail heads, and around several elementary schools which outlined the Town’s dog rules including the importance of picking up dog waste

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Post educational pet waste signage at areas with high dog traffic. It is estimated that between 50 and 250 people see these signs every day.

Message Date(s): Continuous / Ongoing

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: Snow and Ice Management

Message Description and Distribution Method:

Provided information on snow and ice removal on the Town's website, as well as Lincoln's Salt Reduction Plan.

Targeted Audience: Businesses

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Make information available to the public on the importance of proper salt storage and application.

Message Date(s): Continuous / Ongoing

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: Septic System Maintenance

Message Description and Distribution Method:

Distributed a 1-page flyer entitled “Septic System Do's and Don'ts” included in all water bills in August 2023. Additionally, the Lincoln Water Department and Lincoln Board of Health includes a “Comprehensive Guide to Caring for Your Home Septic System” on its website.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission, Water Department, Board of Health

Measurable Goal(s):

Provide information on the Town's website and distribute a fact sheet to Town residents on the importance of proper septic system maintenance.

Message Date(s): August 2023 and Continuous / Ongoing

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: Homeowners Guide to Keeping Wetlands Healthy

Message Description and Distribution Method:

Distributed a 2-page flyer entitled “Homeowners Guide to Keeping Wetlands Healthy” included in the May 2024 water bill. It included tips on picking up dog waste, maintaining septic systems, planting a rain garden, and much more.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute a fact sheet to Town residents on the importance of protecting wetlands through proper management of stormwater runoff.

Message Date(s): May 2024

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 Quality and Watershed Protection

Message Description and Distribution Method:

The Conservation Director provide Stormwater Pollution Prevention Tips for Homeowners in her signature line on over 1,200 outgoing emails between August-November 2023 which included general tips to help reduce or prevent stormwater pollution.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Provide general information to those corresponding with the Conservation Commissioner on various water quality-related items or issues.

Message Date(s): Continuous / Ongoing

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:**

SWMP Plan for Download - The Town has posted the SWMP Plan and other relevant information on Town website along with contact information to allow for public comment.

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:**

-Held 5 virtual “Conservation Coffees” with approximately 30 residents in attendance – at each of these gatherings, stormwater education was included.
 -On February 22, 2024, Conservation staff gave a zoom presentation to Lincoln residents on the six-part mission of the Conservation Commission. We discussed how The Commission, and its staff protects wetlands, manages conservation land, acquires open space, and educates residents on various conservation matters (including stormwater).

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:

Number of SSOs removed:

MS4 System Mapping

Percent of Phase II map complete:

Optional: Provide additional status information regarding your map:

All known outfalls, stormwater BMPs, and receiving waterbodies with impairments have been mapped to date. Initial catchment delineations have also been completed based on topographic mapping and available stormwater system information, and are being refined as additional field information is collected during catchment investigations. The Town has also substantially mapped catch basins and manholes, and is working to complete mapping of piping connectivity. Mapping of open channel conveyances and interconnections with other MS4s (e.g. DOT) is ongoing, and it is expected that this will continue as part of DOT's own mapping efforts to be completed under a future TS4 permit. The Town is also working to identify data gaps in its drainage mapping (e.g., catch basins without piping, disconnected drainage networks, etc.) and is actively mapping and investigating these. Any new infrastructure discovered through this process will be mapped and screened as necessary by the end of Year 10.

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:

*Below, report on the percent of outfalls/interconnections screened **to date**.*

Percent of outfalls screened:

Optional: Provide additional information regarding your outfall/interconnection screening:

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:

*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:

The Town began assessing its catchment investigation status during Year 6. Many catchments do not have Key Junction Manholes, and the Town has no sewer system and corresponding System Vulnerability Factors that would require wet weather outfall sampling; thus catchment investigations are considered complete once outfalls have been screened for dry weather flow. Numbers provided above represents a combination of catchments screened during Year 6 as well as catchments that do not require investigations of Key Junction

Manholes or wet weather outfall screening, and thus are complete once dry weather outfall screening has been completed. Remaining catchments that require Key Junction Manhole investigations and/or wet weather outfall screening will be completed. by the end of Year 10.

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:

Number of illicit discharges removed:

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:

Total number of illicit discharges removed:

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:

An on-site IDDE training session was held on April 9, 2024 with applicable DPW staff. This session also provided training on Stormwater Pollution Prevention Plan (SWPPP) implementation and inspections at the DPW Garage.

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: 33

Number of inspections completed: 51

Number of enforcement actions taken: 11

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

The numbers above represent all reviews, inspections, and enforcement actions issued by the Town of Lincoln for all projects. Many of these are for projects far smaller than the 1-acre threshold. Major projects this year that were permitted and monitored during construction include: reconfiguration of Hanscom Drive, a tree clearing project on Baker Bridge Road, and the resurfacing of pathways and boardwalks at Minuteman National Historic Park. Major projects this year that have been approved and are pending construction include: installation of a Solar Facility on the Lincoln Transfer Station, and boat access and parking lot improvements at Walden Pond. “

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Date update was completed (due in year 3): Bylaw: May 15, 2021.
Regulations: July 27, 2021

Website of ordinance or regulatory mechanism:
General Bylaws: Article XXXI and Article XXXII, https://www.lincolntown.org/DocumentCenter/View/85207/Lincoln_IDDE_and_Stormwater_Management_Bylaw_FINAL
Regulations: Section 5, <http://www.lincolntown.org/DocumentCenter/View/883/Subdivision-Rules-and-Regs-amended-June-2014?bidId=>
<https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency>

As-built Drawings

Below, report on the number of as-built drawings received during this reporting period.

Number of as-built drawings received: 6

Optional: Enter any additional information relevant to the submission of as-built drawings:

As-built drawings received:

- Lincoln Public Schools, Ballfield Road
- 9-11 Lewis Street
- 263 Old Concord Road
- 31 Old Concord Road
- 76 Old Sudbury Road
- 8 Silver Hill Road

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:

No changes to date. To be determined pending discussions between various departments.

Green Infrastructure Report

Below, describe progress towards making green infrastructure practices allowable based on the report completed in Year 4:

No changes to date. To be determined pending discussions between various departments.

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):

- Pierce Park: Recommend the installation of 3 catch basins within the paved driveway area as well as the gravel parking area to the west. These catch basins will capture runoff and discharge it to the two existing ponds on site.
- Lincoln Fire Department and Police Station: Recommend the installation of two catch basins, two infiltration trenches, rain garden and detention basin to collect and treat runoff from the impervious areas surrounding the fire and police station.
- Lincoln Department of Public Works: Recommend the installation of a catch basin, connected to the existing catch basin network on site. Downgradient of the catch basins, install a subsurface sediment separator and an outfall into the wooded area south of the site. The separator should be cleaned regularly due to the presence of material stockpiles.

Conservation Parcel off of Trapelo Road: Recommend the installation of a manhole structure to intercept the main drainage line from Trapelo Road, and an infiltration basin to provide treatment.

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.

Since the 2016 MS4 Permit became effective, the following Town-owned facilities have been retrofitted with stormwater BMPs:

- Codman Community Farms: installation of a swale and raingarden
- Lincoln Public Schools: installation of three detention/infiltration basins, three underground infiltration systems, perforated pipe, and a stormtech chamber along with six other water quality units

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:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins:

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:

Volume of material removed:

Weight of material removed:

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:

Describe any corrective actions taken at a facility with a SWPPP:

Not applicable, no corrective actions have been taken to date.

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.

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 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: Title:

Signature: Date:

[Signatory may be a duly authorized representative]

Year 7 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2024-June 30, 2025

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, 2024 and June 30, 2025 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization:

EPA NPDES Permit Number:

Primary MS4 Program Manager Contact Information

Name: Title:

Street Address Line 1:

Street Address Line 2:

City: State: Zip Code:

Email: Phone Number:

Stormwater Management Program (SWMP) Information

SWMP Location (publicly available web address):

Date SWMP was Last Updated:

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) | | | |
| <input type="checkbox"/> Bacteria/Pathogens | <input checked="" type="checkbox"/> Chloride | <input type="checkbox"/> Nitrogen | <input type="checkbox"/> Phosphorus |
| <input checked="" type="checkbox"/> Solids/ Oil/ Grease (Hydrocarbons)/ Metals | | | |
| TMDL(s) | | | |
| <i>In State:</i> | <input type="checkbox"/> Assabet River Phosphorus | <input checked="" type="checkbox"/> Bacteria and Pathogen | <input type="checkbox"/> Cape Cod Nitrogen |
| | <input checked="" type="checkbox"/> Charles River Watershed Phosphorus | <input type="checkbox"/> Lake and Pond Phosphorus | |
| <i>Out of State:</i> | <input type="checkbox"/> Bacteria/Pathogens | <input type="checkbox"/> Metals | <input type="checkbox"/> Nitrogen |
| | | | <input type="checkbox"/> 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 7 Requirements

- Completed catchment investigations associated with Problem Outfalls
- Completed catchment investigations where information gathered on the outfall/interconnection indicated sewer input

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:

- 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 F and H 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:

Chloride

Annual Requirements

Public Education and Outreach

- Included an annual message in November/ December to private road salt applicators and commercial
 industrial site owners on the proper storage and application rates of winter deicing material, along with the steps that can be taken to minimize salt use and protect local waterbodies

The following type(s) of salt were applied **during this reporting period (year 7)**:

- Sodium chloride
- Calcium chloride
- Potassium chloride
- Magnesium chloride
- Brine solution

Total amount of salt applied **during this reporting period (year 7) including units:**

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:

Salt Reduction Plan - The Town only recently became aware of this requirement in Permit Year 3 when an updated 303(d) List of Impaired Waters was released, as Lincoln was not covered under a chloride impairment in the original 2016 permit release. Lincoln completed a Salt Reduction Plan during Year 5 to meet permit requirements and is available for download at: <https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency> and is currently working on completing additional salt reduction activities as feasible.

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:

Included as an appendix in the SWMP Plan, available for download at: <https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency>

- 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:

Increased Sweeping for High Pollutant Loads - This was determined not to be necessary for the Town as these areas are not observed to accumulate more sediment and debris than other areas within the Town.

Charles River Watershed Phosphorus TMDL

Below, calculate your current phosphorus export rate by first filling out the individual phosphorus loading components (labeled [A], [B], [C], and [D]) and then computing your current phosphorus export rate using the equation provided.

Baseline phosphorus export rate from PCP Area, as identified in Appendix F (lbs/year) [A]:

185

Total phosphorus reduction from all nonstructural controls implemented this reporting period (lbs/year) [B]:

15.1

Total phosphorus reduction from all structural controls installed this reporting period and all previous years (lbs/year) [C]:

2.01

Phosphorus load increase due to development incurred since 2005 in lbs/year [D]:

0

Current phosphorus export rate from the PCP Area in lbs/year [=A-(B+C)+D from above]:

168

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.

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

Implemented all nonstructural control measures during this reporting period and documented the measures and their phosphorus reduction. The nonstructural control measure information:

- is attached to the email submission
can be found at the following publicly available website:

Documented the structural control measures implemented during this reporting period and all previous years, including location, phosphorus reduction in mass/year, and date of last completed maintenance and inspection for each control. The structural control measure information:

- is not applicable; no structural control measures were implemented
is attached to the email submission
can be found at the following publicly available website:

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:

Stormwater BMPs being claimed for phosphorous reduction credit have been evaluated in the field and/or through analysis of available design plans. Pollutant removals for BMPs with available plans have been assessed according to the provided engineering design plans to estimate pollutant reductions provided. BMPs with no available plans were instead assessed in the field according to best engineering judgment. The Town cannot certify that BMPs assessed in the field are performing as originally designed, as design plans are not available. However, we feel that reasonable steps have been made to accurately quantify pollutant removals provided by existing stormwater BMPs. Additionally, the Town continues to follow its Operation and Maintenance Plan which includes annual inspections of Town-owned BMPs, with maintenance performed as

needed such that they maintain proper working order consistent with state and federal stormwater guidance.

The Town has not yet calculated increases in phosphorous load due to development since the baseline loading was calculated. The Town will update loading pending availability of updated land use data from publicly available sources that can be readily compared with previously released data.

The MS4 Permit requires the Town to reduce phosphorus loads to the Charles River, a portion of which comes from existing privately developed properties that discharge to the Town's MS4 or directly to surface waters. These existing private properties are currently not subject to stormwater permits and are not regulated to reduce their share of phosphorus contributions to TMDL waters. Instead, the Town is responsible for achieving phosphorus reductions from these private developments because these developments are located within Lincoln's MS4. The Town supports exploring a state or federal level stormwater permit for existing large commercial, industrial, and institutional properties located within the Charles River watershed to help mitigate impacts from development per EPA's August 13, 2020 stakeholder letter.

NON-TRADITIONAL AND TRANSPORTATION MS4s ONLY- municipalities please skip this section:

Describe the planned phosphorus reduction activities on site and coordination progress with the applicable municipality:

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 Town has determined it is subject to the following additional TMDL and Impaired Waters requirements:

- Cambridge Reservoir, chloride impaired waters requirements. (Appendix H, Part IV)
- Cambridge Reservoir Upper Basin, chloride impaired waters requirements. (Appendix H, Part IV)
- Elm Brook, bacteria impaired waters requirements. (Appendix H, Part III)
- Hobbs Brook, chloride impaired waters requirements. (Appendix H, Part IV)
- Shawsheen River, bacteria impaired waters requirements. (Appendix H, Part III)
- Unnamed Tributary, chloride impaired waters requirements. (Appendix H, Part IV)

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:**

*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: Website, Stormwater Information

Message Description and Distribution Method:

The Town maintains two stormwater websites, one with a variety of links and information pertaining to residents, businesses, and developers, and a second with specific information on the Town's MS4 program. Websites also provide seasonal messages that address lawn care, dog waste disposal, and snow/ice management for businesses.
<https://www.lincolntown.org/1010/Stormwater-and-Climate-Resiliency>
<https://www.lincolntown.org/1122/Stormwater>

Targeted Audience: Residents, Businesses, Institutions, Commercial Facilities, Developers (construction)

Responsible Department/Parties: Conservation Commission, Information Technology

Measurable Goal(s):

Create a website and complete periodic updates.

Message Date(s): Continuous / Ongoing

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: Flyer, Good Owners Make Good Dogs

Message Description and Distribution Method:

Distribute dog waste educational flyers called Good Owners Make Good Dogs which educated people on the importance of picking up after their dog and leashing them near sensitive wetland areas. This flyer was handed out to all residents who applied for a dog license in 2025 and posted on the Town's website..

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute educational messages to dog walkers utilizing the various trail system users.

Message Date(s): Continuous / Ongoing

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: Pet Waste Signage

Message Description and Distribution Method:

Dog waste educational signage is posted at 10 agricultural field entrances, at major trail heads, and around several elementary schools which outlined the Town’s dog rules including the importance of picking up dog waste.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Post educational pet waste signage at areas with high dog traffic. It is estimated that between 50 and 250 people see these signs every day.

Message Date(s): Continuous / Ongoing

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: Homeowners Guide to Protecting Ponds and Wetlands

Message Description and Distribution Method:

The Conservation Department distributed a two-page brochure entitled “Homeowners Guide to Protecting Ponds and Wetlands” which was available at their office and distributed at various public events staff attended.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Distribute informational brochure to help protect wetlands and other resource areas at public events throughout the year.

Message Date(s): Continuous / Ongoing

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: Snow and Ice Management

Message Description and Distribution Method:

Provided information on snow and ice removal on the Town's website, as well as Lincoln's Salt Reduction Plan.

Targeted Audience: Businesses

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

The Conservation Department sent a memo and brochure to over 30 business owners and property owners regarding Snow and Ice Management Strategies.

Message Date(s): December 2024, and Continuous / Ongoing

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: Septic System Maintenance

Message Description and Distribution Method:

Lincoln Water Department and Lincoln Board of Health includes a "Comprehensive Guide to Caring for Your Home Septic System" on its website.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission, Water Department, Board of Health

Measurable Goal(s):

Provide information on the Town's website and distribute a fact sheet to Town residents on the importance of proper septic system maintenance.

Message Date(s): Spring 2025 and Continuous / Ongoing

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 Quality and Watershed Protection

Message Description and Distribution Method:

The Conservation Director provide a variety of stormwater pollution prevention tips in her signature line on hundreds of outgoing emails throughout the year.

- July through August 2024 included information on the importance of picking up after pets.
- September through November 2024 included information on the importance of removing leaf litter.
- December through February addressed residential salt storage and cleanup.
- March through June addressed a variety of miscellaneous pollution prevention tips.

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):

Provide general information to those corresponding with the Conservation Commissioner on various water quality-related items or issues.

Message Date(s): Continuous / Ongoing

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: Flyer, Tips for Saving Water

Message Description and Distribution Method:

Distributed a 1-page flyer entitled "Tips for Saving Water" included in the May 2025 water bill. It included tips on limiting lawn watering and much more

Targeted Audience: Residents

Responsible Department/Parties: Conservation Commission

Measurable Goal(s):
Distribute a fact sheet tot Town residents on the importance of saving water through proper management.

Message Date(s): Spring 2025

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:**

SWMP Plan for Download - The Town has posted the SWMP Plan and other relevant information on Town website along with contact information to allow for public comment.

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:**

On April 29, 2025, Conservation staff attended a culvert replacement training in Weston to learn about prioritizing stormwater management and culvert replacements.

Held 10 in-person trail walks and 1 virtual "Conservation Coffce" with approximatcly 12 residents in attendance at each event - stormwater education was included.

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:

Number of SSOs removed:

MS4 System Mapping

Percent of Phase II map complete:

Optional: Provide additional status information regarding your map:

All known outfalls, stormwater BMPs, and receiving waterbodies with impairments have been mapped to date. The Town has also substantially mapped all known stormwater infrastructure, including catch basins, manholes, pipes, and other miscellaneous infrastructure. Mapping of interconnections with other MS4s (e.g. DOT) is ongoing, and it is expected that this will continue as part of DOT's own mapping efforts to be completed under a future TS4 permit. Any new infrastructure discovered through this process will be mapped and screened as necessary by the end of Year 10.

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:

Below, report on the percent of outfalls/interconnections screened **to date.**

Percent of outfalls screened:

Optional: Provide additional information regarding your outfall/interconnection screening:

All known outfalls have been screened during dry weather. As/if additional outfalls are located, they are screened during dry weather for potential illicit discharges.

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:

*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:

The Town began assessing its catchment investigation status during Year 6. Many catchments do not have Key Junction Manholes, and the Town has no sewer system and corresponding System Vulnerability Factors that would require wet weather outfall sampling; thus catchment investigations are considered complete once outfalls have been screened for dry weather flow. Numbers provided above represents a combination of catchments screened during Year 7 as well as catchments that do not require investigations of Key Junction Manholes or wet weather outfall screening, and thus are complete once dry weather outfall screening has been completed. Remaining catchments that require Key Junction Manhole investigations and/or wet weather outfall screening will be completed. by the end of Year 10.

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:

Number of illicit discharges removed:

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:

Total number of illicit discharges removed:

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:**

An on-site IDDE training session was held on June 26, 2025 with applicable DPW staff. This session also provided training on Stormwater Pollution Prevention Plan (SWPPP) implementation and inspections at the DPW Garage.

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:

Number of inspections completed:

Number of enforcement actions taken:

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

Six new enforcement orders were issued in FY25 on minor work in the buffer zone, which resulted in erosion control stabilization and/or restoration.

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:

Optional: Enter any additional information relevant to the submission of as-built drawings:

As-built drawings were submitted for the following projects:

-76 Old Sudbury Road
 -191 Weston Road
 -65 Winter Street
 -80 Birchwood Lane
 -61 Conant Road
 -22 Lincoln Road
 -263 Old Concord Road
 -247 Old Concord Road
 -Two MMNHP as-builts for boardwalk construction and trail repairs

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:

No changes made to date. To be determined upon final release of the upcoming revised Phase II Permit and pending discussions between various departments and boards.

Green Infrastructure Report

Below, describe progress towards making green infrastructure practices allowable based on the report completed in Year 4:

No changes made to date. To be determined upon final release of the upcoming revised Phase II Permit and pending discussions between various departments and boards.

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):

Pierce Park: Recommend the installation of 3 catch basins within the paved driveway area as well as the gravel parking area to the west. These catch basins will capture runoff and discharge it to the two existing ponds on site.

Lincoln Fire Department and Police Station: Recommend the installation of two catch basins, two infiltration trenches, rain garden and detention basin to collect and treat runoff from the impervious areas surrounding the fire and police station.

Lincoln Department of Public Works: Recommend the installation of a catch basin, connected to the existing catch basin network on site. Downgradient of the catch basins, install a subsurface sediment separator and an

outfall into the wooded area south of the site. The separator should be cleaned regularly due to the presence of material stockpiles.

Conservation Parcel off of Trapelo Road: Recommend the installation of a manhole structure to intercept the main drainage line from Trapelo Road, and an infiltration basin to provide treatment. Construction is anticipated to occur during Year 8.

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.

Since the 2016 MS4 Permit became effective, the following Town-owned facilities have been retrofitted with stormwater BMPs:

- Codman Community Farms: installation of a swale and raingarden
- Lincoln Public Schools: installation of three detention/infiltration basins, three underground infiltration systems, perforated pipe, and a stormtech chamber along with six other water quality units.

As noted above, construction of the Trapelo Road drainage improvements are anticipated to occur during Permit Year 8.

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:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

Below, report on the total number of catch basins in the MS4 system.

Total number of catch basins:

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:
- Volume of material removed: [Select Units]
- Weight of material removed:

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:

Describe any corrective actions taken at a facility with a SWPPP:

Not applicable, no corrective actions have been taken to date.

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 8

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 8 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 8 below:

Part V: Certification of Small MS4 Annual Report 2025

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: Timothy S. Higgins

Title: Town Administrator

Signature: Tim S Higgins

Date: 09/22/25

[Signatory may be a duly authorized representative]