

NPDES Phase II Stormwater Program
Automatically Designated MS4 Areas

Danvers MA

Regulated Area:

UA Based on 2000 Census	UA Based on 2010 Census
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Town Population: **26461**
Regulated Population: **26461**
(Populations estimated from 2010 Census)

Urbanized Areas, Town Boundaries:
1st Census (2000, 2010)
Base map © 2013 Microsoft Corporation and its data suppliers
US EPA Region 1 GIS Center Map #9824, 8/6/2013

Tighe & Bond

Stormwater Management Plan

Prepared For:

Town of Danvers, MA

November 2018

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Section 1

Introduction

Danvers is located in Essex County along the northeastern coast of Massachusetts, approximately 20 miles north of Boston. It is abutted by the City of Beverly to the east, the Towns of Wenham and Topsfield to the north, the Town of Middleton to the west, and the City of Peabody to the south. There are approximately 0.8 square miles of water within its 14.1 square mile footprint.

According to the 2010 United States (U.S.) Census, Danvers is home to approximately 26,500 residents in more than 10,600 households.

Protecting the quality of Danvers' water resources, including lakes, ponds, rivers, and groundwater supplies is a priority for the Town of Danvers. Pollutants from stormwater runoff are a contributing factor to the impairment of Danvers' waterbodies, including low dissolved oxygen levels and bacterial contamination. The Town has developed stormwater policy initiatives, provided education to its businesses and citizens, publicly discussed the issues related to stormwater runoff, and offered many opportunities for residents and businesses to pitch in with clean-up efforts.



Figure 1-1 Location of Danvers, Massachusetts

1.1 Purpose of this Plan

In an on-going effort to minimize stormwater impacts within Danvers, the Town has developed this Stormwater Management Plan (SWMP). The SWMP is required by the U.S. Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System (NPDES) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) in Massachusetts ("Small MS4 General Permit"). The SWMP describes and details the activities and measures that will be implemented by Danvers to meet the terms and conditions of the permit.

The SWMP will be updated and/or modified during the permit term as the Town's activities are modified, changed, or updated to meet permit conditions. Other requirements of the Small MS4 General Permit, such as a Notice of Intent (NOI), Authorization to Discharge letter, and documentation showing Endangered Species Act and Historic Properties eligibility criteria have been certified and are located in the Appendices of this Plan.

1.2 Regulatory Requirements

1.2.1 Overview of EPA's NPDES MS4 Program

Through the NPDES program, the EPA nationally regulates the discharge of stormwater runoff that is transported into local water bodies via MS4s. EPA's MS4 stormwater program was enacted in two phases:

- Phase I, issued in 1990, requires *medium* and *large* cities or certain counties with populations of 100,000 or more to obtain NPDES permit coverage for their stormwater discharges.
- Phase II, issued in 1999, requires regulated *small* MS4s in urbanized areas, as well as small MS4s outside the urbanized areas that are designated by the permitting authority, to obtain NPDES permit coverage for their stormwater discharges.

A **municipal separate storm sewer system (MS4)** is a conveyance or system of conveyances that is:

- owned by a state, city, town, village, or other public entity that discharges to waters of the U.S.,
- designed or used to collect or convey stormwater (e.g., storm drains, pipes, ditches),
- not a combined sewer, and
- not part of a sewage treatment plant, or publicly owned treatment works (POTW).

In Massachusetts, the EPA Region 1 and the Massachusetts Department of Environmental Protection (MassDEP) jointly administer the municipal stormwater program. EPA and MassDEP originally authorized Danvers to discharge stormwater in 2003 under a *NPDES General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems*, known as the "2003 General Permit." Under this permit, the Town has developed and implemented a Stormwater Management Program to reduce the contamination of stormwater runoff.

The 2003 General Permit expired in May 2008 but remained in full force and effect until a replacement permit was issued on April 13, 2016. The reissued NPDES *General Permit for Stormwater Discharges from Small MS4 in Massachusetts* substantially increases stormwater management requirements and mandates specific timelines for compliance. On June 30, 2017, an EPA stay delayed the effective date of the General Permit until July 1, 2018. The MassDEP also adopted this delayed effective date.

This SWMP was developed to be consistent with the requirements of the 2016 Small MS4 General Permit for Massachusetts. Once implemented, the SWMP described herein will satisfy the requirements for compliance under the 2016 General Permit.

The new General Permit is intended to be more prescriptive than the 2003 General Permit, and to build upon the regulations already in place. The new General Permit substantially increases stormwater management requirements and mandates specific timelines for compliance. A few of the major differences for each minimum control measure are summarized in the following points:

- **Public Education and Outreach:** More specific messages required and prescriptive deadlines compared to the 2003 General Permit.

- **Public Involvement and Participation:** No substantial change from the 2003 General Permit.
- **Illicit Discharge Detection and Elimination (IDDE) Program:** Complete drainage system mapping, building on outfall mapping developed under the 2003 General Permit. Add interconnections to the outfall inventory. Delineate catchment areas and prioritize catchment investigations. Perform dry weather screening and sampling of high priority and low priority MS4 interconnections and outfalls by the end of Year 3. Perform wet weather screening in the spring for the catchments that indicate the presence of one or more System Vulnerability Factors. Complete catchment investigations. For impaired waters without Total Maximum Daily Loads (TMDLs), implement a multi-step approach to address the discharges including BMPs, source identification, and an evaluation of retrofit feasibility.
- **Construction Site Stormwater Runoff Control:** If it does not already exist, add inspection and enforcement to the site plan review procedure.
- **Stormwater Management in New Development and Redevelopment:** For new development, retain the first 1 inch of runoff from all impervious surfaces on site, or provide pollutant removal with a BMP. For redevelopment, retain the first 0.80 inches of runoff from all impervious surfaces on site or provide pollutant removal with a BMP. Offsite mitigation may be used for redevelopment projects. Evaluate local code for consistency with smart growth principles and green infrastructure.
- **Good Housekeeping and Pollution Prevention:** Develop a program to repair and rehabilitate the MS4 infrastructure. Sweep/clean municipal streets once in the spring. Include all activities that occur at a municipal facility and potential pollutants associated with each activity in the stormwater pollution prevention plan (SWPPP) for the facility.

1.3 Summary of Danvers' Stormwater Management Program under the 2003 Small MS4 General Permit

The Town of Danvers meets EPA's regulatory threshold for Phase II of the MS4 program, and therefore is required to be covered under a NPDES permit for its stormwater discharges from the MS4 in its Urbanized Area. The Town of Danvers is charged by the EPA with operating and maintaining its MS4 to manage stormwater runoff, as well as to protect public health and safety, preserve environmental resources, and safeguard town character.

Urbanized Areas (also known as "regulated areas") are defined by the latest U.S. decennial census. On March 26, 2012, the Census Bureau published the final listing of urbanized areas for the 2010 census. An urbanized area encompasses a densely settled territory that consists of core census block groups or blocks that have a population of at least 1,000 people per square mile and surrounding census blocks that have an overall density of at least 500 people per square mile or are included to link outlying densely settled territory

with a densely settled urban core.¹ According to EPA Region 1, the area covered by either the 2000 census or the 2010 census are regulated by EPA under the MS4 program. Therefore, all of Danvers is regulated, as seen in Figure 1-2, and the SWMP must be implemented within the entire Town.²

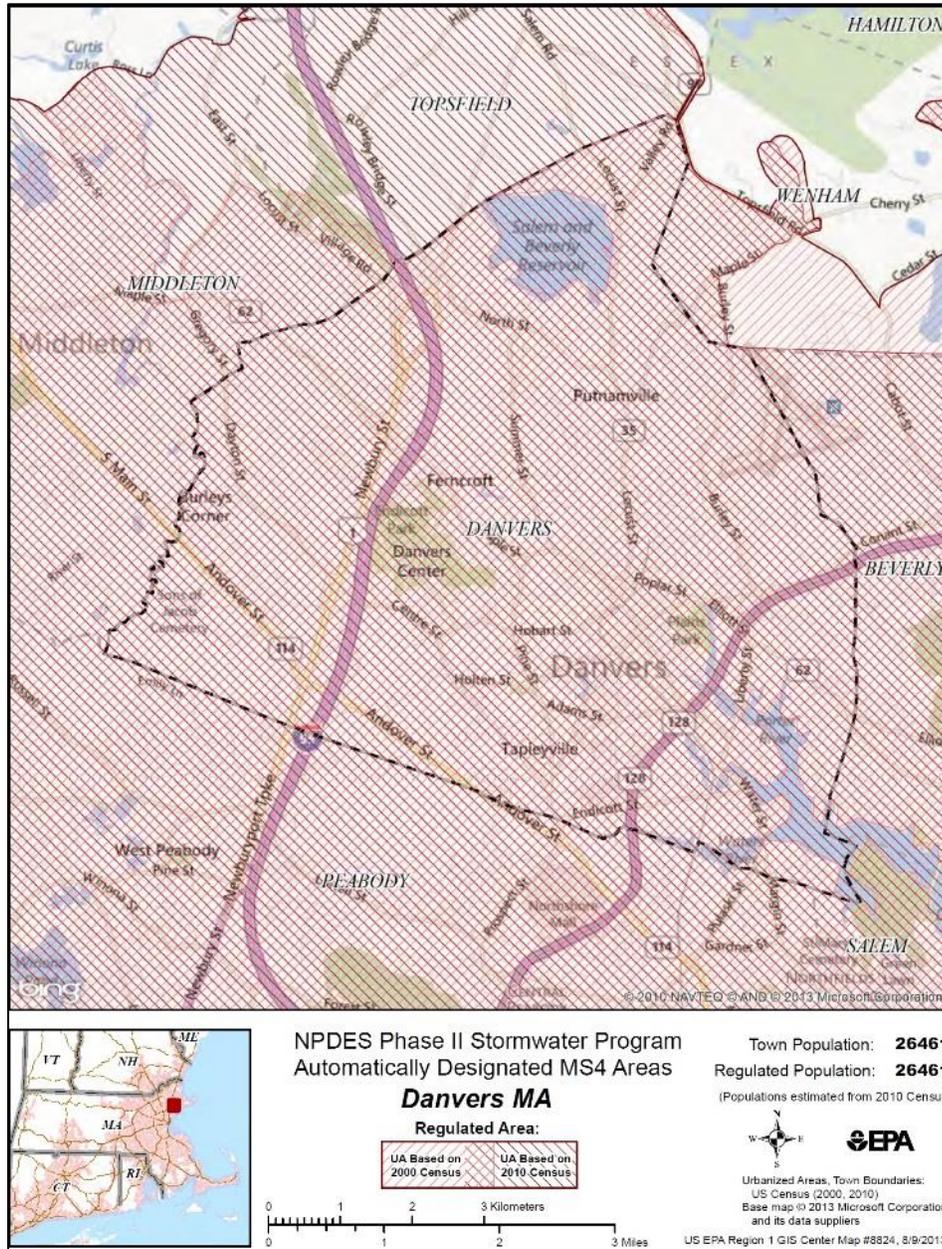


Figure 1-2 Town of Danvers’ Urbanized Area based on 2000 and 2010 census

¹ U.S. EPA. *Fact Sheet: Draft General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts*. September 2014. For a complete definition of Urbanized Area see Federal Register, August 24, 2011. Vol. 76 No. 164 p. 53030. URL: <http://www2.census.gov/geo/pdfs/reference/fedreg/fedregv76n164.pdf>.

² U.S. EPA, 2014.

Danvers' stormwater management program is managed within the Department of Public Works (DPW). Currently, stormwater management tasks are carried out by various Town departments and volunteer boards, including the Streets Department, Water and Sewer Department, Health Department, and the Planning Board.

The Town of Danvers has achieved all of the measurable goals for the BMPs selected in the 2003 Notice of Intent and those added in subsequent years to reflect unplanned stormwater activities by the Town. The following paragraphs include brief descriptions of current practices the Town undertakes as part of its Stormwater Management Program.

1.3.1 MCM 1 - Public Education and Outreach

The Town has been able to provide a robust multi-media public education program related to nonpoint source pollution and stormwater management targeted at multiple audiences. The Town has achieved this by distributing educational and outreach materials at community events (i.e., Earth Day Recycling events, Household Hazardous Waste Day, and with mailed and in-person dog license renewals) and on social media (i.e., a #StormwaterMatters campaign), incorporating educational programs into the local elementary schools, subscribing to the Greenscapes North Shore program, publishing SWMP articles in the Town's newsletter and with water bills, installing storm drain markers, and discouraging pet waste through signage, the installation of dog waste stations, and the creation of a dog park.

1.3.2 MCM 2 – Public Involvement and Participation

Notice of public meetings complies with State and Local public meeting notice requirements and there are opportunities for residents of all ages to participate in Danvers' stormwater program and overall environmental stewardship. This includes Sandy Beach clean-ups, installation of catch basin stenciling, and middle school calendar contests. The Town posts opportunities for stormwater related community service activities on the high school bulletin and many students have participated in the Town events. The Town formed a stormwater advisory committee and held their first meeting in January 2003. The committee meets as needed to discuss issues related to stormwater.

1.3.3 MCM 3 – Illicit Discharge and Detection Elimination

Danvers has spent considerable effort on their IDDE Program. The Town has satisfied the mapping requirements of the 2003 General Permit and is well on the way to meeting the requirements in the 2016 Small MS4 General Permit. Danvers has mostly completed mapping its MS4 system, identified priority areas for additional work, developed procedures for locating illicit discharges, and performed an outfall inventory and dry weather screening (sampled, mapped, and photographed) at all of their outfalls identified by a 2012 CDM Smith Report³ as being hydrologically connected to waters of the United States. The Town updates the GIS-based mapping with drainage infrastructure recently installed or rehabilitated and has deployed iPads to their Street Supervisor and Water Foreman so that additional system upgrades can be recorded as they are completed.

In 2011 Danvers adopted *Bylaws to Regulate Illicit Discharges to the Municipal Storm Drain System*, which regulates illicit discharges and illegal connections to the MS4. The DPW serves as the enforcement agency and has developed a spill response plan to handle

³ CDM Smith. Dry Weather Outfall Screening and Illicit Discharge Detection and Elimination (IDDE) Program. April 2012.

and track spills and a spot repair program to address illicit connections once they are identified. The program requires that all sewer service connections be inspected by the Town prior to backfilling.

Town Staff have been trained, and are provided regular training opportunities, on illicit discharges and stormwater outfall investigations and sampling. Town staff look for the presence of illicit discharges during regular DPW operations activities.

1.3.4 MCM 4 – Construction Site Stormwater Runoff Control and MCM 5 – Post-Construction Stormwater Management

Danvers adopted the *Stormwater and Land Disturbance Bylaw* in 2011 and associated regulations in 2012. The Bylaw and regulations require that all new development and redevelopment projects greater than one acre of land disturbance must obtain a stormwater permit, meet performance standards, and implement a management plan or face penalties. In addition, new projects disturbing one acre of land or greater require a public hearing and implementation of erosion and sediment controls. The Town also manages construction solid waste by sending out permits to garbage haulers to require dumpster registrations.

In addition, the Town of Danvers Zoning Bylaws address stormwater construction issues through site plan review requirements. Procedures for site plan reviews are established and enforced, and reviews and inspections by the DPW, Planning Board, Building Inspector, and Conservation Commission are conducted. These reviews include regular inspections and communication with the developer to ensure adherence to local requirements during construction, specifically erosion and sediment controls.

The Town also implements post-construction best management practices (BMPs) maintenance based on the *Stormwater and Land Disturbance Bylaw* and associated regulations. These regulations highlight private BMP operation and maintenance procedures including maintenance and inspection reporting.

1.3.5 MCM 6 – Pollution Prevention and Good Housekeeping

The Town implements Good Housekeeping Standard Operating Procedures and employee training for numerous actions to reduce pollutant runoff from municipal operations, including catch basin cleaning, street sweeping, staff training, storing oil and hazardous materials properly, covering winter deicing materials, vehicle washing and maintenance, park and landscape maintenance, culverts and outfall cleaning, and implementing a Good Housekeeping Plan, DPW Yard Stormwater Pollution Prevention Plan, and an Oil Spill Prevention, Control, and Countermeasure (SPCC) Plan.

1.3.6 Additional Permit Requirements

Groundwater Recharge and Infiltration: Through implementation of the Stormwater and Land Disturbance Bylaw, Wetlands Bylaw and Regulations, and Zoning Bylaws the Town evaluates site conditions relative to stormwater infiltration. Additionally, the Town of Danvers Zoning Bylaw includes infiltration design requirements in the Groundwater Protection District which promote surface infiltration and require artificial recharge when lot impervious exceeds specific percentages.

Public Drinking Water Supply Requirements: The Town of Danvers Zoning Bylaw Groundwater Protection District Bylaw ensures adequate drinking water quality and quantity, preserves and protects drinking water supplies, conserves natural resources, and prevents contamination of the environment. The Town considers water supply sources and protection areas a priority for stormwater management, particularly IDDE activities.

Record Keeping: The Town of Danvers maintains stormwater management program records that are organized by year and are stored in both paper and digital format.

Water Quality Impaired Waters and Total Maximum Daily Load (TMDL) Allocations: Danvers' stormwater program is addressing many of the current requirements for discharges to impaired waterbodies. Through implementation of its current stormwater program, the Town is addressing the discharge of the pollutants of concern.

1.3.7 Building on 2003 BMPs

According to Section 1.10.b of the 2016 General Permit, Danvers must modify or update the BMPs being implemented under the 2003 General Permit to meet the terms and conditions of part 2.3 of the new General Permit. Appendix B includes a list of BMPs completed under the 2003 Small MS4 General Permit and BMPs included in the Notice of Intent and SWMP which comply with the 2016 Small MS4 General Permit. This list identifies how the intent of each 2003 BMP is being met under the 2016 BMPs (further description of 2016 BMPs is included in Section 3 of this SWMP).

1.4 General Eligibility Determination

Section 1.2.1 of the Small MS4 General Permit authorizes the discharge of stormwater from small MS4s if the MS4 is determined to meet general eligibility criteria:

- *Small MS4 within the Commonwealth of Massachusetts*

The Town of Danvers is located within Essex County, Massachusetts.

- *Not a large or medium MS4 as defined in 40 CFR 122.26(b)(4) or (7)*

The population of Danvers is 26,500 according to the 2010 Census, the MS4 is not within a designated County, and the Town has not been designated by the Director as part of a large or medium MS4.

- *Located either fully or partially within an urbanized area as determined by the 2010 Census or located in a geographic area designated by EPA as requiring a permit*

Figure 1-2 shows the Regulated MS4 Areas for the Town of Danvers, based on 2000 and 2010 census listings. Danvers is fully within an urbanized area.

1.5 Special Eligibility Determinations

1.5.1 Endangered Species

On behalf of the Town of Danvers, Tighe & Bond completed the National Endangered Species Eligibility Determination screening process in accordance with Part 1.9.1 and Appendix C of the Small MS4 General Permit, and determined that the Town of Danvers meets **Criterion B**, where it has been determined that the Town's stormwater discharges and discharge related activities are "not likely to adversely affect" any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the US

Fish and Wildlife Service.⁴ Refer to Appendix C of the SWMP for supporting information, including the US Fish and Wildlife Service IPaC Official Species List for the project area and the Endangered Species Act Certification.

1.5.2 Historic Properties

On behalf of the Town of Danvers, Tighe & Bond completed the National Historic Preservation Act Eligibility Determination screening process in accordance with Part 1.9.2 and Appendix D of the Small MS4 General Permit and determined that the Town of Danvers meets **Criterion A**, as the discharges do not have the potential to cause effects on historic properties. Please refer to Appendix D of the SWMP for supporting information, including a list of the federal- and state-listed historic areas, buildings, burial grounds, objects, and structures in the Town of Danvers' regulated area downloaded from the Massachusetts Cultural Resource Information System (MACRIS).

1.6 Authorization for Danvers to Discharge Stormwater

As required by the General Permit, a NOI was submitted within 90 days of the effective date of the permit. A copy of the NOI is included in Appendix A. Documentation of the Town of Danvers' Authorization to Discharge by EPA will also be provided in Appendix A once issued by EPA. This written SWMP must be finalized within one year of the effective date of the permit.

⁴ Note that the Town's NOI, submitted to EPA and MassDEP in September 2018, certified that the Town met Criterion C, where stormwater discharges will have "no affect" on listed species or critical habitat. Upon further review of the listed species in Danvers and the applicable guidance in Appendix C of the General Permit, it was determined that the Town met Criterion B. See Appendix C of this SWMP for the supporting documentation for each criterion.

Section 2

Watershed Resources

2.1 Watershed Inventory

The Town of Danvers, Massachusetts is located within the Ipswich River and the North Coastal Watershed, and ultimately drains to Massachusetts Bay, as shown in Figure 2-1.

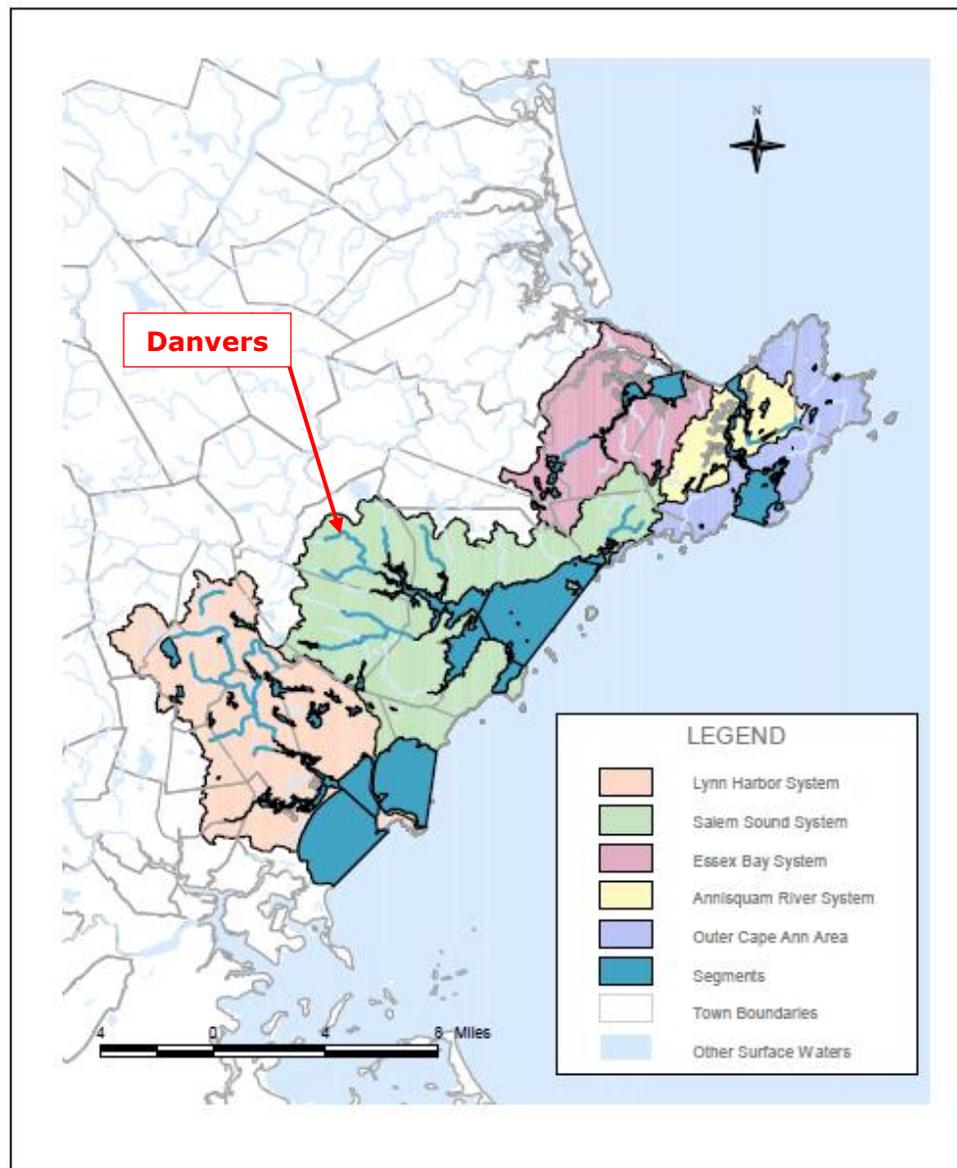


Figure 2-1 Major drainage areas in North Coastal Watersheds⁵

⁵ North Shore Coastal Watersheds 2002 Water Quality Assessment Report
Town of Danvers Stormwater Management Program

The Ipswich River Watershed is located in northeastern portion of Massachusetts and extends to the Atlantic Ocean, as shown in Figure 2-2. The watershed is bordered by the North Coastal Watershed to the southeast. The Putnamville Reservoir, a 283-acre waterbody located within Danvers, is a well-known water feature in the Ipswich River watershed and a water supply for the nearby towns of Salem and Beverly. Table 2-1 identifies the natural drainage basins within the Town of Danvers for waterbodies that are included in the 2014 Integrated List of Waters (see discussion in Section 2.2 for additional information). Note that there may be additional waterbodies within Town that are not included in the Integrated List.

Table 2-1
Natural Drainage Basins within the Town of Danvers, Massachusetts

Major Basin	Main Stem Basin
Ipswich River Watershed	MA92-06 – Ipswich River
	MA92-11 – Norris Brook
	MA92-25 – Nichols Brook
	MA92052 - Putnamville Reservoir
North Coastal Watershed	MA93-02 – Crane Brook
	MA93-36 – Frost Fish Brook
	MA93-37 – Beaver Brook
	MA93-01 – Waters River
	MA93-04 – Porter River
	MA93-09 – Danvers River
	MA93-41 – Crane River
MA93-38 – Crane River	

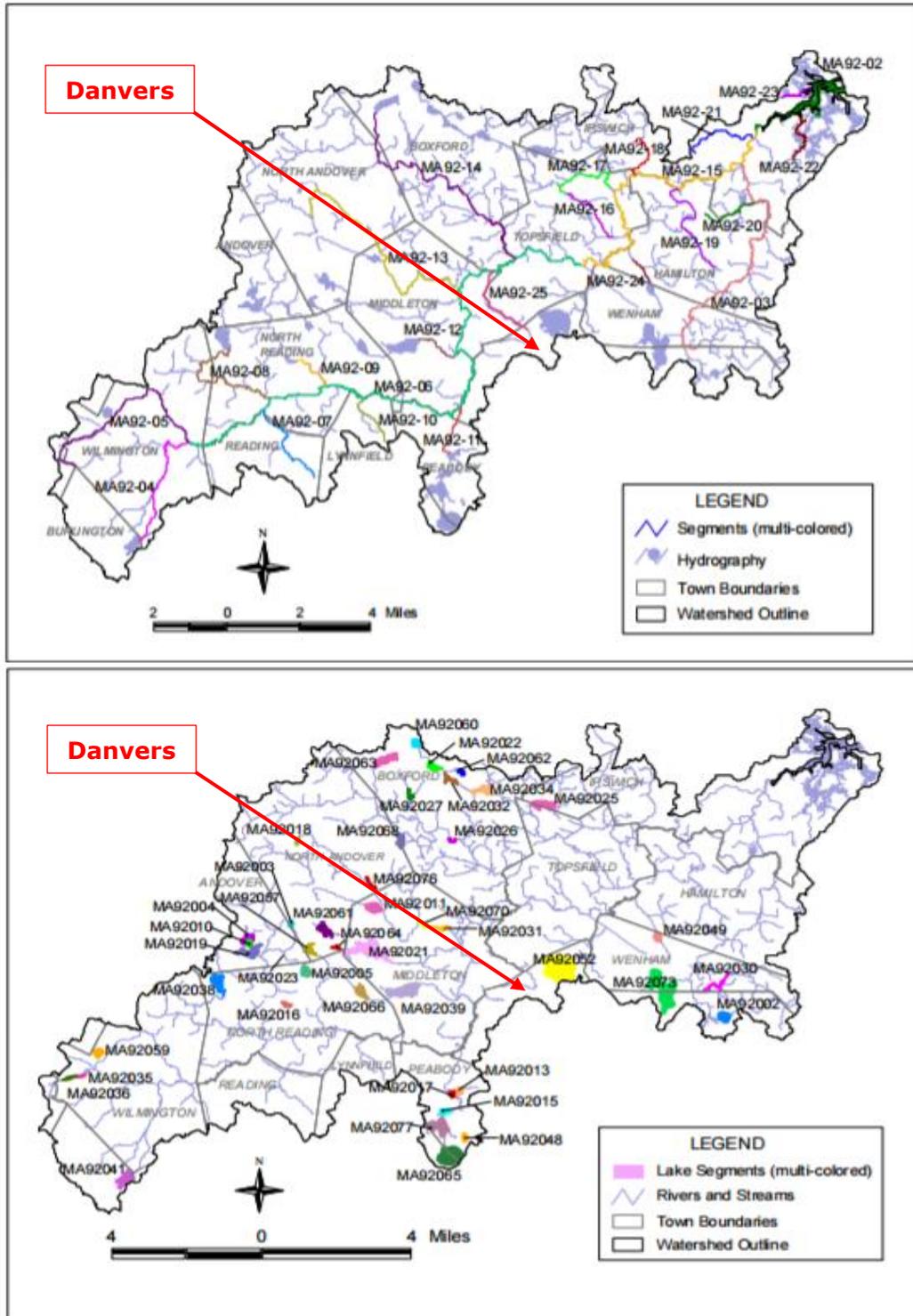


Figure 2-2 Ipswich River Watershed River and Lake Segments⁶

⁶ MassDEP, Division of Watershed Management, "Ipswich River Watersheds 2000 Water Quality Assessment Report". April 2014. Accessed online June 2017 at: <http://www.mass.gov/eea/docs/dep/water/resources/71wqar09/92wqar.pdf>

2.2 Water Quality

To meet the requirements of the Clean Water Act (CWA) Section 303(d), Massachusetts must assess and categorize surface waterbodies for attainment of designated uses (such as habitat for aquatic wildlife, aquatic wildlife consumption, and primary and secondary recreation), as well as identify any waterbodies that are not expected to meet surface water quality standards after implementation of controls. These sources are prioritized for establishing TMDLs for use in permit setting. Massachusetts meets the CWA reporting requirements through the development of an Integrated List of Waters, in which waters in the Commonwealth are categorized for attainment of designated uses. The Integrated List assigns each waterbody or waterway with one of five categories:

- **Category 1:** waters that are unimpaired and not threatened for all designated uses
- **Category 2:** waters that are unimpaired for some uses and not assessed for others
- **Category 3:** waters with insufficient information to make assessments for any uses
- **Category 4a:** waters with a completed TMDL
- **Category 4c:** waters that are impaired or threatened for one or more uses, but not by a pollutant and therefore not requiring the calculation of a TMDL
- **Category 5:** waters that are impaired or threatened for one or more uses and requiring a TMDL

Waterbodies classified as Category 4a (waterbodies with a TMDL) and Category 5 (“water quality limited” waterbodies) do not meet CWA designated uses, and stormwater pollutants of concern will need to be addressed per General Permit requirements.

Water quality within the Ipswich Watershed and North Coastal River Watershed was assessed by the Massachusetts Department of Environmental Protection, Division of Watershed Management in 2000⁷ and 2002⁸, respectively. See the applicable MassDEP reports for further information.

⁷ MassDEP, Division of Watershed Management, “Ipswich River Watersheds 2000 Water Quality Assessment Report”.

⁸ MassDEP, Division of Watershed Management, “North Coastal River Watersheds 2002 Water Quality Assessment Report”.

2.2.1 2014 Integrated List of Waters

As of the date of this SWMP, Massachusetts waters categorized as impaired surface waters were identified in the Final Massachusetts Year 2014 Integrated List of Waters.⁹ Waterbodies identified on Integrated List within Danvers are listed in Table 2-2.

Table 2-2

Summary of 2014 Integrated List of Waters - Status of Danvers' Receiving Waters

Category 5 Waters: waters requiring a TMDL						
Indicator contributing to impairment:	Beaver Brook MA93-37		Ipswich River MA92-06		Norris Brook MA92-11	
Dissolved Oxygen	X		X		X	
Mercury in Fish Tissue*			X			
Low Flow Alterations*			X			
Total Suspended Solids (TSS)					X	
Turbidity					X	
Category 4a Waters: TMDL is completed						
Indicator contributing to impairment:	Crane Brook MA93-02	Crane River MA93-41	Danvers River MA93-09	Frost Fish Brook MA93-36	Porter River MA93-04	Waters River MA93-01
Fecal Coliform	X	X	X	X	X	X
Category 3 Waters: no uses assessed						
Nichols Brook MA92-25			Putnamville Reservoir MA92052			
Category 2 Waters: attaining some uses; other uses not assessed						
Uses attained:				Crane River MA93-38		
Aesthetic				X		
Fish, other Aquatic Life and Wildlife				X		
Primary Contact Recreation				X		
Secondary Contact Recreation				X		

*TMDL not required (Non-pollutant)

Note that a draft 2016 Integrated List of Waters is available from MassDEP but has not been finalized and therefore is not yet the official EPA 303(d) list. Compared to the 2014 Integrated List of Waters for impaired waters in Danvers, the 2016 Integrated List of Waters includes the following changes:

- Adds enterococcus as a final TMDL to Category 4a water Porter River (MA93-04)

⁹ MassDEP, Bureau of Water Resources "Final Massachusetts Year 2014 Integrated List of Waters". December 2015. Accessed online November 2016 at: <http://www.mass.gov/eea/docs/dep/water/resources/07v5/14list2.pdf>.

- Adds E. coli as a final TMDL to Category 4a waters Frost Fish Brook (MA93-36) and Crane Brook (MA93-02)
- Removes total suspended solids and turbidity impairments from Category 5 water Norris Brook (MA92-11)
- Adds E. coli as an impairment to Category 5 water Beaver Brook (MA93-37)
- Adds Crane River (MA93-38) as a Category 5 water impaired by E. coli (previously Category 2 water)

2.2.2 Pollutants of Concern

Based on the 2014 Integrated List of Waters, the pollutants of concern for Danvers' impaired waters related to stormwater include bacteria, solids, and dissolved oxygen concentrations. More information about these pollutants and their potential sources are included in Appendix E.

2.2.3 Applicable TMDLs

Several waterbodies within the Town of Danvers are identified as Category 5 waters (impaired and requiring a TMDL), as described in Section 2.2.1. Currently, only one TMDL is established and final for Danvers. The *Final Pathogen TMDL for the North Coastal Watershed* (2012) includes the following waterbodies in Danvers: Crane Brook, Crane River, Danvers River, Frost Fish Brook, Porter River, and Waters River.

A *Draft Pathogen TMDL Report for the Ipswich River Watershed* has been completed but is not yet final and does not include any receiving waters in Danvers.

Section 3

Best Management Practices (BMPs) to Address Minimum Control Measures (MCMs)

This section includes descriptions of each BMP included in Danvers’ NOI, an implementation plan, guidelines and resources, and lists of important documentation to best address the MCMs in the General Permit.

3.1 MCM 1: Public Education and Outreach

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

This section of the SWMP describes how to comply with the Public Education and Outreach requirements in General Permit Section 2.3.2.

3.1.1 MCM 1 BMPs from NOI

BMP ID	BMP Media/Category	BMP Description	Targeted Audience	Responsible Department/Parties	Measurable Goal	Beginning Year of BMP Implementation
1A	Multi-media methods (including social media, website, and print materials)	Education and outreach on stormwater management topics of significance in Danvers (including proper pet waste management, proper use of pesticides and fertilizers). Educational topics will include but are not limited to those in Part 2.3.2.d.i	Residents	Public Works with support from Greenscapes	Distribute a minimum of two (2) educational messages spaced at least a year apart	2018 (PY1)
1B	Multi-media methods (including web and print materials)	Education and outreach on stormwater management topics of significance in Danvers (including proper lawn maintenance, parking lot sweeping). Educational topics will include but are not limited to those in Part 2.3.2.d.ii	Businesses, Institutions, and Commercial Facilities	Public Works with support from Greenscapes	Distribute a minimum of two (2) educational messages spaced at least a year apart	2019 (PY2)

BMP ID	BMP Media/ Category	BMP Description	Targeted Audience	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
1C	Multi-media methods (including web and print materials)	Education and outreach on stormwater management topics of significance in Danvers (including proper erosion and sedimentation control, permit requirements, and design standards). Educational topics will include but are not limited to those in Part 2.3.2.d.iii	Developers (Construction)	Public Works with support from Greenscapes	Distribute a minimum of two (2) educational messages spaced at least a year apart	2018 (PY1)
1D	Multi-media methods (including web and print materials)	Education and outreach on stormwater management topics of significance in Danvers (including pollution prevention, illicit discharges, information about the Multi-Sector General Permit). Educational topics will include but are not limited to those in Part 2.3.2.d.iv	Industrial Facilities	Public Works with support from Greenscapes	Distribute a minimum of two (2) educational messages spaced at least a year apart	2019 (PY2)

3.1.2 MCM 1 Implementation Plan

BMP 1A Education and Outreach to Residents

Education and outreach goals for BMP 1A include:

- Increasing awareness of the impact of human activities on stormwater runoff and water quality;
- Changing residential behavior over time; and
- Reaching broad audiences with information that appeals to a diverse public.

Danvers will provide educational materials and general outreach to residents for stormwater management topics relevant to the Town. Topics may include:

- information about Danvers’ impaired waterbodies;
- effects of outdoor activities such as lawn care on water quality (use of pesticides, herbicides, and fertilizers);
- benefits of appropriate on-site infiltration of stormwater;

- effects of automotive work and car washing on water quality;
- proper disposal of swimming pool water; and
- proper management of pet waste.

The Town will build upon the existing public education and outreach program to disseminate educational materials to residents via the internet, email, direct mailing, local cable channel, and/or public posting. The Town will coordinate public educational strategies with local watershed groups and take advantage of existing materials wherever possible. As a member community of the Greenscapes North Shore Coalition, Danvers has access to many educational materials for residents. See Appendix E for a list of the available materials. Section 3.1.5 includes free resources the Town can take advantage of to supplement the public education and outreach program.

BMP 1B Education and Outreach to Businesses, Institutions, and Commercial Facilities

Education and outreach goals for BMP 1B include:

- Increasing awareness of business practices that may contribute to stormwater pollution;
- Changing behavior over time; and
- Improving compliance with local code.

Danvers will provide educational materials and general outreach to businesses, institutions, and commercial facilities within Town for stormwater management topics relevant to Danvers. Topics may include:

- information about Danvers' impaired waterbodies;
- proper lawn maintenance (use of pesticides, herbicides and fertilizer);
- benefits of appropriate on-site infiltration of stormwater;
- building maintenance (use of detergents);
- minimizing the use of salt or other de-icing and anti-icing materials;
- proper storage of salt or other de-icing/anti-icing materials (cover/prevent runoff to storm system and contamination to groundwater);
- proper storage of materials (emphasize pollution prevention);
- proper management of waste materials and dumpsters (cover and pollution prevention);
- proper management of parking lot surfaces (sweeping);
- proper car care activities (washing of vehicles and maintenance); and
- proper disposal of swimming pool water by entities such as motels, hotels, and health and country clubs (discharges must be dechlorinated and otherwise free from pollutants).

The Town will build upon the existing public education and outreach program to disseminate educational materials to businesses, institutions, and commercial facilities within Town via the internet, email, direct mailing, local cable channel, and/or public

posting. The Town will coordinate public educational strategies with local watershed groups and take advantage of existing materials wherever possible. As a member community of the Greenscapes North Shore Coalition, Danvers has access to many educational materials for businesses, institutions, and commercial facilities. See Appendix E for a list of the available materials. Section 3.1.5 includes free resources the Town can take advantage of to supplement the public education and outreach program.

BMP 1C Education and Outreach to Developers

Education and outreach goals for BMP 1C include:

- Increasing awareness of the impact of construction activities on stormwater runoff and water quality;
- Changing developer behavior over time; and
- Improving compliance with local code.

Danvers will provide educational materials and general outreach to developers for stormwater management topics relevant to Danvers. Topics may include:

- information about Danvers' impaired waterbodies;
- 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).

The Town will build upon the existing public education and outreach program to disseminate educational materials to developers via the internet, email, direct mailing, local cable channel, and/or public posting. The Town will coordinate public educational strategies with local watershed groups and take advantage of existing materials wherever possible. As a member community of the Greenscapes North Shore Coalition, Danvers has access to many educational materials for developers. See Appendix E for a list of the available materials. Section 3.1.5 includes free resources the Town can take advantage of to supplement the public education and outreach program.

BMP 1D Education and Outreach to Industrial Facilities

Education and outreach goals for BMP 1D include:

- Increasing awareness of industrial activities that may contribute to stormwater pollution;
- Changing behavior over time; and
- Improving compliance with local code.

Danvers will provide educational materials and general outreach to industrial facilities within Town for stormwater management topics relevant to Danvers. Topics may include:

- information about Danvers' impaired waterbodies;
- equipment inspection and maintenance;
- proper storage of industrial materials (emphasize pollution prevention);

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

The Town will build upon the existing public education and outreach program to disseminate educational materials to industrial facilities within Town via the internet, email, direct mailing, local cable channel, and/or public posting. The Town will coordinate public educational strategies with local watershed groups and take advantage of existing materials wherever possible. As a member community of the Greenscapes North Shore Coalition, Danvers has access to many educational materials for industrial facilities. See Appendix E for a list of the available materials. Section 3.1.5 includes free resources the Town can take advantage of to supplement the public education and outreach program.

3.1.3 MCM 1 Implementation Schedule

Outreach Method	PY1	PY2	PY3	PY4	PY5
Social media					
Signage and brochures					
Targeted outreach					
Targeted outreach					
Targeted outreach					
Targeted outreach					

	Residents
	Businesses, Institutions, and Commercial Facilities
	Developers
	Industrial Facilities
	All Audiences

3.1.4 Public Education and Outreach Goals and Progress

Per Section 2.3.2.e of the General Permit, the public education and outreach program shall provide focused messages for specific audiences and show evidence that progress toward the goals of the program have been achieved. The Town will evaluate the effectiveness of the educational messages and overall education program by tracking changes in behavior for specific issues addressed with education throughout the permit term (e.g., visual inspections of the quantity of pet waste bags found in catch basins after targeted outreach and documenting the inspections with photographs).

The methods used to evaluate the effectiveness of the program shall be tied to the defined goals of the program and the overall objective of **changes in behavior and knowledge**.

3.1.5 MCM 1 Guidelines and Resources

The following links include free or low-cost resources Danvers can use to supplement the Public Education program.

EPA Public Education

<https://cfpub.epa.gov/npstbx/>

EPA Stormwater Education Toolkit (SET)

<http://www.stormwater.ucf.edu/toolkit/>

EPA National Menu of BMPs for Stormwater

<https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#edu>

MassDEP Public Education

<https://www.mass.gov/guides/stormwater-outreach-materials-to-help-towns-comply-with-the-ms4-permit>

Developing an Effective Stormwater Education and Outreach Program for Your Community

http://www.urbanwaterslearningnetwork.org/wp-content/uploads/2016/04/Manual-Stormwater-Education-and-Outreach_2014.pdf

Greenscapes

<http://greenscapes.org/services-resources/>

Greenscapes North Shore Coalition Public Education and Outreach materials

Available in Appendix E of this SWMP

Salem Sound Coastwatch

<http://www.salemsound.org/researchResources.html>

Northern Middlesex Stormwater Collaborative

<http://www.nmstormwater.org/resources-stormwater-collaborative>

Urban Waters

<http://www.nmstormwater.org/for-municipalities>

Merrimack Valley Stormwater Collaborative

<http://www.merrimackvalleystormwater.org/who-we-are/public-education/>

3.1.6 MCM 1 Checklist of Key Documentation

Documentation of BMP progress should be kept in Appendix F. The following checklist includes the required documentation for MCM 1. See Section 5 of this Plan for additional record keeping information.

- All educational materials provided to target audiences
- Distribution lists for target audiences
- Dates of distribution of educational materials

- Annually track changes in social media subscription and use
- Note educational goals and opinion on effectiveness based on results tracked; modify education and outreach program if necessary

3.2 MCM 2: Public Involvement and Participation

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

This section of the SWMP describes how to comply with the Public Involvement and Participation requirements in General Permit Section 2.3.3.

3.2.1 MCM 2 BMPs from NOI

BMP ID	BMP Category	BMP Description	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
2A	Public Review	SWMP review (Plan and reports available on web and at public meetings)	Public Works	Annually provide the public with an opportunity to participate in the review and implementation of the SWMP	2018 (PY1)
2B	Public Participation	Provide opportunities for public involvement and participation in Danvers' stormwater program (including clean up events). Specific activities, schedule, and lead departments are included in the SWMP.	Public Works	Ongoing compliance	2018 (PY1)
2C	Public Review	Continue Stormwater Advisory Committee (Public Works, Conservation Commission, Planning, Board of Health, Water/Sewer Commissioner or Superintendent)	Public Works	At a minimum, stormwater working group will meet annually.	2018 (PY1)

3.2.2 MCM 2 Implementation Plan

BMP 2A Stormwater Management Plan Public Review

Danvers shall provide the public with an opportunity to review this Stormwater Management Plan prior to finalizing it, and with other opportunities to participate in the Town's Stormwater Program on an annual basis.

While the Department of Public Works is the responsible party for this BMP, multiple Town Departments can help aid in successful implementation, as public participation in stormwater management initiatives often crosses Departments.

The NOI and SWMP were presented at a River Committee public meeting on September 20, 2018 to solicit input from the general public. Additionally, the draft NOI was posted online and available to the public for two weeks prior to the River Committee meeting. The Town will post the SWMP and NOI on the Town's website for the duration of the permit term.

BMP 2B Public Participation in Stormwater Management Program

Public involvement and participation goals for BMP 2B include:

- Increasing public involvement in and knowledge of Danvers' stormwater program; and
- Improving water quality through local clean up and waste collection events.

Danvers shall continue to provide notice for public meetings per Massachusetts General Law requirements, including meetings pertaining to the Stormwater Management Program.

The Town shall continue to provide annual opportunities for public participation in the Program. These opportunities may include, but are not limited to:

- Storm drain stenciling;
- Stormwater-related contents with school or Scout groups;
- Hazardous waste drop off day;
- Yard waste collection days; and/or
- Beach, stream, or street clean ups.

Appendix E includes a document with helpful tips for organizing and conducting volunteer clean-up events that Danvers may reference. The Town shall document all public participation activities in the Annual Reports, and documentation should seek to quantify results or impact to better evaluate the public involvement and participation program effectiveness.

BMP 2C Stormwater Advisory Committee

The Town has implemented a Stormwater Advisory Committee, which meets on an as-needed basis. The Committee will continue to meet annually and/or as needed during the Permit term.

3.2.3 MCM 2 Implementation Schedule

BMP	PY1	PY2	PY3	PY4	PY5
2A Stormwater Management Plan Public Review	●	●	●	●	●
2B Public Participation in Stormwater Management Program	←————→				
2C Stormwater Advisory Committee	●	●	●	●	●

● = annual requirement
 ←————→ = ongoing requirement

3.2.4 MCM 2 Guidelines and Resources

The following links include free or low-cost resources Danvers can use to supplement the Public Involvement program.

EPA National Menu of BMPs for Stormwater
<https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#inv>

EPA Evaluation of the Role of Public Outreach and Stakeholder Engagement in Stormwater Funding Decisions in New England: Lessons from Communities
<https://www.epa.gov/sites/production/files/2015-09/documents/eval-sw-funding-new-england.pdf>

Manchester Urban Ponds Restoration Program: Tips for Organizing and Conducting Volunteer Clean-up Events
 Available in Appendix E of this SWMP

Salem Sound Coastwatch Volunteer Webpage
<https://www.salemsound.org/volunteer.html>

Massachusetts Open Meeting Law Guide
<http://www.mass.gov/ago/docs/government/oml/oml-guide.pdf>

3.2.5 MCM 2 Checklist of Key Documentation

Documentation of BMP progress should be kept in Appendix F. The following checklist includes the required documentation for MCM 2. See Section 5 of this Plan for additional record keeping information.

- Public meeting dates and topics when stormwater management-related topic is discussed
- Dates of public participation activities and quantification of participation (such as number of volunteers/participants, number of bags collected, etc.)
- Meeting dates, topics, and attendees for Stormwater Advisory Committee meetings

3.3 MCM 3: Illicit Discharge Detection and Elimination Program

Objective: *The permittee shall implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges.*

This section of the SWMP describes how to comply with the Illicit Discharge Detection and Elimination Program requirements in General Permit Section 2.3.4.

3.3.1 MCM 3 BMPs from NOI

BMP ID	BMP Category	BMP Description	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
3A	IDDE Ordinance/Bylaw	Complete. Continue to enforce and update if necessary.	Public Works	Track illicit discharges identified and removed.	2018 (PY1)
3B	SSO Inventory	Develop SSO inventory in accordance of permit conditions	Public Works	Complete within one (1) year of effective date of permit. Track # of SSOs identified and removed annually	2018 (PY1)
3C	Storm sewer system map	Outfall Inventory Complete. Improve map during IDDE Program implementation	Public Works	Update map within two (2) years of effective date of permit and complete full system map 10 years after effective date of permit	2018 (PY1)
3D	Written IDDE program	Complete. Update written IDDE Plan as necessary	Public Works	Complete within one (1) year of the effective date of permit and update as required	2018 (PY1)
3E-1	Assessment and Priority Ranking of Outfalls & Interconnections	Outfall/ Interconnection Inventory and Initial Ranking as part of BMP 3D	Public Works	Complete within one (1) year of the effective date of permit and update as necessary	2018 (PY1)
3E-2	Assessment and Priority Ranking of Outfalls & Interconnections	Dry Weather Outfall Screening & Sampling in accordance with IDDE Plan and permit conditions	Public Works	Complete three (3) years after effective date of permit. Track # of illicit discharges identified & volume removed. Summarize screening/ sampling results.	2018 (PY1)

BMP ID	BMP Category	BMP Description	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
3E-3	Assessment and Priority Ranking of Outfalls & Interconnections	Catchment Investigations according to IDDE Program and permit conditions	Public Works	Complete 10 years after effective date of permit. Track # and percentage of MS4 catchments evaluated. Track # of illicit discharges identified & volume removed. Summarize screening/sampling results.	2019 (PY2)
3F	Employee Training	Train employees on IDDE implementation	Public Works	Train annually. Track employees trained, training topic, date/time, and materials presented.	2018 (PY1)

3.3.2 MCM 3 Implementation Plan

A written Illicit Discharge Detection and Elimination Plan was developed for the Town of Danvers, dated February 2018. Refer to this Plan for the complete IDDE program and requirements of MCM 3. This SWMP section presents a brief summary of the information presented in the IDDE Plan, and the information and guidance provided in the IDDE Plan supersedes.

BMP 3A IDDE Bylaw

The IDDE program shall include adequate legal authority to prohibit, investigate, and eliminate illicit discharges and implement enforcement procedures and actions. Danvers has met this requirement by adopting a bylaw entitled *Chapter XL: Regulate Illicit Discharges to the Municipal Storm Drain System* on May 16, 2011. This bylaw prohibits illicit discharges to the Town’s drainage system. The Department of Public Works serves as the enforcement agency for the bylaw.

BMP 3A is complete. See Section 4 of the IDDE Plan for additional information.

BMP 3B SSO Inventory

The Town must identify all known locations where sanitary sewer overflows (SSOs) have discharged to the municipal drainage system within the past five (5) years and create an inventory that includes the following information:

- Location, date, time, and volume of each occurrence;
- Whether the discharge entered surface water or the MS4;
- Description, indicating known or suspected cause(s); and
- Mitigation and corrective measures planned and completed.

This inventory must be kept up to date and appended to this SWMP. Each municipal Department can aid in the development and maintenance of the inventory by reporting instances of SSOs found during field work to the DPW.

BMP 3B is complete for Permit Year 1. See Section 2.1 of the IDDE Plan for additional information.

BMP 3C Storm Sewer System Map

A comprehensive map of Danvers' drainage system has been developed, and the Town has met a large portion of the requirements of this BMP. The total number of MS4 outfalls increased from 300 (as reported in Annual Reports) to 449 in the NOI due to a comprehensive review of historic drainage system mapping and outfall investigations completed in Fiscal Year 2018. Town staff should continue to update the map as necessary to reflect newly discovered information, corrections or modifications, improved connectivity, and progress made.

BMP 3C is ongoing. See Section 3 of the IDDE Plan for additional information.

BMP 3D Written IDDE Program

Danvers has implemented a town-wide IDDE Plan, finalized in February 2018, which includes procedures and timelines developed in accordance with the final General Permit. The Town should continue to update and modify the Plan on an as-needed basis.

BMP 3D is complete. See the IDDE Plan for additional information.

BMP 3E-1 Outfall/Interconnection Inventory and Initial Ranking

The Town has assessed and priority ranked each outfall within the MS4 in terms of their potential to have illicit discharges and SSOs, and the related public health significance.

BMP 3E-1 is complete. See Section 6 of the IDDE Plan for additional information.

BMP 3E-2 Dry Weather Outfall/Interconnection Screening and Sampling

Field investigations must be completed during dry weather conditions to confirm whether any Low or High Priority outfalls have dry weather flow, which may be indicative of illicit connections/discharges. The initial catchment delineation and priority ranking must be updated by the end of Permit Year 3 based on the data gathered in the field. All data gathered during implementation of this BMP must be reported annually.

BMP 3E-2 is ongoing. See Section 7.1 of the IDDE Plan for additional information.

BMP 3E-3 Outfall/Interconnection Catchment Investigations

Each catchment associated with an outfall or interconnection within the MS4 must be investigated based on identified System Vulnerability Factors (SVF, i.e., the likelihood that illicit discharges/connections exist) in that particular area. For all catchments, key junction manholes shall be opened and inspected for evidence of illicit connections during dry weather conditions. For catchments with one or more SVF, wet weather monitoring must be completed. The Town will identify the number of outfall catchments in the MS4 that have been evaluated using the catchment investigation procedure developed under BMP 3D. All data gathered during implementation of this BMP must be reported annually.

At the conclusion of field work for this BMP, the outfall/interconnection inventory should be updated and reprioritized for ongoing screening once every five years. See Sections 7.2 and 7.3 of the IDDE Plan for additional information.

BMP 3F Employee Training

Employees involved in the IDDE Program must be trained annually on the Program, including how to recognize illicit discharges and SSOs in accordance with the IDDE Plan.

See Section 9.2 of the IDDE Plan for additional information.

3.3.3 MCM 3 Implementation Schedule

EPA’s implementation timeline for the IDDE Program is available in Appendix E.

BMP	PY1	PY2	PY3	PY4	PY5
3A IDDE Bylaw	✓				
3B SSO Inventory	✓	●	●	●	●
3C Storm Sewer System Map	←→				
3D Written IDDE Program	✓				
3E-1 Outfall/Interconnection Inventory and Initial Ranking	✓				
3E-2 Dry Weather Screening and Sampling	←→				
3E-3 Catchment Investigations		←→			
3F Employee Training	●	●	●	●	●

- ✓ = BMP complete
- = annual requirement or year due
- ←→ = ongoing requirement

3.3.4 MCM 3 Guidelines and Resources

The following links include free or low-cost resources Danvers can use to supplement the IDDE program. The Town-specific procedures in the IDDE Plan were developed using the IDDE Guidance Manual and New England Source Tracking Protocol linked below.

**Center for Watershed Protection Illicit Discharge Detection and Elimination:
A Guidance Manual for Program Development and Technical Assessments**

https://www3.epa.gov/npdes/pubs/idde_manualwithappendices.pdf

EPA New England Bacterial Source Tracking Protocol

<https://www3.epa.gov/region1/npdes/stormwater/ma/2014AppendixI.pdf>

EPA National Menu of BMPs for Stormwater

<https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#ill>

**Danvers Regulate Illicit Discharges to the Municipal Storm Drain System
Bylaw**

<https://www.danversma.gov/documents/town-by-laws/>

3.3.5 MCM 3 Checklist of Key Documentation

Documentation of BMP progress should be kept in Appendix F. The following checklist includes the required documentation for MCM 3. More information about IDDE reporting is located in Section 10 of the IDDE Plan. See Section 5 of this Plan for additional record keeping information.

- Log of phone calls and complaints received regarding suspected illicit connections and other storm drain issues, including dates and actions taken;
- SSO inventory (updated annually), including the number of illicit discharges/connections identified and/or removed and the volume of sewage removed;
- Drainage system map;
- Data collected during dry and wet weather outfall/interconnection investigations, including the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening results, and results of all analyses (summarize on an annual basis and for the entire permit term);
- Number and percent of total outfall catchments served by the MS4 evaluated using the catchment investigation procedure;
- Presence or absence of System Vulnerability Factors for each catchment;
- Data collected during key junction manhole investigations;
- Inspection and maintenance records; and
- Frequency and type of employee training, including employees trained, training topic, date/time, and materials presented.

3.4 MCM 4: Construction Site Stormwater Runoff Control

Objective: *To minimize or eliminate erosion and maintain sediment on site so that it is not transported in stormwater and allowed to discharge to a water of the U.S. through the permittee’s MS4.*

This section of the SWMP describes how to comply with the Construction Site Stormwater Runoff Control requirements in General Permit Section 2.3.5.

3.4.1 MCM 4 BMPs from NOI

BMP ID	BMP Category	BMP Description	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
4A	Construction Bylaw and Regulations	Modify local bylaw and regulations, if necessary, to contain new MS4 provisions per section 2.3.5.	Planning Board	Review current procedures and modify if necessary within one (1) year of permit effective date	2018 (PY1)
4B	Construction Policy and Procedures	Develop and implement written procedures for site inspections and enforcement procedures per section 2.3.5.	Planning Board	Review current procedures and modify if necessary within one (1) year of permit effective date	2018 (PY1)

3.4.2 MCM 4 Implementation Plan

Per the General Permit, Danvers must develop and implement the following items, which will be adopted as either Bylaw/regulation modifications or a new policy or procedure:

- A regulatory mechanism that requires the use of sediment and erosion control practices at construction sites, as well as controls for other wastes on construction sites such as demolition debris, litter, and sanitary wastes;
- Written procedures for site inspections and enforcement of sediment and erosion control measures, including the responsible party for site inspections and enforcement authority, due within one (1) year of the effective date of the permit;
- 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;
- Requirements for construction site operators within the MS4 jurisdiction to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes; and
- Written procedures for site plan review and inspection and enforcement, due within one (1) year of the effective date of the permit.

BMP 4A Construction Bylaw and Regulations

The Town shall implement and enforce a program to reduce pollutants in stormwater runoff discharged to the municipal drainage system from construction activities, including use of sediment and erosion control practices, at sites greater than one acre. Danvers has met this requirement by adopting a bylaw entitled *Chapter XXXIX-A Stormwater Management and Land Disturbance* on May 16, 2011. This bylaw provides guidance for site planning and stormwater runoff control during construction and post-construction to protect local water resources from discharges. The Department of Public Works serves as the enforcement agency for the bylaw.

The Town will review the existing bylaw and regulations with respect to the 2016 General Permit and modify it if needed.

BMP 4B Construction Policy and Procedures

Danvers shall develop written procedures for site inspections and enforcement of sediment and erosion control measures. They will include procedures for tracking the number of site reviews, inspections, and enforcement actions.

3.4.3 MCM 4 Implementation Schedule

BMP	PY1	PY2	PY3	PY4	PY5
4A Construction Bylaw and Regulations	●				
4B Construction Policy and Procedures	●				

● = year due

3.4.4 MCM 4 Guidelines and Resources

The following links include free or low-cost resources Danvers can use to supplement the Construction program.

EPA Construction General Permit SWPPP template, including inspection forms

<https://www.epa.gov/npdes/epas-2017-construction-general-permit-cgp-and-related-documents>

Massachusetts Stormwater Handbook

<https://www.mass.gov/guides/massachusetts-stormwater-handbook-and-stormwater-standards>

EPA National Menu of BMPs for Stormwater

<https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#constr>

Danvers Stormwater Management and Land Disturbance Bylaw

<https://www.danversma.gov/documents/town-by-laws/>

Danvers Regulations Governing Stormwater Management

<https://www.danversma.gov/documents/stormwater-regulations-01-13-2012/>

Central Massachusetts Regional Stormwater Coalition SOP 5: Construction Site Inspection

http://www.centralmastormwater.org/Pages/crsc_toolbox/Construction%20Inspection%20SOP_FINAL.pdf

Central Massachusetts Regional Stormwater Coalition SOP 6: Erosion and Sedimentation Control

http://www.centralmastormwater.org/Pages/crsc_toolbox/Erosion%20and%20Sedimentation%20Control%20SOP_FINAL.pdf

3.4.5 MCM 4 Checklist of Key Documentation

Documentation of BMP progress should be kept in Appendix F. The following checklist includes the required documentation for MCM 4. See Section 5 of this Plan for additional record keeping information.

- Number of site reviews, inspections, and enforcement actions; and
- Modifications to Danvers' bylaws, regulations, policies, and/or procedures as necessary.

3.5 MCM 5: Post-Construction Stormwater Management

Objective: *Reduce the discharge of pollutants found in stormwater through the retention or treatment of stormwater after construction on new or redeveloped sites.*

This section of the SWMP describes how to comply with the Stormwater Management in New Development and Redevelopment requirements in General Permit Section 2.3.6.

3.5.1 MCM 5 BMPs from NOI

BMP ID	BMP Category	BMP Description	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
5A	Post-Construction Bylaw and Regulations	Modify local bylaw and regulations to contain new MS4 provisions per section 2.3.6.a.	Planning Board	Modify existing bylaw and/or regulations if necessary within two (2) years of permit effective date	2019 (PY2)
5B	Assess street 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.	Planning Board	Complete report no later than four (4) years of permit effective date	2020 (PY3)
5C	Assess allowing green infrastructure	Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist	Planning Board	Complete report no later than four (4) years of permit effective date	2020 (PY3)
5D	Retrofit Feasibility Assessment	Conduct detailed inventory of Town-owned properties and rank for retrofit potential	Planning Board	Complete report no later than four (4) years of permit effective date. Beginning in year 5 keep running list of at least five (5) retrofit sites	2020 (PY3)

3.5.2 MCM 5 Implementation Plan

BMP 5A Post-Construction Bylaw and Regulations

The Town shall implement and enforce a program to reduce pollutants in stormwater runoff discharged to the municipal drainage system from post-construction activities for all new development and redevelopment sites greater than one acre. Danvers has met this requirement by adopting a bylaw entitled *Chapter XXXIX-A Stormwater Management and Land Disturbance* on May 16, 2011. This bylaw provides guidance for site planning and stormwater runoff control during construction and post-construction to protect local water resources from discharges. The Department of Public Works serves as the enforcement agency for the bylaw.

The Town will need to review the existing bylaw and the *Regulations Governing Stormwater Management* with respect to the 2016 General Permit, specifically Section 2.3.6.a.2, and modify it if needed. For example, "design of treatment and infiltration practices should follow the guidance in Volume 2 of the Massachusetts Stormwater Handbook," which Danvers already requires in Section 6.A (Minimum Performance Standards) of the Regulations. However, there are several other enhanced standards for Low Impact Development, pollutant removal, runoff retention, and more that will need to be evaluated and incorporated into the Regulations. If MassDEP incorporated EPA's post-construction standards in the Massachusetts Stormwater Handbook, Danvers may be able to proceed with the current Bylaw and Regulations.

Additionally, the Town must have procedures in place to require the submission of as-built plans after the completion of construction projects and ensure long-term operation and maintenance of stormwater management practices in place at construction sites. The Town has already met these requirements through Sections 12 and 13 of the *Regulations Governing Stormwater Management*.

BMP 5B Assess Street and Parking Lot Guidelines

In accordance with General Permit Section 2.3.6.b, Danvers shall develop a report assessing current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover. This assessment shall be used to provide information to allow the Town to determine if changes to design standards for streets and parking lots can be made to support low impact design (LID) options. Input will be gathered from multiple Town departments, including the Planning Board. The final report will be appended to this SWMP once completed.

BMP 5C Assess Feasibility of Allowing Green Infrastructure

As detailed in General Permit Section 2.3.6.c, Danvers shall develop a report assessing local regulations to determine the feasibility of making green roofs, infiltration practices, and water harvesting devices allowable when appropriate site conditions exist. The Town shall implement all recommendations in accordance with the schedules contained in the assessment.

BMP 5D Retrofit Feasibility Assessment

The Town must identify at least five town-owned properties that could potentially be modified or retrofitted with BMPs designed to reduce the frequency, volume, and pollutant loads of stormwater discharges through a reduction of impervious area. General Permit Section 2.3.6.d describes factors and considerations for selecting potential sites with the

goal of reducing impervious area and improving water quality. The inventory must be updated annually starting in Permit Year 5.

3.5.3 MCM 5 Implementation Schedule

BMP	PY1	PY2	PY3	PY4	PY5
5A Post-Construction Bylaw and Regulations		●			
5B Assess Street and Parking Lot Guidelines				●	
5C Assess Feasibility of Allowing Green Infrastructure				●	
5D Retrofit Feasibility Assessment				●	→

● = year due

3.5.4 MCM 5 Guidelines and Resources

The following links include free or low-cost resources Danvers can use to supplement the Post-Construction program.

Massachusetts Stormwater Handbook
<https://www.mass.gov/guides/massachusetts-stormwater-handbook-and-stormwater-standards>

EPA National Menu of BMPs for Stormwater
<https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#post>

Danvers Stormwater Management and Land Disturbance Bylaw
<https://www.danversma.gov/documents/town-by-laws/>

Danvers Regulations Governing Stormwater Management
<https://www.danversma.gov/documents/stormwater-regulations-01-13-2012/>

Managing Stormwater in Your Community: A Guide for Building an Effective Post-Construction Program
<https://www3.epa.gov/npdes/pubs/stormwaterinthecommunity.pdf>

EPA Managing Stormwater with LID Practices: Addressing Barriers to LID
<https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/AddressingBarrier2LID.pdf>

Metropolitan Area Planning Council LID Toolkit
<https://www.mapc.org/resource-library/low-impact-development-toolkit/>

Central Massachusetts Regional Stormwater Coalition SOP 5: Construction Site Inspection
http://www.centralmastormwater.org/Pages/crsc_toolbox/Construction%20Inspection%20SOP_FINAL.pdf

Central Massachusetts Regional Stormwater Coalition SOP 6: Erosion and Sedimentation Control
http://www.centralmastormwater.org/Pages/crsc_toolbox/Erosion%20and%20Sedimentation%20Control%20SOP_FINAL.pdf

3.5.5 MCM 5 Checklist of Key Documentation

Documentation of BMP progress should be kept in Appendix F. The following checklist includes the required documentation for MCM 5. See Section 5 of this Plan for additional record keeping information.

- Measures the Town has taken to ensure adequate long-term operation and maintenance of stormwater BMPs and to require submission of as-built plans;
- Modifications to Danvers’ bylaws, regulations, policies, and/or procedures as necessary;
- Status of BMP 5B and 5C assessments, including any planned or completed changes to local regulations and guidelines (BMP 5B) and findings and progress towards making the practices allowable (BMP 5C); and
- Retrofit inventory, including all sites that have been modified or retrofitted. Sites should include town-owned sites identified in the inventory as well as non-municipal property modified or retrofitted to mitigate impervious area.

3.6 MCM 6: Good Housekeeping and Pollution Prevention

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

This section of the SWMP describes how to comply with the Good Housekeeping and Pollution Prevention requirements in General Permit Section 2.3.7.

3.6.1 MCM 6 BMPs from NOI

BMP ID	BMP Category	BMP Description	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
6A	Operation & Maintenance Program	Inventory and create O&M procedures for all permittee-owned parks and open spaces, buildings and facilities (including their storm drains), and vehicles and equipment	Public Works	Complete two (2) years after permit effective date, implement in following years	2019 (PY2)
6B	Operation & Maintenance Program	Establish and implement program for repair and rehabilitation of MS4 infrastructure	Public Works	Complete two (2) years after permit effective date, implement in following years	2019 (PY2)

BMP ID	BMP Category	BMP Description	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
6C	Stormwater Pollution Prevention Plans (SWPPP)	Develop and implement SWPPPs for the DPW facility and transfer station	Public Works	Complete SWPPPs within two (2) years of permit effective date, implement in following years	2019 (PY2)
6D-1	Operation & Maintenance Program	Implement procedures to optimize catch basin cleaning developed under BMP 6B	Public Works	Track frequency and material quantity of catch basin cleaning in town. In first Annual Report and in SWMP, document plan for optimizing catch basin cleaning.	2018 (PY1)
6D-2	Operation & Maintenance Program	Implement procedures for street and parking lot sweeping developed under BMP 6B	Public Works	Annually track number of miles cleaned or the volume or mass of material removed.	2018 (PY1)
6D-3	Operation & Maintenance Program	Implement procedures for use and storage of deicing materials developed under BMP 6B	Public Works	Implement program for winter road maintenance throughout permit term.	2018 (PY1)
6D-4	Operation & Maintenance Program	Implement procedures to inspect and maintain Town-owned structural stormwater BMPs	Public Works	Develop an inventory of Town-owned BMPs within two (2) years of permit effective date. Report on inspection and maintenance conducted annually.	2018 (PY1)

3.6.2 MCM 6 Implementation Plan

BMP 6A Operation and Maintenance Program for Municipal Facilities and Equipment

Danvers has developed a written Town-Wide Operation and Maintenance Program for municipal facilities and equipment, including:

- Parks and open space;
- Buildings and facilities, including schools, where pollutants are exposed to stormwater runoff; and
- Vehicles and equipment.

This plan includes an inventory of the municipally-owned facilities and equipment. Because this plan was developed several years ago, the Town should revisit the plan and inventory and make updates to meet the final General Permit Section 2.3.7.a and capture any changes to activities and responsible parties. This plan is available in the Engineering Department.

BMP 6B Operation and Maintenance Program for MS4 Infrastructure

The Town included MS4 Infrastructure Town-Wide Operation & Maintenance in the plan described in BMP 6A. This section of the plan describes the activities and procedures used to maintain MS4 infrastructure in a timely manner to reduce the discharge of pollutants from the MS4.

BMP 6C Stormwater Pollution Prevention Plans

The Town has prepared and is implementing a SWPPP for the Town's DPW facility. In accordance with General Permit Section 2.3.7.b, Danvers must also develop and implement a SWPPP for other Town-owned or operated waste handling facilities where pollutants are exposed to stormwater, such as the transfer station which is municipally owned but privately operated. SWPPP requirements include "regular" employee training for all members of the Pollution Prevention Team (at a minimum). Additionally, quarterly site inspections are required at these sites according to General Permit Section 2.3.7.b.iii.

BMP 6D-1 Catch Basin Cleaning

The Town must clean and inspect catch basins to make sure that catch basins are no more than 50% full. Develop and implement a program to optimize routine inspections, cleaning, and maintenance of catch basins. If a catch basin is consistently less than 50% full, the Town can reduce the frequency of cleanings. If a catch basin is more than 50% full during two consecutive cleanings/inspections, the Town must investigate the contributing drainage area for sources of excessive sediment loading and abate contributing sources when possible. Store and dispose/reuse catch basin cleanings according to MassDEP policies. The Town-Wide Operation and Maintenance Program plan referred to under BMPs 6A and 6B includes additional recommendations and guidance for this BMP.

BMP 6D-2 Street Sweeping

Establish and implement procedures for sweeping and/or cleaning streets and Town-owned parking lots. All streets must be swept and/or cleaned at least once per year in the spring (excluding rural streets with no curbs or catch basins). More frequent sweeping shall occur in targeted areas on the basis of pollutant load reduction potential. Store and dispose/reuse street sweepings according to MassDEP policies.

For rural streets with no curbs or catch basins, the Town must sweep at least once per year or develop a targeted inspection and sweeping plan for those streets.

The Town-Wide Operation and Maintenance Program plan referred to under BMPs 6A and 6B includes additional recommendations and guidance for this BMP.

BMP 6D-3 Deicing Materials

Establish and implement procedures for winter road maintenance, including the use and storage of salt and sand.

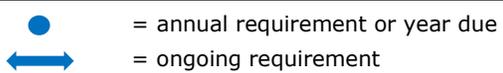
The Town-Wide Operation and Maintenance Program plan referred to under BMPs 6A and 6B includes additional recommendations and guidance in the *Sanding/Salting, Parking Lots and Road Maintenance* section.

BMP 6D-4 Inspection and Maintenance of Town-Owned BMPs

The Town shall develop inspection and maintenance procedures and frequencies for all stormwater treatment structures. An important first step will be to improve the inventory, mapping, and record keeping procedures for Town-owned or operated stormwater BMPs, such as detention ponds and swales. All Town-owned BMPs must be inspected annually at a minimum. The Town-Wide Operation and Maintenance Program plan referred to under BMPs 6A and 6B includes additional information about this BMP.

3.6.3 MCM 6 Implementation Schedule

BMP	PY1	PY2	PY3	PY4	PY5
6A O&M Program for Municipal Facilities and Equipment		●			
6B O&M Program for MS4 Infrastructure		●			
6C Stormwater Pollution Prevention Plans		●			
6D-1 Catch Basin Cleaning	←●	→	→	→	→
6D-2 Street Sweeping	←	●	→	→	→
6D-3 Deicing Materials	←	→	→	→	→
6D-4 Inspection and Maintenance of Town-Owned BMPs	●	●	●	●	●



 ● = annual requirement or year due
 ↔ = ongoing requirement

3.6.4 MCM 6 Guidelines and Resources

The following links include free or low-cost resources Danvers can use to supplement the Good Housekeeping and Pollution Prevention program. The Town should also refer to the Oil SPCC Plan and Town-Wide Operations and Maintenance Program (O&M) plan, located in the Engineering Department.

EPA National Menu of BMPs for Stormwater

<https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#poll>

Center for Watershed Protection Municipal Pollution Prevention/Good Housekeeping Practices

http://cdrpc.org/wp-content/uploads/2015/05/CWP_Municipal_Pollution_Prevention.pdf

MassDEP Management of Catch Basin Cleanings

<https://www.mass.gov/files/documents/2018/03/09/catch-basins.pdf>

MassDEP Reuse & Disposal of Street Sweepings

<https://www.mass.gov/files/documents/2018/05/14/street-sweepings.pdf>

MassDEP Snow Disposal Guidance

<https://www.mass.gov/guides/snow-disposal-guidance>

Central Massachusetts Regional Stormwater Coalition SOP: Inspecting Constructed BMPs

http://centralmastormwater.org/Pages/crsc_toolbox/Constructed%20BMP%20Inspection%20SOP_FINAL.pdf

3.6.5 MCM 6 Checklist of Key Documentation

Documentation of BMP progress should be kept in Appendix F. The following checklist includes the required documentation for MCM 6. See Section 5 of this Plan for additional record keeping information.

- Inventory of municipal facilities and equipment;
- Plan for optimizing catch basin cleaning and metrics about the number of catch basins, quantity cleaned and inspected, and total volume of material removed from all catch basins;
- Miles of streets cleaned and the volume of material removed; and
- All records associated with SWPPP quarterly site inspections, maintenance activities, and training.

Section 4

BMPs to Address Specific Waterbody Requirements

4.1 Impaired Waterbodies

As described in Section 2 of the SWMP, several surface waterbodies within Danvers were identified in the 2014 Integrated List of Waters as Category 5 waters needing a TMDL. Although Beaver Brook, Ipswich Brook, and Norris Brook are impaired for dissolved oxygen, no additional BMPs are required for these waterbodies. The 2016 General Permit does not require BMPs or outreach to be completed for dissolved oxygen impairments beyond the outfall/interconnection monitoring described in the IDDE Plan.

Additionally, while Norris Brook is impaired for total suspended solids (TSS) and turbidity, there are no mapped outfalls discharging to Norris Brook. The land in proximity to Norris Brook is forested or wetlands, with no development or roadways. Danvers should field verify that there are no outfalls discharging to Norris Brook. If this is confirmed, the Town of Danvers is not contributing to the TSS and turbidity impairments and does not need to complete any further BMPs as part of Appendix H of the 2016 General Permit.

4.2 North Coastal Watershed Pathogen TMDL

As described in Section 2.2.3 of the SWMP, a final TMDL for pathogens has been developed for the North Coastal Watershed. This TMDL requires that Towns discharging to the impaired waterways within the North Coastal Watershed comply with requirements in Appendix F of the General Permit. These requirements are summarized below as they apply to Danvers' program.

4.2.1 Enhanced BMPs

General Permit Part 2.3.3: Public Education and Outreach

Danvers shall supplement the residential public education program with an annual message about the proper management of pet waste. Educational materials should also be provided to dog owners during issuance or renewal of dog licenses. All pet waste management educational materials should:

- Reference the *Dog Leash Law* in the General Bylaws, which requires removal of any pet waste from public and private property;
- Describe the detrimental impacts of improper management of pet waste;
- Include requirements for waste collection and disposal; and
- List the penalties for non-compliance.

General Permit Part 2.3.4: Illicit Discharge Detection and Elimination Program

Catchments that drain to waterbodies impaired for bacteria or pathogens must be designated as "Problem" or "High Priority" catchments during implementation of the IDDE Program. This includes all outfalls discharging to the Waters River, Crane Brook, Crane River, Porter River, Danvers River, and Frost Fish Brook in Danvers.

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

According to Section 3.0 of the 2016 Small MS4 General Permit, MS4s that discharge to public surface drinking water supply sources or their tributaries should consider these waters a priority in the implementation of the SWMP. Putnamville Reservoir is the water supply for Salem and Beverly, as discussed in Section 2.1, and is therefore considered a Class A surface water. One outfall within Danvers' MS4 discharges to Putnamville Reservoir and should be considered a priority. This outfall is shown on the maps in Appendix A.

Additionally, Danvers should provide pretreatment and spill control measures to any stormwater discharges entering drinking water supply sources or their tributaries, and/or direct discharges should be avoided to the extent feasible.

Section 5 Program Evaluation, Record Keeping, and Reporting

5.1 Program Evaluation

The Town will annually self-evaluate its compliance with the terms and conditions of the 2016 General Permit, including the appropriateness of selected BMPs and progress toward defined measurable goals. The self-evaluation will be submitted as part of the Annual Report and maintained as part of the SWMP.

5.2 Record Keeping

The Town will keep all records required by the 2016 General Permit for **at least five years**, including, but not limited to the following key information:

- Monitoring results;
- Copies of reports;
- Records of outfall/interconnection screening;
- Follow-up and elimination of illicit discharges;
- Maintenance records; and
- Inspection records.

Checklists of record keeping items Danvers should maintain are also included under each BMP in Section 3 of the SWMP. Records relating to the 2016 General Permit, including the SWMP, will be made available to the public, as required by Section 4.2.c of the Permit.

5.3 Annual Reports

The Town will submit annual reports each year of the Small MS4 permit term, 90 days from the close of the reporting period (i.e., September 28). The reporting period will be a one-year period commencing on the permit effective date, and subsequent anniversaries thereof, except that the first annual report under the 2016 General Permit shall also cover the period from May 1, 2018 to the permit effective date, July 1, 2018. Under the 2016 General Permit, annual reports will consist of a simple update provided to EPA and more robust documentation included in Appendix F of this SWMP.

Per Section 4.4.b of the 2016 General Permit, the annual reports shall contain the following information:

- i. A self-assessment review of compliance with the permit terms and conditions.*
- ii. An assessment of the appropriateness of the selected BMPs.*
- iii. The status of any plans or activities required by part 2.1 and/ or part 2.2, including:*

- *Identification of all discharges determined to be causing or contributing to an exceedance of water quality standards and description of response including all items required by part 2.1.1;*
 - *For discharges subject to TMDL related requirements, identification of specific BMPs used to address the pollutant identified as the cause of impairment and assessment of the BMPs effectiveness at controlling the pollutant (part 2.2.1. and Appendix F) and any deliverables required by Appendix F;*
 - *For discharges to water quality limited waters a description of each BMP required by Appendix H and any deliverables required by Appendix H.*
- iv. *An assessment of the progress towards achieving the measurable goals and objectives of each control measure in part 2.3 including:*
- *Evaluation of the public education program including a description of the targeted messages for each audience; method of distribution and dates of distribution; methods used to evaluate the program; and any changes to the program.*
 - *Description of the activities used to promote public participation including documentation of compliance with state public notice regulations.*
 - *Description of the activities related to implementation of the IDDE program including: status of the map; status and results of the illicit discharge potential ranking and assessment; identification of problem catchments; status of all protocols described in part 2.3.4.(program responsibilities and systematic procedure); number and identifier of catchments evaluated; number and identifier of outfalls screened; number of illicit discharges located; number of illicit discharges removed; gallons of flow removed; identification of tracking indicators and measures of progress based on those indicators; and employee training.*
 - *Evaluation of the construction runoff management including number of project plans reviewed; number of inspections; and number of enforcement actions.*
 - *Evaluation of stormwater management for new development and redevelopment including status of ordinance development (2.3.6.a.ii.), review and status of the street design assessment (2.3.6.b.), assessments to barriers to green infrastructure (2.3.6.c), and retrofit inventory status (2.3.6.d.)*
 - *Status of the O&M Programs required by part 2.3.7.a.*
 - *Status of SWPPP required by part 2.3.7.b. including inspection results.*
 - *Any additional reporting requirements in part 3.0.*
- v. *All outfall screening and monitoring data collected by or on behalf of the permittee during the reporting period and cumulative for the permit term, including but not limited to all data collected pursuant to part 2.3.4. The permittee shall also provide a description of any additional monitoring data received by the permittee during the reporting period.*
- vi. *Description of activities for the next reporting cycle.*
- vii. *Description of any changes in identified BMPs or measurable goals.*
- viii. *Description of activities undertaken by any entity contracted for achieving any measurable goal or implementing any control measure.*

5.4 SWMP Modifications

Per Section 4.1 of the 2016 General Permit, the Town shall complete the following tasks:

- a. *The permittee shall annually self-evaluate its compliance with the terms and conditions of this permit and submit each self-evaluation in the Annual Report. The permittee shall also maintain the annual evaluation documentation as part of the SWMP.*
- b. *The permittee shall evaluate the appropriateness of the selected BMPs in achieving the objectives of each control measure and the defined measurable goals. Where a BMP is found to be ineffective the permittee shall change BMPs in accordance with the provisions below. In addition, permittees may augment or change BMPs at any time following the provisions below:*
 - *Changes adding (but not subtracting or replacing) components or controls may be made at any time.*
 - *Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP may be made as long as the basis for the changes is documented in the SWMP by, at a minimum:*
 - *An analysis of why the BMP is ineffective or infeasible;*
 - *Expectations on the effectiveness of the replacement BMP; and*
 - *An analysis of why the replacement BMP is expected to achieve the defined goals of the BMP to be replaced.*

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

- c. *EPA or MassDEP may require the permittee to add, modify, repair, replace or change BMPs or other measures described in the annual reports as needed:*
 - *To address impacts to receiving water quality caused or contributed to by discharges from the MS4; or*
 - *To satisfy conditions of this permit*

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

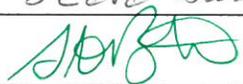
The Town may update or revise the SWMP as needed as the Town's activities are modified, changed, or updated to meet permit conditions during the permit term. If it is necessary to modify or update the SWMP, the Town should follow this procedure to formalize the changes:

- Keep a log with a description of the modification, the date, and the name and signature of the person making it; and
- Re-sign and date the certification statement in Section 6 of this SWMP.

A SWMP amendment log and additional certification statements are located in Appendix G.

Section 6 SWMP Certification

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

Name: Steve Bartha Title: Town Manager
Signature:  Date: 3/19/2019

Appendix A

Notice of Intent
and
Authorization to Discharge Letter from EPA

Part I: General Conditions

General Information

Name of Municipality or Organization: State:

EPA NPDES Permit Number (if applicable):

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:

Other Information

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

Eligibility Determination

Endangered Species Act (ESA) Determination Complete? Eligibility Criteria (check all that apply): A B C

National Historic Preservation Act (NHPA) Determination Complete? 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? If 100% of 2003 requirements not met, enter an estimated date of completion (MM/DD/YY):

Web address where MS4 map is published:

If outfall map is unavailable on the internet an electronic or paper copy of the outfall map must be included with NOI submission (see section V for submission options)

Regulatory Authorities (if covered under the 2003 permit)

Illicit Discharge Detection and Elimination (IDDE) Authority Adopted? <i>(Part II, III, IV or V, Subpart B.3.(b.) of 2003 permit)</i>	<input type="text" value="Yes"/>	Effective Date or Estimated Date of Adoption (MM/DD/YY):	<input type="text" value="05/16/11"/>
Construction/Erosion and Sediment Control (ESC) Authority Adopted? <i>(Part II,III,IV or V, Subpart B.4.(a.) of 2003 permit)</i>	<input type="text" value="Yes"/>	Effective Date or Estimated Date of Adoption (MM/DD/YY):	<input type="text" value="05/16/11"/>
Post- Construction Stormwater Management Adopted? <i>(Part II, III, IV or V, Subpart B.5.(a.) of 2003 permit)</i>	<input type="text" value="Yes"/>	Effective Date or Estimated Date of Adoption (MM/DD/YY):	<input type="text" value="05/16/11"/>

Waterbody that receives flow from the MS4 and segment ID if applicable	Number of outfalls into receiving water segment	Chloride	Chlorophyll-a	Dissolved Oxygen/DO Saturation	Nitrogen	Oil & Grease/ PAH	Phosphorus	Solids/ TSS/ Turbidity	E. coli	Enterococcus	Other pollutant(s) causing impairments
Nichols Brook MA92-25	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"/>	
Porter River MA93-04	34	<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"/>	
Wetland/Tributary to Porter River MA93-04	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"/>	
Wetland/Tributary to Putnamville 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"/>	
Waters River MA93-01	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"/>	
Wetland/Tributary to Waters River MA93-01	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"/>	
Interconnection with Peabody	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"/>	
Outside Receiving	191	<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"/>	
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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 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 require a target audience).

MCM 1: Public Education and Outreach

BMP ID	BMP Media/Category	BMP Description	Targeted Audience	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
1A	Multi-media methods (including social media, website, and print materials)	Education and outreach on stormwater management topics of significance in Danvers (including proper pet waste management, proper use of pesticides and fertilizers). Educational topics will include but are not limited to those in Part 2.3.2.d.i	Residents	Public Works with support from Greenscapes	Distribute a minimum of two (2) educational messages spaced at least a year apart	2018 (PY1)
1B	Multi-media methods (including web and print materials)	Education and outreach on stormwater management topics of significance in Danvers (including proper lawn maintenance, parking lot sweeping). Educational topics will include but are not limited to those in Part 2.3.2.d.ii	Businesses, Institutions, and Commercial Facilities	Public Works with support from Greenscapes	Distribute a minimum of two (2) educational messages spaced at least a year apart	2019 (PY2)

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

BMP ID	BMP Media/Category	BMP Description	Targeted Audience	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
1C	Multi-media methods (including web and print materials)	Education and outreach on stormwater management topics of significance in Danvers (including proper erosion and sedimentation control, permit requirements, and design standards). Educational topics will include but are not limited to those in Part 2.3.2.d.iii	Developers (Construction)	Public Works with support from Greenscapes	Distribute a minimum of two (2) educational messages spaced at least a year apart	2018 (PY1)
1D	Multi-media methods (including web and print materials)	Education and outreach on stormwater management topics of significance in Danvers (including pollution prevention, illicit discharges, information about the Multi-Sector General Permit). Educational topics will include but are not limited to those in Part 2.3.2.d.iv	Industrial Facilities	Public Works with support from Greenscapes	Distribute a minimum of two (2) educational messages spaced at least a year apart	2019 (PY2)

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

Part III: Stormwater Management Program Summary

MCM 2: Public Involvement and Participation

BMP ID	BMP Category	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of BMP Implementation
2A	Public Review	SWMP review (Plan and reports available on web and at public meetings)	Public Works	Annually provide the public with an opportunity to participate in the review and implementation of the SWMP	2018 (PY1)
2B	Public Participation	Provide opportunities for public involvement and participation in Danvers' stormwater program (including clean up events). Specific activities, schedule, and lead departments are included in the SWMP.	Public Works	Ongoing compliance	2018 (PY1)
2C	Public Review	Continue Stormwater Advisory Committee (Public Works, Conservation Commission, Planning, Board of Health, Water/Sewer Commissioner or Superintendent)	Public Works	At a minimum, stormwater working group will meet annually.	2018 (PY1)

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

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

Part III: Stormwater Management Program Summary

MCM 3: Illicit Discharge Detection and Elimination (IDDE)

BMP ID	BMP Category	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of BMP Implementation
3A	IDDE Ordinance/Bylaw	Complete. Continue to enforce and update if necessary.	Public Works	Track illicit discharges identified and removed.	2018 (PY1)
3B	SSO Inventory	Develop SSO inventory in accordance of permit conditions	Public Works	Complete within one (1) year of effective date of permit. Track # of SSOs identified and removed annually	2018 (PY1)
3C	Storm sewer system map	Outfall Inventory Complete. Improve map during IDDE Program implementation	Public Works	Update map within two (2) years of effective date of permit and complete full system map 10 years after effective date of permit	2018 (PY1)
3D	Written IDDE program	Complete. Update written IDDE Plan as necessary	Public Works	Complete within one (1) year of the effective date of permit and update as required	2018 (PY1)
3E-1	Assessment and Priority Ranking of Outfalls & Interconnections	Outfall/ Interconnection Inventory and Initial Ranking as part of BMP 3D	Public Works	Complete within one (1) year of the effective date of permit and update as necessary	2018 (PY1)
3E-2	Assessment and Priority Ranking of Outfalls & Interconnections	Dry Weather Outfall Screening & Sampling in accordance with IDDE Plan and permit conditions	Public Works	Complete three (3) years after effective date of permit. Track # of illicit discharges identified & volume removed. Summarize screening/ sampling results.	2018 (PY1)

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BMP ID	BMP Category	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of BMP Implementation
3E-3	Assessment and Priority Ranking of Outfalls & Interconnections	Catchment Investigations according to IDDE Program and permit conditions	Public Works	Complete 10 years after effective date of permit. Track # and percentage of MS4 catchments evaluated. Track # of illicit discharges identified & volume removed. Summarize screening/sampling results.	2019 (PY2)
3F	Employee Training	Train employees on IDDE implementation	Public Works	Train annually. Track employees trained, training topic, date/time, and materials presented.	2018 (PY1)

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

Part III: Stormwater Management Program Summary

MCM 4: Construction Site Stormwater Runoff Control

BMP ID	BMP Category	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of BMP Implementation
4A	Construction Bylaw and Regulations	Modify local bylaw and regulations, if necessary, to contain new MS4 provisions per section 2.3.5.	Planning Board	Review current procedures and modify if necessary within one (1) year of permit effective date	2018 (PY1)
4B	Construction Policy and Procedures	Develop and implement written procedures for site inspections and enforcement procedures per section 2.3.5.	Planning Board	Review current procedures and modify if necessary within one (1) year of permit effective date	2018 (PY1)

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

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

Part III: Stormwater Management Program Summary

MCM 5: Post-Construction Stormwater Management in New Development and Redevelopment

BMP ID	BMP Category	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of BMP Implementation
5A	Post-Construction Bylaw and Regulations	Modify local bylaw and regulations to contain new MS4 provisions per section 2.3.6.a.	Planning Board	Modify existing bylaw and/or regulations if necessary within two (2) years of permit effective date	2019 (PY2)
5B	Assess street 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.	Planning Board	Complete report no later than four (4) years of permit effective date	2020 (PY3)
5C	Assess allowing green infrastructure	Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist	Planning Board	Complete report no later than four (4) years of permit effective date	2020 (PY3)

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

BMP ID	BMP Category	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of BMP Implementation
5D	Retrofit Feasibility Assessment	Conduct detailed inventory of Town-owned properties and rank for retrofit potential	Planning Board	Complete report no later than four (4) years of permit effective date. Beginning in year 5 keep running list of at least five (5) retrofit sites	2020 (PY3)

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

Part III: Stormwater Management Program Summary

MCM 6: Municipal Good Housekeeping and Pollution Prevention

BMP ID	BMP Category	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of BMP Implementation
6A	Operation & Maintenance Program	Inventory and create O&M procedures for all permittee-owned parks and open spaces, buildings and facilities (including their storm drains), and vehicles and equipment	Public Works	Complete two (2) years after permit effective date, implement in following years	2019 (PY2)
6B	Operation & Maintenance Program	Establish and implement program for repair and rehabilitation of MS4 infrastructure	Public Works	Complete two (2) years after permit effective date, implement in following years	2019 (PY2)
6C	Stormwater Pollution Prevention Plans (SWPPP)	Develop and implement SWPPPs for the DPW facility and transfer station	Public Works	Complete SWPPPs within two (2) years of permit effective date, implement in following years	2019 (PY2)
6D-1	Operation & Maintenance Program	Implement procedures to optimize catch basin cleaning developed under BMP 6B	Public Works	Track frequency and material quantity of catch basin cleaning in town. In first Annual Report and in SWMP, document plan for optimizing catch basin cleaning.	2018 (PY1)

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

BMP ID	BMP Category	BMP Description	Responsible Department/Parties	Measurable Goal	Beginning Year of BMP Implementation
6D-2	Operation & Maintenance Program	Implement procedures for street and parking lot sweeping developed under BMP 6B	Public Works	Annually track number of miles cleaned or the volume or mass of material removed.	2018 (PY1)
6D-3	Operation & Maintenance Program	Implement procedures for use and storage of deicing materials developed under BMP 6B	Public Works	Implement program for winter road maintenance throughout permit term.	2018 (PY1)
6D-4	Operation & Maintenance Program	Implement procedures to inspect and maintain Town-owned structural stormwater BMPs	Public Works	Develop an inventory of Town-owned BMPs within two (2) years of permit effective date. Report on inspection and maintenance conducted annually.	2018 (PY1)

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.

1. BMPs identified in the 2003 General Permit NOI have evolved over the permit term due to staff changes and Stormwater Program modifications. The intent of the 2003 BMPs are being met under the proposed 2016 General Permit BMPs included in the Stormwater Management Plan. The Plan describes how the BMPs under the 2003 permit fit into the new program, particularly where BMPs and/or measurable goals that are outdated or no longer appropriate have been replaced or updated.
2. The National Endangered Species Eligibility Determination screening process has been completed and the Town of Danvers meets Criterion C. The Town's stormwater discharges and discharge related activities will have no affect on listed species or critical habitat. The Town will consult with U.S. Fish and Wildlife as needed during the permit term.
3. The National Historic Preservation Act Eligibility Determination screening process has been completed and the Town of Danvers meets Criterion A. The Town's stormwater discharges do not have the potential to cause effects on historic properties. The Town will consult with the State Historic Preservation Officer as needed during the permit term.
4. The total number of MS4 outfalls increased from 300 (reported in Annual Reports) to 449 in the NOI due to a comprehensive review of historic drainage system mapping and outfall investigations in Fiscal Year 2018. This is further explained in the SWMP and IDDE Plan. The outfalls and associated receiving waters in Part II are based on mapping as of September 2018 and are subject to change during implementation of the Stormwater Management Program as newly constructed outfalls are added to the map and inventory; locations are adjusted; or outfalls are removed if they are determined to be non-municipally owned/operated or reclassified as a BMP inlet, culvert, or other structure. Changes to the outfall inventory and mapping will be formalized in Annual Reports to EPA.

Detailed explanations of the above notes are included in the Town's Stormwater Management Plan.

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:

Steve Bartha

Title:

Town Manager

Signature:

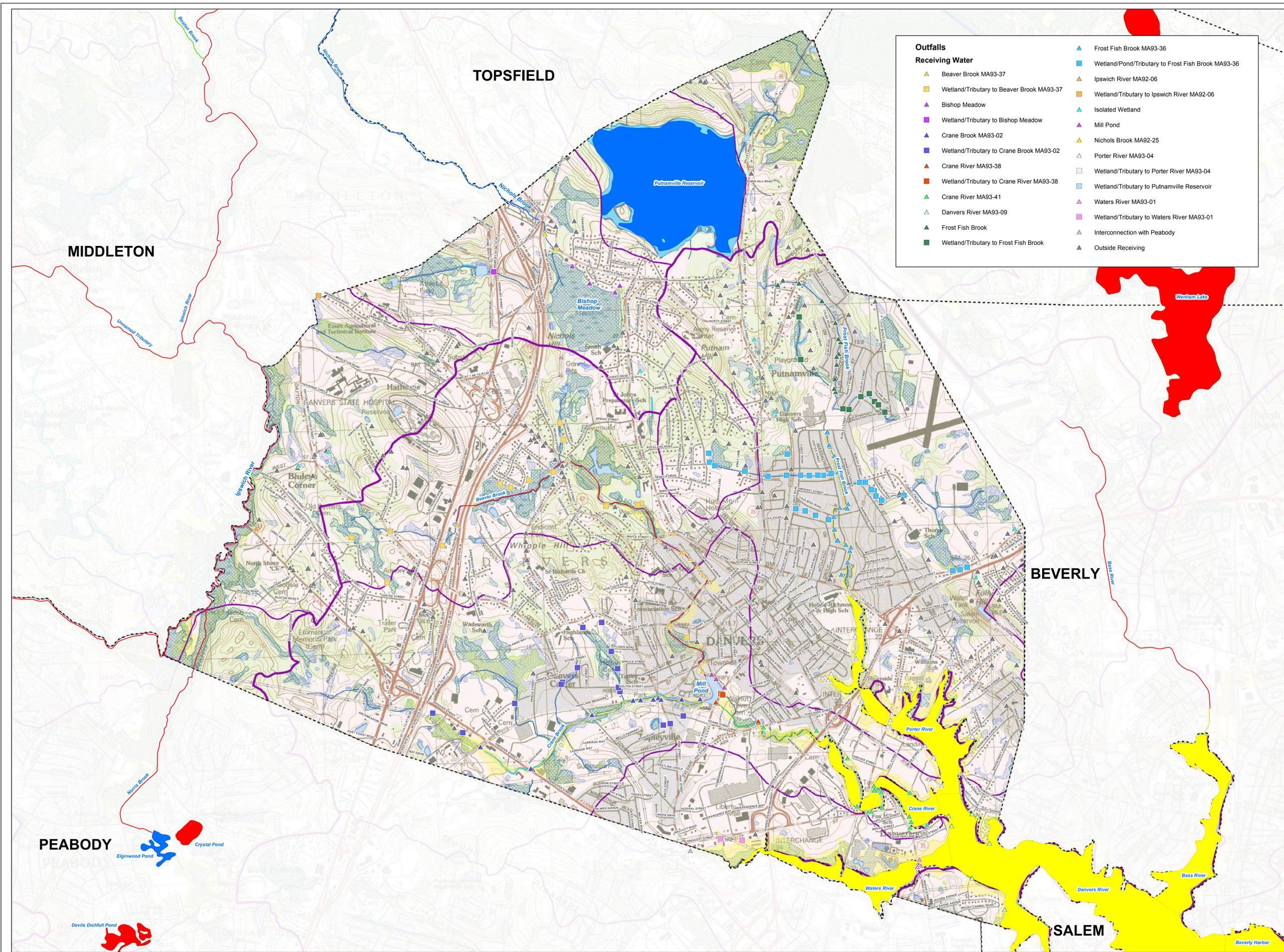


Date:

9/27/2018

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

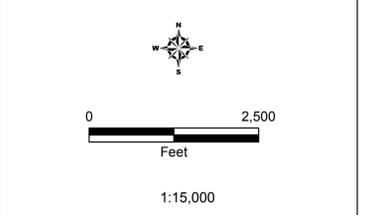
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Outfalls	
▲ Beaver Brook MA93-37	▲ Frost Fish Brook MA93-36
■ Wetland/Tributary to Beaver Brook MA93-37	■ Wetland/Pond/Tributary to Frost Fish Brook MA93-36
▲ Bishop Meadow	▲ Ipswich River MA92-06
■ Wetland/Tributary to Bishop Meadow	■ Wetland/Tributary to Ipswich River MA92-06
▲ Crane Brook MA93-02	▲ Isolated Wetland
■ Wetland/Tributary to Crane Brook MA93-02	▲ Mill Pond
▲ Crane River MA93-38	▲ Nichols Brook MA92-25
■ Wetland/Tributary to Crane River MA93-38	▲ Porter River MA93-04
▲ Crane River MA93-41	■ Wetland/Tributary to Porter River MA93-04
▲ Danvers River MA93-09	■ Wetland/Tributary to Putnamville Reservoir
▲ Frost Fish Brook	▲ Waters River MA93-01
■ Wetland/Tributary to Frost Fish Brook	■ Wetland/Tributary to Waters River MA93-01
	▲ Interconnection with Peabody
	▲ Outside Receiving

Outfalls and Receiving Waterbodies

LEGEND	
■ Major Drainage Basin	Water Body Segments - Rivers
■ Subbasin	Category
■ Urban Area 2000	■ 2 - Attaining some uses, other uses not assessed
■ Urban Area 2010 Census	■ 3 - No uses assessed
■ MassDEP Waterbodies	■ 4A - Impaired - TMDL is completed
■ Public Surface Water Supply (PSWS)	■ 4C - Impairment not caused by a pollutant
■ Water Bodies	■ 5 - Impaired - TMDL required
■ MassDEP Inland Wetlands	
■ MassDEP Coastal Wetlands	Water Body Segments - Lakes, Estuaries
■ Stream/Intermittent Stream	Category
National Wetlands	■ 2 - Attaining some uses, other uses not assessed
Inventories Wetland Areas	■ 3 - No uses assessed
■ Freshwater Emergent Wetland	■ 4A - Impaired - TMDL is completed
■ Freshwater Forested/Shrub Wetland	■ 4C - Impairment not caused by a pollutant
■ Freshwater Pond	■ 5 - Impaired - TMDL required
■ Lake	
■ Riverine	
■ NWI Rivers and Streams	
Flood Zone Designations	
■ 100 Year Flood Zone	
■ Town Boundary	



NOTES

1. Based on USGS Topo Map (1985 and 1987)
2. MassGIS: 2014 Integrated List Data (2016), Major Drainage Basins (2003), Subbasins (2007), Community Boundary (2017), National Wetlands Inventory (2007), FEMA National Flood Hazard (2017), MassDOT Major Roads (2014)
3. Town of Danvers: Outfalls

Notice of Intent
Danvers, Massachusetts

September 2018

Tighe & Bond
Engineers | Environmental Specialists

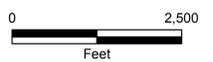


STORMWATER INFRASTRUCTURE

LEGEND

- Outfalls
 - Catch Basin
 - Inlet
 - Drain Manhole
 - Culvert
 - Drain Pipes
 - Detention Basin
 - Major Drainage Basin
 - Subbasin
 - Urban Area 2000
 - Urban Area 2010 Census
 - Public Surface Water Supply (PSWS)
 - Water Bodies
 - MassDEP Inland Wetlands
 - MassDEP Coastal Wetlands
 - Stream/Intermittent Stream
- National Wetlands Inventory Wetland Areas**
 - Freshwater Emergent Wetland
 - Freshwater Forested/Shrub Wetland
 - Freshwater Pond
 - Lake
 - Riverine
 - NWI Rivers and Streams
 - Parcel
 - Town Boundary

LOCUS MAP



1:15,000

NOTES

1. MassGIS: Major Drainage Basins (2003), Subbasins (2007), Community Boundary (2017), National Wetlands Inventory (2007), FEMA National Flood Hazard (2017), MassDOT Major Roads (2014)
3. Town of Danvers: Stormwater Infrastructure

Notice of Intent
Danvers, Massachusetts

September 2018



Appendix B

Summary of 2003 and 2016 MS4 General Permit BMPs

Appendix B

Summary of 2003 and 2016 MS4 General Permit BMPs

BMPs identified in the 2003 General Permit NOI have evolved over the permit term due to staff changes and Stormwater Program modifications. The intent of the 2003 BMPs are being met under the following proposed 2016 General Permit BMPs (BMPs current as of 2018 Annual Report):

MCM 1: Public Education and Outreach

- 1-1 - Article about SWMP in the "What's in the Works" Newsletter - now under BMPs 1A and 1E
- 1-2 - Continue to educate dog owners about picking up waste - now under BMPs 1A and 1E
- 1-3 - Develop and offer education program to schools - now under BMPs 1B and 1E
- 1-4 - Annual update of SWMP at a Selectmen's meeting - now under BMPs 2A and 2B
- 1-5 - Distribute educational materials - now under BMP 1 (A-E)
- 1-6 - Distribute "Greenscapes" educational materials - now under BMP 1 (A-E)
- 1-7 - Sell rain barrels and compost bins - now under BMP 2B
- 1-8 - Create and distribute a direct mail piece - now under BMPs 1A and 1E
- 1-9 - Pet Waste News Splash - now under BMP 1 (A-E)
- 1-10 - Carry In/Carry Out Policy - now under BMP 1A

MCM 2: Public Involvement and Participation

- 2-1 - Form Stormwater Advisory Committee - now under BMP 2C
- 2-2 - Comply with State public notification guidelines - now under BMPs 1 (A-E) and 2B
- 2-3 - Provide stenciling materials - now under BMP 2B
- 2-4 - Calendar Contest - now under BMP 2B
- 2-5 - Community Service Bulletin - now under BMP 2B
- 2-6 - Sandy Beach clean up - now under BMP 2B

MCM 3: Illicit Discharge Detection and Elimination

- 3-1 - Continue to conduct dry weather outfall screening - now under BMP 3E.2
- 3-2 - Update mapping of stormwater outfalls - now under BMP 3C
- 3-3 - Develop and implement plan to identify and remove illicit discharge - now under BMP 3D
- 3-4 - Continue to enforce inspection of sewer connection bylaw - now under BMP 3A
- 3-5 - Implement employee educational program - now under BMP 3F

MCM 4: Construction Site Stormwater Runoff Control

- 4-1 - ESC bylaw for construction sites > 1 acre - now under BMP 4A
- 4-2 - Require waste management plan - now under BMP 3D
- 4-3 - Review site plans for stormwater impacts - now under BMP 4B
- 4-4 - Provide public input for sites > 1 acre - now under BMP 2B
- 4-5 - Inspection of erosion and sediment controls - now under BMP 4B

MCM 5: Post Construction Stormwater Management in New Development and Redevelopment

- 5-1 - Develop bylaw to apply MA SW Policy to entire Town - now under BMPs 4A and 5A
- 5-2 - Specify SW BMP manual - now under BMPs 4A and 4B
- 5-3 - Develop bylaw for maintenance of BMPs - now under BMP 5A

Appendix B

Summary of 2003 and 2016 MS4 General Permit BMPs

MCM 6: Pollution Prevention and Good Housekeeping in Municipal Operations

- 6-1 - Update sensitive receptor inventory - now under BMP 3D
- 6-2 - Street Sweeping - now under BMPs 6A and 6D.2
- 6-3 - Roadway deicing - now under BMPs 6A and 6D.3
- 6-4 - Minimize impacts from vehicle washing - now under BMP 6A
- 6-5 - Minimize vehicle maintenance - now under BMP 6A
- 6-6 - Storm drain maintenance - now under BMPs 6B, 6D.1, and 6D.4
- 6-7 - Park and landscape maintenance - now under BMP 6A
- 6-8 - Stormwater Infrastructure Clean-up - now under BMPs 6B, 6D.1, and 6D.4
- 6-9 - Good Housekeeping and Pollution Prevention Program - now under BMP 6 (A-D)

Appendix C

Endangered Species Act Eligibility Criteria Documentation

Endangered Species Act Eligibility Certification

TO: Town of Danvers Stormwater Management Program Files
FROM: Tighe & Bond
COPY: Stephen King, P.E., Town Engineer
DATE: February 27, 2019

Tighe & Bond has completed the Endangered Species Eligibility Determination screening process in accordance with Part 1.9.1 and Appendix C of U.S. EPA's National Pollutant Discharge Elimination System (NPDES) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) in Massachusetts (see Attachment A of this memorandum), effective July 1, 2018, and determined that the **Town of Danvers** meets **Criterion B**, where informal consultation with U.S. Fish and Wildlife Service (USFWS) resulted in a finding that the stormwater discharges and discharge related activities are "not likely to adversely affect" listed species or critical habitat.

Tighe & Bond followed EPA's screening process required by the 2016 Small MS4 General Permit as follows:

Tighe & Bond went to the USFWS Information for Planning and Consultation (IPaC) website¹ and requested an Official Species List from the USFWS New England Ecological Services Field Office, included in Attachment B to this memorandum. The Official Species List for Danvers lists the following species that may occur or could potentially be affected by activities in the Town:

- Northern Long-eared Bat, and
- Roseate Tern.

The Official Species List documents that there are **no critical habitats in Danvers**.

Tighe & Bond then went to the USFWS New England Field Office website for Endangered Species Reviews/Consultations² and selected the Massachusetts state list³ to review which Towns have federally-listed species. A copy of the list of Federally Listed Endangered and Threatened Species in Massachusetts is included in Attachment C to this memorandum. Based on review of this list, the Northern Long-eared Bat is listed statewide and the Roseate Tern is not listed in Essex county.

Tighe & Bond then reviewed Step 1 Part B of the USFWS endangered species consultation, and visited the Massachusetts Natural Heritage and Endangered Species Program (NHESP) species information and conservation website about the Northern Long-eared Bat⁴ and Roseate Tern⁵. The NHESP fact sheets for the Northern Long-eared Bat and Roseate Tern are included in Attachment D to this memorandum.

¹ <http://ecos.fws.gov/ipac/>

² https://www.fws.gov/newengland/EndangeredSpec-Consultation_Project_Review.htm

³ <https://www.fws.gov/newengland/pdfs/MA%20species%20by%20town.pdf>

⁴ <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/species-information-and-conservation/rare-mammals/northern-long-eared-bat.html>

⁵ <http://www.mass.gov/eea/docs/dfg/nhosp/species-and-conservation/nhfacts/roseate-tern.pdf>

The NHESP website included a map showing the known locations of the Northern Long-eared Bat within Massachusetts. Attachment D includes a map showing there are **no roost trees or hibernating locations within Danvers.**

The NHESP fact sheet for the Roseate Tern includes a map that shows the current and historic Roseate Tern nesting colonies. There are **no nesting colonies in the vicinity of Danvers.**

Based on the results of the USFWS and NHESP website review, Tighe & Bond determined that the Town's action area is "not likely to adversely affect" listed species or critical habitat.

Attachment E provides the results of Tighe & Bond's informal consultation on behalf of the Town of Danvers with a letter from USFWS, which states that stormwater discharge activities associated with the 2016 NPDES MA MS4 General Permit "may affect, but are not likely to adversely affect" species in the project area.

Step 1 – Determine if you can meet USFWS Criterion A

"USFWS Criterion A: You can certify eligibility, according to USFWS Criterion A, for coverage by this permit if, upon completing the Information, Planning, and Conservation (IPaC) online system process, you printed and saved the preliminary determination which indicated that federally listed species or designated critical habitats are not present in the action area. See Attachment 1 to Appendix C for instructions on how to use IPaC."

No, the Town of Danvers's IPaC action area contains the Northern Long-eared Bat and Roseate Tern.

Step 2 – Determine if You Can Meet Eligibility USFWS Criteria B

"USFWS Criterion B: You can certify eligibility according to USFWS Criteria B for coverage by this permit if you answer "Yes" to **all** of the following questions:

- 1) Does your action area contain one or more of the following species: Sandplain gerardia, Small whorled Pogonia, American burying beetle, Dwarf wedgemussel, Northeastern bulrush, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Roseate Tern, Puritan tiger beetle, and Northeastern beach tiger beetle?"

Yes, the Official Species List indicated that the Town of Danvers's action area may contain the Roseate Tern.

- 2) Did your assessment of the discharge and discharge related activities indicate that the discharge or discharge related activities "may affect" or are "not likely to adversely affect" listed species or critical habitat?

Yes, based on EPA guidance and review of USFWS and NHESP documentation, Tighe & Bond has determined that the Town's discharges and discharge related activities are "not likely to adversely affect" listed species or critical habitat (see discussion above).

- 3) Did you contact the USFWS and did the formal or informal consultation result in either a “no jeopardy” opinion by the USFWS (for formal consultation) or concurrence by the USFWS that your activities would be “not likely to adversely affect” listed species or critical habitat (for informal consultation)?

Yes, Tighe & Bond completed an informal consultation with the USFWS and determined that the Town’s discharges and discharge related activities are “not likely to adversely affect” listed species or critical habitat (see Attachment E).

- 4) Do you agree to implement all measures upon which the consultation was conditioned?

Yes, the Town of Danvers agrees to implement all measures upon which the consultation was conditioned.

- 5) Do you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the NOI that you will re-initiate informal or formal consultation with USFWS as necessary?”

Yes, during the course of the permit term the Town of Danvers agrees to conduct an endangered species screening for the proposed site and contact USFWS if they plan to install a structural BMP not identified in the NOI.

Tighe & Bond’s review of all questions under Step 2 resulted in “Yes” and thereby we determined the Town of Danvers’s action area meets the endangered species eligibility requirements included in Criterion B.

Attachment A

Appendix C of U.S. EPA's National Pollutant Discharge Elimination System (NPDES) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) in Massachusetts

APPENDIX C ENDANGERED SPECIES GUIDANCE

A. Background

In order to meet its obligations under the Clean Water Act and the Endangered Species Act (ESA), and to promote the goals of those Acts, the Environmental Protection Agency (EPA) is seeking to ensure the activities regulated by this general permit do not adversely affect endangered and threatened species or critical habitat. Applicants applying for permit coverage must assess the impacts of their stormwater discharges and discharge-related activities on federally listed endangered and threatened species (“listed species”) and designated critical habitat (“critical habitat”) to ensure that those goals are met. Prior to obtaining general permit coverage, applicants must meet the ESA eligibility provisions of this permit by following the steps in this Appendix¹.

Applicants also have an independent ESA obligation to ensure that their activities do not result in any prohibited “take” of listed species². The term “Take” is used in the ESA to include harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. “Harm” is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. “Harass” is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Many of the measures required in this general permit and in these instructions to protect species may also assist in ensuring that the applicant’s activities do not result in a prohibited take of species in violation of section 9 of the ESA. If the applicant has plans or activities in an area where endangered and threatened species are located, they may wish to ensure that they are protected from potential take liability under ESA section 9 by obtaining an ESA section 10 permit or by requesting formal consultation under ESA section 7. Applicants that are unsure whether to pursue a section 10 permit or a section 7 consultation for takings protection should confer with the appropriate United States Fish and Wildlife Service (USFWS) office or the National Marine Fisheries Service (NMFS), (jointly the Services).

Currently, there are 20 species of concern for applicants applying for permit coverage, namely the Dwarf wedgemussel (*Alasmidonta heterodon*), Northeastern bulrush (*Scirpus ancistrochaetus*), Sandplain gerardia (*Agalinis acuta*), Piping Plover (*Charadrius melodus*), Roseate Tern (*Sterna dougallii*), Northern Red-bellied cooter (*Pseudemys rubriventis*), Bog Turtle (*Glyptemys muhlenbergii*), Small whorled Pogonia (*Isotria medeoloides*), Puritan tiger beetle (*Cicindela puritana*), American burying beetle (*Nicrophorus americanus*), Northeastern beach tiger beetle (*Cicindela dorsalis*), Northern Long-eared Bat (*Myotis septentrionalis*), Atlantic Sturgeon (*Acipenser oxyrinchus*), Shortnose Sturgeon (*Acipenser brevirostrum*), North Atlantic Right Whale (*Eubalaena glacialis*), Humpback Whale (*Megaptera novaengliae*), Fin Whale (*Balaenoptera physalus*), Kemp’s Ridley Sea Turtle (*Lepidochelys kempii*), Loggerhead Sea Turtle (*Caretta caretta*), Leatherback Sea Turtle (*Dermochelys coriacea*), and the Green Turtle (*Chelonia*

¹ EPA strongly encourages applicants to begin this process at the earliest possible stage to ensure the notification requirements for general permit coverage are complete upon Notice of Intent (NOI) submission.

² Section 9 of the ESA prohibits any person from “taking” a listed species (e.g. harassing or harming it) unless: (1) the taking is authorized through an “incidental take statement” as part of completion of formal consultation according to ESA section 7; (2) where an incidental take permit is obtained under ESA section 10 (which requires the development of a habitat conversion plan; or (3) where otherwise authorized or exempted under the ESA. This prohibition applies to all entities including private individuals, businesses, and governments.

mydas). The Atlantic Sturgeon, Shortnose Sturgeon, North Atlantic Right Whale, Humpback Whale, Fin Whale, Loggerhead Sea Turtle, Kemp's Ridley Sea Turtle, Leatherback Sea Turtle and Green Turtle are listed under the jurisdiction of NMFS. The Dwarf wedgemussel, Northeastern bulrush, Sandplain gerardia, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Small whorled Pogonia, Roseate Tern, Puritan tiger beetle, Northeastern beach tiger beetle, Northern Long-eared Bat and American burying beetle are listed under the jurisdiction of the U.S. Fish and Wildlife Service.

Any applicant seeking coverage under this general permit, must consult with the Services where appropriate. When listed species are present, permit coverage is only available if EPA determines, or the applicant determines and EPA concurs, that the discharge or discharge related activities will have "no affect" on the listed species or critical habitat, or the applicant or EPA determines that the discharge or discharge related activities are "not likely to adversely affect" listed species or critical habitat and formal or informal consultation with the Services has been concluded and results in written concurrence by the Services that the discharge is "not likely to adversely affect" an endangered or threatened species or critical habitat.

EPA may designate the applicants as non-Federal representatives for the general permit for the purpose of carrying out formal or informal consultation with the Services (See 50 CFR §402.08 and §402.13). By terms of this permit, EPA has automatically designated operators as non-Federal representatives for the purpose of conducting formal or informal consultation with the U.S. Fish and Wildlife Service. EPA has not designated operators as non-Federal representatives for the purpose of conducting formal or informal consultation with the National Marine Fisheries Service. EPA has determined that discharges from MS4s are not likely to adversely affect listed species or critical habitat under the jurisdiction of the National Marine Fisheries Service. EPA has initiated informal consultation with the National Marine Fisheries Service on behalf of all permittees and no further action is required by permittees in order to fulfill ESA requirements of this permit related to species under the jurisdiction of NMFS

B. The U.S. Fish and Wildlife Service ESA Eligibility Process

Before submitting a notice of intent (NOI) for coverage by this permit, applicants must determine whether they meet the ESA eligibility criteria by following the steps in Section B of this Appendix. Applicants that cannot meet the eligibility criteria in Section B must apply for an individual permit.

The USFWS ESA eligibility requirements of this permit relating to the Dwarf wedgemussel, Northeastern bulrush, Sandplain gerardia, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Small whorled Pogonia, Roseate Tern, Puritan tiger beetle, Northeastern beach tiger beetle, Northern Long-eared Bat and American burying beetle may be satisfied by documenting that one of the following criteria has been met:

USFWS Criterion A: No endangered or threatened species or critical habitat are in proximity to the stormwater discharges or discharge related activities.

USFWS Criterion B: In the course of formal or informal consultation with the Fish and Wildlife Service, under section 7 of the ESA, the consultation resulted in either a no jeopardy opinion (formal consultation) or a written concurrence by USFWS on a finding that the stormwater discharges and

discharge related activities are “not likely to adversely affect” listed species or critical habitat (informal consultation).

USFWS Criterion C: Using the best scientific and commercial data available, the effect of the stormwater discharge and discharge related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by EPA, or by the applicant and affirmed by EPA, that the stormwater discharges and discharge related activities will have “no affect” on any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the USFWS.

1. The Steps to Determine if the USFWS ESA Eligibility Criteria Can Be Met

To determine eligibility, you must assess the potential effects of your known stormwater discharges and discharge related activities on listed species or critical habitat, PRIOR to completing and submitting a Notice of Intent (NOI). You must follow the steps outlined below and document the results of your eligibility determination.

Step 1 – Determine if you can meet USFWS Criterion A

USFWS Criterion A: You can certify eligibility, according to USFWS Criterion A, for coverage by this permit if, upon completing the Information, Planning, and Conservation (IPaC) online system process, you printed and saved the preliminary determination which indicated that federally listed species or designated critical habitats are not present in the action area. See Attachment 1 to Appendix C for instructions on how to use IPaC.

If you have met USFWS Criterion A skip to Step # 4.

If you have not met USFWS Criterion A, go to Step # 2.

Step 2 – Determine if You Can Meet Eligibility USFWS Criteria B

USFWS Criterion B: You can certify eligibility according to USFWS Criteria B for coverage by this permit if you answer “Yes” to **all** of the following questions:

- 1) Does your action area contain one or more of the following species: Sandplain gerardia, Small whorled Pogonia, American burying beetle, Dwarf wedgemussel, Northeastern bulrush, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Roseate Tern, Puritan tiger beetle, and Northeastern beach tiger beetle?
AND
- 2) Did your assessment of the discharge and discharge related activities indicate that the discharge or discharge related activities “may affect” or are “not likely to adversely affect” listed species or critical habitat?
AND
- 3) Did you contact the USFWS and did the formal or informal consultation result in either a “no jeopardy” opinion by the USFWS (for formal consultation) or concurrence by the

USFWS that your activities would be “not likely to adversely affect” listed species or critical habitat (for informal consultation)?

AND

- 4) Do you agree to implement all measures upon which the consultation was conditioned?
- 5) Do you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the NOI that you will re-initiate informal or formal consultation with USFWS as necessary?

Use the guidance below Step 3 to understand effects determination and to answer these questions.

If you answered “Yes” to all four questions above, you have met eligibility USFWS Criteria B. Skip to Step 4.

If you answered “No” to any of the four questions above, go to Step 3.

Step 3 – Determine if You Can Meet Eligibility USFWS Criterion C

USFWS Criterion C: You can certify eligibility according to USFWS Criterion C for coverage by this permit if you answer “Yes” to both of the following question:

- 1) Does your action area contain one or more of the following species: Northern Long-eared Bat, Sandplain gerardia, Small whorled Pogonia and/or American burying beetle and **does not** contain one any following species: Dwarf wedgemussel, Northeastern bulrush, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Roseate Tern, Puritan tiger beetle, and Northeastern beach tiger beetle?³
- OR
- 2) Did the assessment of your discharge and discharge related activities and indicate that there would be “no affect” on listed species or critical habitat and EPA provided concurrence with your determination?
- 3) Do you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the NOI that you will to conduct an endangered species screening for the proposed site and contact the USFWS if you determine that the new activity “may affect” or is “not likely to adversely affect” listed species or critical habitat under the jurisdiction of the USFWS.

Use the guidance below to understand effects determination and to answer these questions.

If you answered “Yes” to both the question above, you have met eligibility USFWS Criterion C. Go to Step 4.

If you answered “No” to either of the questions above, you are not eligible for coverage by this permit. You must submit an application for an individual permit for your stormwater discharges. (See 40 CFR 122.21).

USFWS Effects Determination Guidance:

If you are unable to certify eligibility under USFWS Criterion A, you must assess whether your stormwater discharges and discharge-related activities “may affect”, will have “no affect” or are “not likely to adversely affect” listed species or critical habitat. “Discharge-related activities” include: activities which cause, contribute to, or result in point source stormwater pollutant discharges; and measures to provide treatment for stormwater discharges including the siting, construction and operational procedures to control, reduce or prevent water pollution. Please be aware that no protection from incidental take liability is provided under this criterion.

The scope of effects to consider will vary with each system. If you are having difficulty in determining whether your system is likely to cause adverse effects to a listed species or critical habitat, you should contact the USFWS for assistance. In order to complete the determination of effects it may be necessary to follow the formal or informal consultation procedures in section 7 of the ESA.

Upon completion of your assessment, document the results of your effects determination. If your results indicate that stormwater discharges or discharge related activities will have “no affect” on threatened or endangered species or critical habitat and EPA concurs with your determination, you are eligible under USFWS Criterion C of this Appendix. Your determination may be based on measures that you implement to avoid, eliminate, or minimized adverse effects.

If the determination is “May affect” or “not likely to adversely affect” you must contact the USFWS to discuss your findings and measures you could implement to avoid, eliminate, or minimize adverse effects. If you and the USFWS reach agreement on measures to avoid adverse effects, you are eligible under USFWS Criterion B. Any terms and/or conditions to protect listed species and critical habitat that you relied on in order to complete an adverse effects determination, must be incorporated into your Storm Water Management Program (required by this permit) and implemented in order to maintain permit eligibility.

If endangered species issues cannot be resolved: If you cannot reach agreement with the USFWS on measures to avoid or eliminate adverse effects then you are not eligible for coverage under this permit. You must seek coverage under an individual permit.

Effects from stormwater discharges and discharge-related activities which could pose an adverse effect include:

- *Hydrological:* Stormwater discharges may cause siltation, sedimentation, or induce other changes in receiving waters such as temperature, salinity or pH. These effects will vary with the amount of stormwater discharged and the volume and condition of the receiving water. Where a discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely.
- *Habitat:* Excavation, site development, grading and other surface disturbance activities, including the installation or placement of treatment equipment may adversely affect listed species or their habitat. Stormwater from the small MS4 may inundate a listed species habitat.

- *Toxicity*: In some cases, pollutants in the stormwater may have toxic effects on listed species.

Step 4 - Document Results of the Eligibility Determination

Once the USFWS ESA eligibility requirements have been met, you shall include documentation of USFWS ESA eligibility in the Storm Water Management Program required by the permit. Documentation for the various eligibility criteria are as follows:

- USFWS Criterion A: A copy of the IPaC generated preliminary determination letter indicating that no listed species or critical habitat is present within your action area. You shall also include a statement on how you determined that no listed species or critical habitat are in proximity to your stormwater system or discharges.
- USFWS Criterion B: A dated copy of the USFWS letter of concurrence on a finding of “no jeopardy” (for formal consultation) or “not likely to adversely affect” (for informal consultation) regarding the ESA section 7 consultation.
- USFWS Criterion C: A dated copy of the EPA concurrence with the operator’s determination that the stormwater discharges and discharge-related activities will have “no affect” on listed species or critical habitat.

C. Submittal of Notice of Intent

Once the ESA eligibility requirements of Part C of this Appendix have been met you may submit the Notice of Intent indicating which Criterion you have met to be eligible for permit coverage. Signature and submittal of the NOI constitutes your certification, under penalty of law, of eligibility for permit coverage under 40 CFR 122.21.

D. Duty to Implement Terms and Conditions upon which Eligibility was Determined

You must comply with any terms and conditions imposed under the ESA eligibility requirements to ensure that your stormwater discharges and discharge related activities do not pose adverse effects or jeopardy to listed species and/or critical habitat. You must incorporate such terms and conditions into your Storm Water Management Program as required by this permit. If the ESA eligibility requirements of this permit cannot be met, then you may not receive coverage under this permit and must apply for an individual permit.

E. Services Information

United States Fish and Wildlife Service Office

National websites for Endangered Species Information:
Endangered Species home page: <http://endangered.fws.gov>
ESA Section 7 Consultations: <http://endangered.fws.gov/consultation/index.html>
Information, Planning, and Conservation System (IPAC): <http://ecos.fws.gov/ipac/>

U.S. FWS – Region 5
Supervisor

New England Field Office
U.S. Fish and Wildlife Services
70 Commercial Street, Suite 300
Concord, NH 03301

Natural Heritage Network

The Natural Heritage Network comprises 75 independent heritage program organizations located in all 50 states, 10 Canadian provinces, and 12 countries and territories located throughout Latin America and the Caribbean. These programs gather, manage, and distribute detailed information about the biological diversity found within their jurisdictions. Developers, businesses, and public agencies use natural heritage information to comply with environmental laws and to improve the environmental sensitivity of economic development projects. Local governments use the information to aid in land use planning.

The Natural Heritage Network is overseen by NatureServe, the Network's parent organization, and is accessible on-line at: http://www.natureserve.org/nhp/us_programs.htm, which provides websites and other access to a large number of specific biodiversity centers.

U.S. Fish and Wildlife IPaC system instructions

Use the following protocol to determine if any federally listed species or designated critical habitats under USFWS jurisdiction exist in your action area:

Enter your project specific information into the “Initial Project Scoping” feature of the Information, Planning, and Conservation (IPaC) system mapping tool, which can be found at the following location:

<http://ecos.fws.gov/ipac/>

- a. Indicate the action area¹ for the MS4 by either:
 - a. Drawing the boundary on the map or by uploading a shapefile. Select “Continue”

- c. Click on the “SEE RESOURCE LIST” button and on the next screen you can export a trust resources list. This will provide a list of natural resources of concern, which will include an Endangered Species Act Species list. You may also request an official species list under “REGULATORY DOCUMENTS” Save copies and retain for your records

¹ The action area is defined by regulation as all areas to be affected directly or indirectly by the action and not merely the immediate area involved in the action (50 CFR §402.02). This analysis is not limited to the "footprint" of the action nor is it limited by the Federal agency's authority. Rather, it is a biological determination of the reach of the proposed action on listed species. Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based upon the action area.

The documentation used by a Federal action agency to initiate consultation should contain a description of the action area as defined in the Services' regulations and explained in the Services' consultation handbook. If the Services determine that the action area as defined by the action agency is incorrect, the Services should discuss their rationale with the agency or applicant, as appropriate. Reaching agreement on the description of the action area is desirable but ultimately the Services can only consult when an action area is defined properly under the regulations.

For storm water discharges or discharge related activities, the action area should encompass the following:

- The immediate vicinity of, or nearby, the point of discharge into receiving waters.
- The path or immediate area through which or over which storm water flows from the municipality to the point of discharge into the receiving water. This includes areas in the receiving water downstream from the point of discharge.
- Areas that may be impacted by construction or repair activities. This extends as far as effects related to noise (from construction equipment, power tools, etc.) and light (if work is performed at night) may reach.

The action area will vary with the size and location of the outfall pipe, the nature and quantity of the storm water discharges, and the type of receiving waters, among other factors.

Attachment B
Danvers IPaC Official Species List



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

In Reply Refer To:
Consultation Code: 05E1NE00-2019-SLI-0397
Event Code: 05E1NE00-2019-E-02311
Project Name: Danvers MS4

February 27, 2019

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2019-SLI-0397

Event Code: 05E1NE00-2019-E-02311

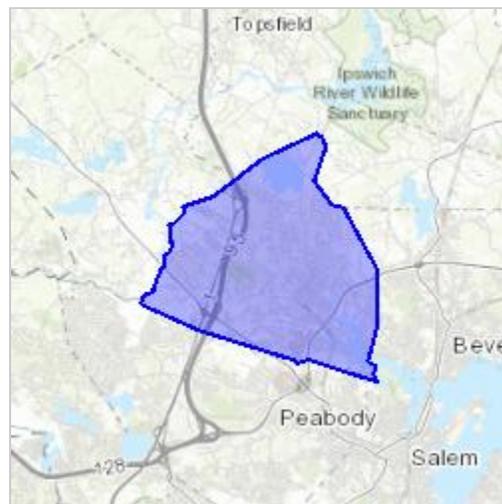
Project Name: Danvers MS4

Project Type: ** OTHER **

Project Description: As part of development of a Stormwater Management Plan, the Town of Danvers is completing the Endangered Species screening required by the 2016 Small MS4 General Permit.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/42.576807024815466N70.95203517523848W>



Counties: Essex, MA

Endangered Species Act Species

There is a total of 2 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
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.

Attachment C
Federally Listed Endangered and Threatened Species in
Massachusetts

**FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN
MASSACHUSETTS**

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Barnstable	Piping Plover	Threatened	Coastal Beaches	All Towns
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Chatham
	Sandplain gerardia	Endangered	Open areas with sandy soils.	Sandwich and Falmouth.
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Bourne (north of the Cape Cod Canal)
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Berkshire	Bog Turtle	Threatened	Wetlands	Egremont and Sheffield
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Bristol	Piping Plover	Threatened	Coastal Beaches	Fairhaven, Dartmouth, Westport
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Fairhaven, New Bedford, Dartmouth, Westport
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Taunton
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Dukes	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Piping Plover	Threatened	Coastal Beaches	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Aquinnah and Chilmark
	Sandplain gerardia	Endangered	Open areas with sandy soils.	West Tisbury
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

**FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES
IN MASSACHUSETTS**

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Essex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Gloucester, Essex and Manchester
	Piping Plover	Threatened	Coastal Beaches	Gloucester, Essex, Ipswich, Rowley, Revere, Newbury, Newburyport and Salisbury
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Franklin	Northeastern bulrush	Endangered	Wetlands	Montague, Warwick
	Dwarf wedgemussel	Endangered	Mill River	Whately
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Hampshire	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Hadley
	Puritan tiger beetle	Threatened	Sandy beaches along the Connecticut River	Northampton and Hadley
	Dwarf wedgemussel	Endangered	Rivers and Streams.	Hatfield, Amherst and Northampton
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Hampden	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Southwick
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Middlesex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Groton
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Nantucket	Piping Plover	Threatened	Coastal Beaches	Nantucket
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Nantucket
	American burying beetle	Endangered	Upland grassy meadows	Nantucket
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

**FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES
IN MASSACHUSETTS**

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Plymouth	Piping Plover	Threatened	Coastal Beaches	Scituate, Marshfield, Duxbury, Plymouth, Wareham and Mattapoisett
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Kingston, Middleborough, Carver, Plymouth, Bourne, Wareham, Halifax, and Pembroke
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Plymouth, Marion, Wareham, and Mattapoisett.
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Suffolk	Piping Plover	Threatened	Coastal Beaches	Revere, Winthrop
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Worcester	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Leominster
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

¹Migratory only, scattered along the coast in small numbers

-Eastern cougar and gray wolf are considered extirpated in Massachusetts.

-Endangered gray wolves are not known to be present in Massachusetts, but dispersing individuals from source populations in Canada may occur statewide.

-Critical habitat for the Northern Red-bellied Cooter is present in Plymouth County.

Attachment D

Northern Long-eared Bat Fact Sheet and Hibernaculum and
Maternity Roosts Location Map

Roseate Tern Fact Sheet



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

Northern Myotis *Myotis septentrionalis*

State Status: Endangered
Federal Status: Threatened

DESCRIPTION: The Northern Myotis is a small bat with large ears, which when pushed forward extend at least 4 mm past its nose. Its fur and wing membranes are light brown, giving it an overall somewhat uniform brown appearance. The hairs on its back are bicolored, with a dark base and lighter tip. The Northern Myotis averages 50-95 mm in total length, with a tail of 35-42 mm. In weight, it averages 5-8 g. This bat is typically found roosting in trees and feeding in forested habitats, but may occasionally be found in human habitations.

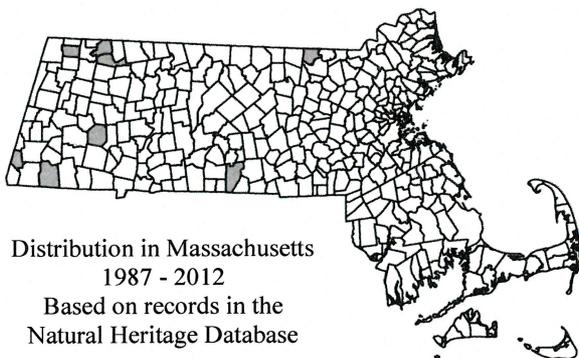
SIMILAR SPECIES: The best diagnostic character to distinguish the Northern Myotis from other species in Massachusetts is its long ears. The rare Little Brown Myotis (*Myotis lucifugus*, Endangered) and Indiana Myotis (*Myotis sodalis*, Endangered, federally Endangered) are similar in appearance, but have shorter ears which typically do not extend beyond their nose when pushed forward. The tragus, which is a fleshy projection which sticks up in front of the ear opening, is long and narrowly pointed in the Northern Myotis, while it is shorter and blunt in the Little Brown Myotis. The Little Brown Myotis also has glossier fur and a shorter tail relative to its body length. The Indiana Myotis has a



Photo: Tammy Ciesla, MassWildlife

keeled calcar (a ridge of cartilage between the foot and the tail), which the Northern Myotis lacks. Other features of interest in identification include the bat's hairless interfemoral membrane (the skin stretching between the legs and tail) and lack of a black face mask (which is characteristic of Small-footed Myotis, *Myotis leibii*, Endangered).

HABITAT IN MASSACHUSETTS: In the warmer months, colonies of Northern Myotis may be found roosting and foraging in forested areas. Preferred roosts are in clustered stands of large trees, especially in live or dead hardwoods with large, tall cavities. These bats are found in other tree roosts as well, and occasionally in human-made structures. Northern Myotis forage under the forest canopy in structurally complex habitats, often above small ponds, vernal pools or streams, along gravel paths or roads, and at the forest edge. The bats are widespread in Massachusetts, and have been found in 11



Distribution in Massachusetts
1987 - 2012
Based on records in the
Natural Heritage Database

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Massachusetts Division of Fisheries & Wildlife

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of 14 counties. In winter, Northern Myotis hibernate in natural caves and abandoned mines, preferring habitats where the humidity is so high that water droplets sometimes cover their fur. Winter hibernacula (hibernation sites) have been reported in Berkshire, Franklin, Hampden, Middlesex, and Worcester counties.

RANGE: The Northern Myotis is found across forested parts of the eastern United States and Canada, west to British Columbia, Wyoming, and Montana, and south into Florida. It was historically common in New England, the Canadian Maritimes, Quebec and Ontario, and uncommon in the western extremes of its range.

LIFE CYCLE/BEHAVIOR: In the summer months, Northern Myotis emerge at dusk from daytime roosts for the first in a series of feeding flights. Their long tails and large wing membranes allow the bats to fly slowly and navigate through cluttered environments. These special adaptations also enable them to glean prey from foliage, in addition to catching insects on the fly. These bats locate resting insects through a combination of passive listening and the emission of high frequency echolocation calls.

Between August and October, the body weight of Northern Myotis increases by up to 45%, as they store fat for winter. In late summer, the bats begin to “swarm” around the entrances of caves, and are thought to be testing the air of possible hibernacula. This is the time when mating occurs, with females storing the sperm within their bodies until spring. By early November, the bats enter hibernation sites. Their metabolisms slow and they enter torpor, but will rouse occasionally throughout the winter to drink water. Northern Myotis share caves with a number of other species, but tend to hibernate singly or in small groups in deep cracks or crevices. They return to the same hibernacula in multiple years, but may not hibernate in the same location every year. Little data are available on migration, but the bats are known to travel up to 56 km from foraging sites to winter hibernacula.

Females bear and rear single young from mid-May through July. The longevity record for the Northern Myotis is 18 years.

POPULATION STATUS IN MASSACHUSETTS, INCLUDING THREATS: The Northern Myotis is listed as Endangered under the Massachusetts

Endangered Species Act. All listed species are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. In addition, listed animals are specifically protected from activities that disrupt nesting, breeding, feeding, or migration.

Once a common species in the northern United States, populations of the Northern Myotis have been devastated by the spread of White-nose Syndrome. Populations in infected hibernacula in the Northeast have suffered catastrophic losses of 90-100%. White-nose Syndrome is caused by a newly described fungus, *Pseudogymnoascus destructans*, which is believed to be a non-native species accidentally introduced from caves in western Europe. European species of bats have co-evolved with this fungus, so they have a high degree of immunity. The fungus grows over bats while they hibernate, causing them to rouse from dormancy frequently, lose valuable stored fat, and fail to survive the winter. The fungus is believed to be passed from cave to cave primarily by the movements of breeding male bats, but human transport is also thought to be responsible for the infection of some hibernacula.

MANAGEMENT RECOMMENDATIONS: The U.S. Fish & Wildlife Service is working in concert with government and non-profit groups to understand the spread of the fungus and potential for stopping its spread, as well as exploring opportunities for captive breeding of the most vulnerable species. Access to suitable undisturbed hibernacula is essential to the survival of the Northern Myotis, and protection of known sites is paramount. Human disturbance of hibernacula can be discouraged or prevented with the use of gated entrances, in order to avoid arousal of hibernating bats and the spread of fungal spores.

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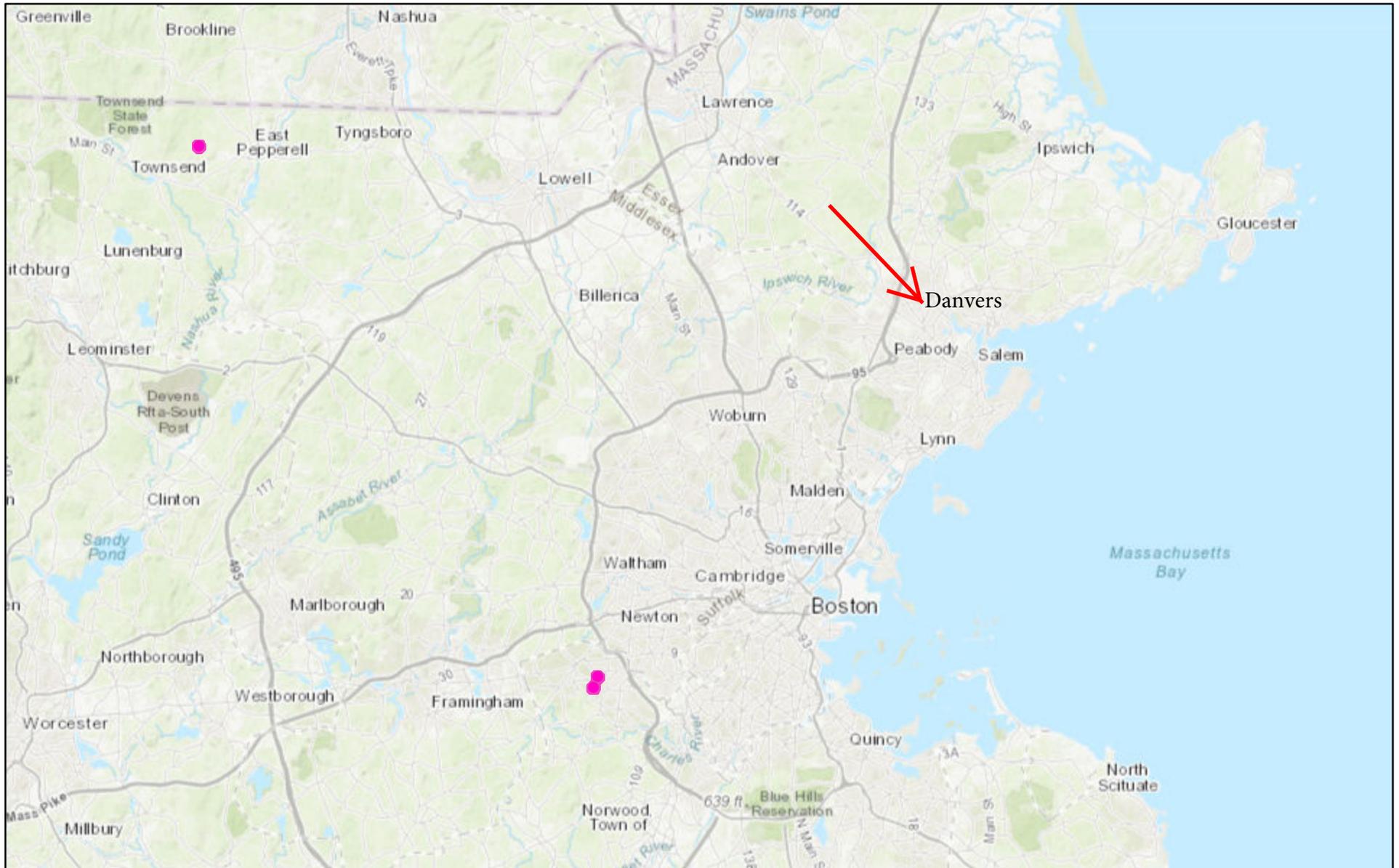
Updated 2015

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Northern Long-eared Bat Hibernacula & Maternity Roosts

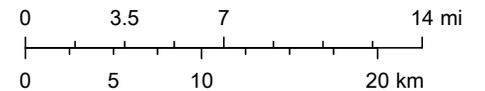


November 28, 2018

Statewide NLEB Symbology

- Hibernaculum
- MA Northern Long-eared Bat Winter Hibernacula (with ¼ mile buffer)

1:577,791



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS,



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

Roseate Tern *Sterna dougallii*

State Status: **Endangered**
Federal Status: **Endangered**

The elegant Roseate Tern, with its long, white tail-streamers and rapid flight, alights on Massachusetts beaches in the spring. It tunnels under vegetation to nest within colonies of its more rough-and-tumble relative, the Common Tern, from which it derives protection from intruders. The Roseate Tern is a plunge-diver that feeds mainly on the sand lance, and availability of this fish may influence the timing of breeding. Depredations of plume hunters in the 19th century and displacement from breeding sites by gulls and increased predation in the 20th century contributed to a decline in numbers and loss of major breeding sites in the northeast. In a sense, the Roseate Tern is emblematic of the Commonwealth, because for the past century, about half the northeastern population has nested in Buzzards Bay and outer Cape Cod. The Roseate is now considered an Endangered Species. The population, which increased from the 1980s through 2000, is now in decline. Several projects are in progress to restore the Roseate to historical breeding locations in Massachusetts.

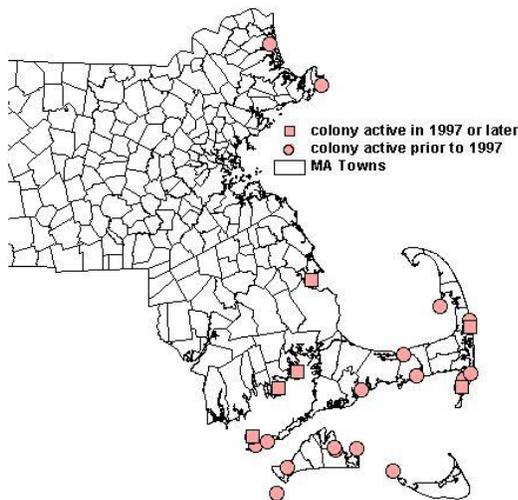


Figure 1. Distribution of present and historic Roseate Tern nesting colonies in Massachusetts.



Photo by B. Byrne, MDFW

DESCRIPTION: The Roseate Tern measures 33-41 cm in length and weighs 95-130 g. Breeding adults have pale gray upperparts, white underparts (flushed with pale pink early in the breeding season), a black cap, orange legs and feet, and a black bill (which becomes more red at the base as the season progresses). The tail is mostly white, and is deeply forked with two very long outer streamers, which extend well past the tips of the folded wings. In non-breeding adults, the forehead becomes white and the crown becomes white marked with black, merging with a black patch that extends from the eyes back to the nape. The down of hatchlings is distinctive: it is grizzled buff/black or gray/black, and is spiky-looking because the down filaments are gathered at the tips. Juveniles are buff or gray above, barred with black chevrons, and have a mottled forehead and crown, black eye-to-nape patch, and black bill and legs. The Roseate's vocal array includes a high-pitched *chi-vik* advertising call, and musical *kliu* and raspy *aaach* alarm calls, the latter sometimes likened to the sound of tearing cloth.

SIMILAR SPECIES IN MASSACHUSETTS: The Common Tern (*Sterna hirundo*) is similar in size, but has a black-tipped orange bill, darker gray upperparts,

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pale gray underparts, a shorter tail that does not extend beyond the folded wingtips, and an “irritable” voice. The Arctic Tern (*Sterna paradisaea*) is also similar in size, but has a shorter, blood-red bill, very short red legs, gray underparts with contrasting white cheeks, a shorter tail (which still extends past the folded wingtips), and a very different, high-pitched voice. The Least Tern (*Sternula antillarum*) is markedly smaller, with a yellow-orange bill, a white forehead, and a short tail.

DISTRIBUTION AND MIGRATION: The Roseate Tern has a scattered breeding distribution primarily in the tropical and sub-tropical Atlantic, Indian, and Pacific Oceans. In North America, it breeds in two discrete populations: from Nova Scotia south to New York and in the Caribbean. The northeast population, at about 40-45° N, is among the most northernmost nesting groups of this mostly tropical species. Roseates arrive in Massachusetts from late-April to mid-May to nest at just a handful of coastal locations (Fig. 1). The largest colonies occur in Buzzards Bay (see Status, below). Massachusetts birds depart from breeding colonies in late-July and August and concentrate in “staging areas” around Cape Cod and the Islands, before departure for wintering grounds in September. Roseates appear to feed offshore and return to the staging areas to rest and roost. Most have departed staging areas and have begun migrating southward by mid- to late-September. The Roseate’s wintering range remains poorly known, but increasing evidence indicates that Northeastern birds winter along the north and east coasts of South America southward along the coast of Brazil to approximately 18° S.

BREEDING AND FORAGING HABITAT: In Massachusetts, the Roseate Tern generally nests on sandy, gravelly, or rocky islands and, less commonly, in small numbers at the ends of long barrier beaches. Compared to the Common Tern, it selects nest sites with denser vegetation, such as seaside goldenrod and beach pea, which is also used for cover by chicks. Large boulders are used for cover at other locations in the northeast. It feeds in highly specialized situations over shallow sandbars, shoals, inlets or schools of predatory fish, which drive smaller prey to the surface. The Roseate is known to forage up to 30 km from the breeding colony.

FOOD HABITS: The Roseate Tern feeds almost exclusively on small fish; occasionally it includes

crustaceans in its diet. It is fairly specialized, consuming primarily sand lance (about 70% of diet in Massachusetts). Other prey species of importance in Massachusetts are herrings, bluefish, mackerel, silversides, and anchovies. In the northeast, it often forages with Common Terns. The Roseate captures food mainly by plunge-diving (diving from heights of 1-12 m and often submerging to ≥ 50 cm), but also by surface-dipping and contact-dipping. Some individuals specialize in stealing fish from Common Terns.

BREEDING:

Phenology. Roseates usually begin to arrive in Massachusetts in late-April or the first week of May. Egg dates are 12 May to 18 August, and laying usually begins about 8 days later than that of Common Terns in the host colony. Incubation lasts about 3 weeks, and the nestling period about 4 weeks.

Colony. The Roseate Tern is gregarious. In the northeast it nests in colonies of a few to about 1,700 pairs, and the largest colony in Massachusetts numbers about 1,100 pairs (see Status, below). In this portion of its range, the Roseate invariably nests with the Common Tern, forming clusters or sub-colonies within larger Common Tern colonies. Pairs defend their nest site. (See also Predation, below.)

Pair-bond. Courtship involves both aerial and ground displays, including spectacular High Flights (in which ≥ 2 birds spiral up to 30-300 m above ground and then descend in a zig-zag glide), and Low Flights (in which a fish-carrying male is chased by up to 12 other birds). Males feed females before and during the egg-laying period. The Roseate Tern is socially monogamous, but extra-pair copulations occur. Both parents spend roughly equal amounts of time incubating, and incubation shifts last about 26 minutes. Males and females also contribute approximately equally to brooding and feeding chicks. The average length of pair bonds in Connecticut was 2.5 years. The sex ratio in Massachusetts (and probably other northeast colonies) is skewed towards females (1.27 females:1 male). This results in multi-female associations (≥ 2 females), and often ≥ 3 -egg clutches, at nests.

Nests. Nests (usually beneath vegetation or debris, or in special nest boxes) are depressions or “scrapes” in the substrate, to which nesting material may or may not be added throughout incubation. In the northeast, nests are usually 50-250 cm apart, depending on the distribution of vegetation and rocks.

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Eggs. Eggs are various shades of brown with dark spots and streaks. The second egg may be paler than the first. Eggs measure approximately 43 x 30 mm, and are subelliptical in shape. The eggs are difficult to distinguish from those of the Common Tern, but Roseate eggs are generally longer, more conical, less rounded, darker, and more uniformly and finely spotted. Clutch size is usually 1-2 eggs; older females generally lay 2 eggs (laid about 3 days apart), and younger females, 1 egg. Nests with ≥ 3 eggs are often attended by more than one female. Incubation, which begins after laying of the first egg, may be sporadic until the second egg is laid. The period between laying and hatching is about 23 days for both eggs.

Young. Chicks are semi-precocial. They are downy at hatching. Eyes open after a couple hours, and chicks are able to waddle and take food within hours after hatching. In 2-chick broods, there is often a substantial size difference between the young that persists throughout the growth period; this is because the first chick (*A*-chick) is usually 3 days older. Chicks are brooded/attended most of the day and night for the first few days of life. Parental attendance ceases after about a week, except for cold, rainy days. Parents carry prey to chicks in their bills one fish at a time. Feeding rates at sites in Massachusetts and Connecticut are about 1 fish/hour. At sheltered nests, undisturbed chicks may remain at the nest site until they are nearly fledged. Where there is more disturbance, chicks may move more than 60 m away to new hiding spots. In 2-chick broods, the younger chick (*B*-chick) is less likely to survive than the *A*-chick. Most losses of *B*-chicks appear to be due to starvation. The peak of fledging is at 27-30 days. Four to 10 days after fledging, young birds accompany parents to fishing grounds. They begin to catch fish after 3 weeks, but remain dependent on parents for food at least 6 weeks, or until migration in September. This notably long period of dependence reflects the highly specialized fishing techniques that the young must master. At Bird I., MA, family units depart the nesting colony 5-15 days post-fledging to congregate at staging locations. When two chicks are raised, the male leaves first with the older chick and the female leaves up to 7 days later with the younger chick. Nothing is known of family cohesion during migration.

PREDATION:

Predators. In North America, predators of Roseate Tern eggs, young, and adults include birds and mammals, snakes, ants, and land crabs. In the northeast, the Great

Horned Owl is the primary predator on adults, and predation on adults by the Peregrine Falcon has also been documented. Other significant avian predators (on eggs or chicks) include: Black-crowned Night-Heron, Herring and Great Black-backed Gulls, American Crow, and Red-winged Blackbird.

Responses to predators and intruders. The Roseate Tern prefers to nest on islands lacking mammalian predators. Eggs and chicks are cryptically colored and well-concealed under vegetation, debris, or rocks. Roseates are less aggressive birds than Common Terns, and rely on Commons for defense in the nesting colony. Attack rate peaks at hatching. Roseates dive at, and sometimes strike, various avian predators. Roseates circle above humans and dive at them, but do not make physical contact or defecate on them. Roseates in the Caribbean have been shown to respond more vigorously to familiar *versus* unfamiliar humans. As is the case for Common Terns, Roseates desert colonies at night when subject to nocturnal predation. This prolongs incubation periods for eggs, and exposes eggs and chicks to the elements and predation. Roseate nests and chicks, however, are better concealed, and thus less vulnerable, than those of Common Terns. Roseate adults, in contrast, are often disproportionately preyed upon in comparison to Common Terns from the same colony. Perhaps for this reason Roseates are quicker to abandon a site when predators are active.

LIFE HISTORY PARAMETERS: In Massachusetts, most Roseate Terns breed annually starting at 3 years old, some at ≥ 4 years. Only one brood per season is raised, but birds reneest after losing eggs or chicks. Estimating productivity is challenging due to inaccessible nest sites and chicks' hiding behavior, but productivity usually exceeds 1 chick fledged per pair (range: 0-1.6 chicks fledged per pair); older birds are more productive than younger ones. Survival from fledging to first breeding was estimated at about 20% for Connecticut birds. Annual survival of adults in the northeast was estimated to be about 80%. The oldest Roseate Tern documented was 25.6 years old; it was originally banded as a chick in Massachusetts.

STATUS: The northeastern population of the Roseate Tern is listed as Endangered federally and in Massachusetts principally because of its range contraction and secondarily because of its declining numbers. Prior to 1870, its status was somewhat obscure, but the Roseate was considered to be an

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abundant breeder within Common Tern colonies on Nantucket and Muskeget Is., MA. Prior to the 20th century, eggging was a problem in northeast colonies, but it was persecution of terns for the plume industry that greatly reduced numbers in the northeast to perhaps 2,000 pairs, mostly at Muskeget and Penikese Is., MA, by the 1880s. Following protection, numbers rose to the 8,500 pair level in 1930. From the 1930s through the 1970s, Roseates were displaced from nesting colonies by Herring and Great Black-backed Gulls, and had declined to 2,500 pairs by 1979. Following two decades of fairly steady increase, the Northeast U.S. population peaked at 4,310 pairs in 2000. Since then, however, the population has declined rapidly to 3,320 pairs (Roseate Tern Recovery Team, unpubl. 2006 data). The cause of this has not been identified, but data suggest that it may be related to mortality on the wintering grounds. Approximately 85% of the population is dangerously concentrated at just 3 colonies: Great Gull Island, NY (1,227 pairs); Bird I., Marion, MA (1,111); and Ram I., Mattapoisett, MA (463). The only other nesting colonies in Massachusetts in 2006 were at Penikese I. (48 pairs) and Monomoy National Wildlife Refuge (NWR) (S. Monomoy and Minimoy Is.), Chatham (26 pairs). Desertion of ≥ 30 major breeding sites over the past 80 years in most cases has been related to occupation of sites by gulls, and secondarily, to predation in the colonies (which may have intensified as terns were displaced by gulls to sites closer to the mainland). While populations in the state receive protection during the breeding season, the species is unprotected by South

American governmental entities and while in international waters. Prior to the 1980s, persecution by humans (trapping for food) on the wintering grounds may have affected Roseates nesting in the northeast. Major wintering areas for this population have not been identified; this, along with investigation of current threats on the wintering grounds, is badly needed.

CONSERVATION AND MANAGEMENT: Colonies are protected by posting of signs, by presence of wardens, and/or by exclusion of visitors. Wooden nest boxes and boards, partially buried tires, and other structures enhance the number of potential nest sites. Vegetation control is sometimes necessary when plant growth is dense enough to actually impede adults' ability to access nesting sites. The gradual loss of breeding sites in the Northeast, coupled with the Roseate's reluctance to colonize new sites, is a serious obstacle to recovery of the northeast population. The current overwhelming concentration of Roseates in Massachusetts in just two colonies in Buzzards Bay (Bird and Ram Is.), despite suitable conditions elsewhere, does not bode well for the population should one of these sites become unsuitable. Because of the regional importance of Massachusetts for Roseate recovery, several restoration projects have been initiated in the state. Restoring Common Terns to nesting sites is a necessary first step in restoring Roseates because of the Roseate's close association with the Common Tern at breeding colonies. Roseates were successfully restored to Ram I. after a gull control program in 1990-1991. A similar program at Monomoy NWR, begun in 1996, encouraged the expansion of a huge colony of Common Terns (9,747 pairs in 2005), but only a handful of Roseates nest there. Two other tern restoration projects -- at Penikese I., in Buzzards Bay, and at Muskeget I., in Nantucket Sound -- are currently underway, both involving aggressive discouragement of gulls from small portions of the islands; Roseates returned to Penikese in 2003, but numbers have fluctuated widely since then. Tern restoration is a long-term commitment that requires annual monitoring and management to track progress, identify threats, manage vegetation, prevent gulls from encroaching on colonies, and remove predators.

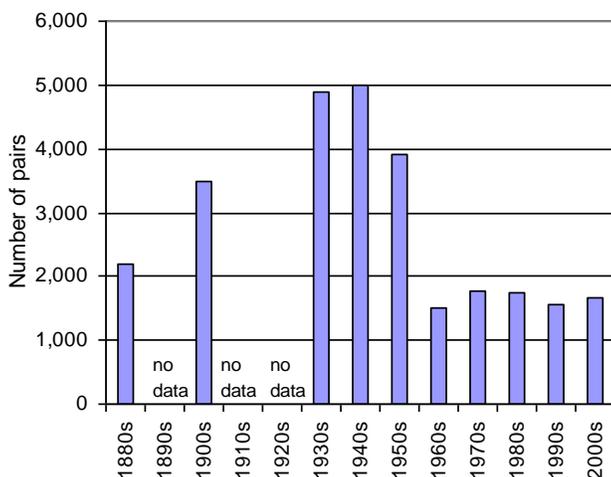


Figure 2. Roseate Tern population trends in Massachusetts, 1880s to 2006 (modified from Blodget and Melvin 1996).

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Updated 2015
Prepared by C.S. Mostello 2007

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Attachment E

U.S. Fish and Wildlife New England Field Office Review Letter



United States Department of the Interior



FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial St, Suite 300
Concord, NH 03301-5087
<http://www.fws.gov/newengland>

September 24, 2018

To whom it may concern:

The U.S. Fish and Wildlife Service (USFWS) reviewed the stormwater discharge activities associated with the 2016 National Pollutant Discharge and Elimination System (NPDES) Massachusetts (MA) Small Municipal Separate Storm Sewer System (MS4) general permit (MA MS4 General Permit) issued by the Environmental Protection Agency (EPA). We determined those activities may affect, but are not likely to adversely affect, certain species listed under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) when specific conditions are met. When these conditions are met, we do not need to review individual projects. These comments are provided in accordance with section 7 of the ESA and complement existing 2016 MA MS4 General Permit Appendix C Guidance. We understand the applicant is acting as a non-Federal representative of the EPA for the purpose of consultation under section 7. **This letter provides additional guidance for meeting Criterion B and should be submitted as part of your application package to the EPA.**

If the USFWS Information for Planning and Consultation website (<https://ecos.fws.gov/ipac/>) indicates your MA MS4 General Permit project action area may contain one or more of the following federally listed endangered species: roseate tern (*Sterna dougallii*), northern red-bellied cooter (*Pseudemys rubriventris*), dwarf wedgemussel (*Alasmidonta heterodon*), rusty patched bumble bee (*Bombus affinis*), northeastern bulrush (*Scirpus ancistrochaetus*), or American chaffseed (*Schwalbea americana*); threatened species: piping plover (*Charadrius melodus*), bog turtle (*Glyptemys muhlenbergii*), Puritan tiger beetle (*Cicindela puritana*), northeastern beach tiger beetle (*Cicindela dorsalis*), or red knot (*Calidris canutus rufa*); or their federally designated critical habitat; and the specific conditions listed below are met, you may submit this letter to complete the **MA MS4 General Permit Appendix C: Step 4** in place of a concurrence letter for informal consultation as documentation of ESA eligibility for **USFWS Criterion B**.

In addition, this letter also satisfies the requirement in the **MA MS4 General Permit Appendix C: Step 2 (3)** to contact the USFWS and obtain a concurrence letter, if you have not yet done so. If your project action area includes one or more of the above-listed species *and* one or more of the

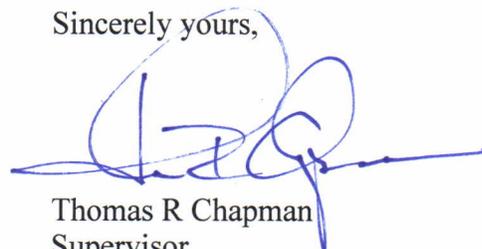
species listed under **Criterion C**,¹ you may still use this letter to certify under **Criterion B**. All existing guidance regarding requirements for certifying eligibility according to the USFWS Criterion A, B, or C for coverage by the 2016 MS4 Permit (see MA MS4 General Permit Appendix C – Endangered Species Guidance) remains unchanged.

We have determined that proposed stormwater discharge activities covered under the 2016 MS4 Permit *may affect, but are not likely to adversely affect*, the above-listed species and the species' critical habitat when the following are true:

1. all stormwater discharges are pre-existing or previously permitted by EPA;
2. any planned operations and maintenance work covered by this permit will only affect previously disturbed areas where stormwater controls are already installed. In these situations the chance of encountering any of the subject species is discountable;
3. the project implements EPA MS4 Best Management Practices (BMPs) and meets Clean Water Act and Massachusetts Water Quality Standards. Although permitted discharges may reach the environment used by these species, BMPs reduce pollutants to the extent that discharges are not known to have measurable impacts on these species or their habitat;
4. no new construction or structural BMPs are proposed under this permit at this time; and
5. you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the Notice of Intent (NOI), you will re-initiate consultation with the USFWS as necessary (see **MA MS4 General Permit Appendix C: Step 2 (5)**).

If the above criteria are met, further consultation with the USFWS under section 7 of the ESA is not required at this time; however, if the proposed action changes in any way such that it may affect a listed species in a manner not previously analyzed or if new information reveals the presence of additional listed species that may be affected by the project, the applicant or the EPA should contact us immediately and suspend activities that may affect those species until the appropriate level of consultation is completed with our office. Thank you for your cooperation, and please contact David Simmons of this office at (603) 227-6425 if you have questions or need further assistance.

Sincerely yours,



Thomas R Chapman
Supervisor
New England Field Office

¹ Criterion C includes guidance for project action areas that may contain species for which EPA has already made a determination. These species include the northern long-eared bat (*Myotis septentrionalis*), sandplain gerardia (*Agalinis acuta*), small whorled pogonia (*Isotria medeoloides*), and/or American burying beetle (*Nicrophorus americanus*) (MA MS4 General Permit Appendix C: Step 3 – Determine if You Can Meet Eligibility USFWS Criterion C).

Endangered Species Act Eligibility Certification

To: Town of Danvers Stormwater Management Program Files
FROM: Tighe & Bond
COPY: Richard Rodgers, P.E., Town Engineer
DATE: November 28, 2017

Tighe & Bond has completed the National Endangered Species Eligibility Determination screening process in accordance with Part 1.9.1 and Appendix C of U.S. EPA's National Pollutant Discharge Elimination System (NPDES) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) in Massachusetts (see Attachment A of this memorandum), effective July 1, 2018¹, and determined that the **Town of Danvers** meets **Criterion C**, where informal consultation with U.S. Fish and Wildlife Service (USFWS) resulted in a finding that the stormwater discharges and discharge related activities will have "no affect" on listed species or critical habitat.

Tighe & Bond followed EPA's screening process required by the 2016 Small MS4 General Permit as follows:

Tighe & Bond went to the USFWS Information for Planning and Consultation (IPaC) website² and created an IPaC Trust Resources Report, included in Attachment B to this memorandum. This Report lists the following species that may occur or could potentially be affected by activities in the Town:

- Northern Long-eared Bat.

This report documents that there are no critical habitats in Danvers.

Tighe & Bond then went to the USFWS New England Field Office website for Endangered Species Reviews/Consultations³ and selected the Massachusetts state list⁴ to review which Towns have federally-listed species. A copy of the list of Federally Listed Endangered and Threatened Species in Massachusetts is included in Attachment C to this memorandum. Based on review of this list, the Northern Long-eared Bat is listed statewide.

Tighe & Bond then reviewed Step 1 Part B of the USFWS endangered species consultation, and visited the Massachusetts Natural Heritage and Endangered Species Program (NHESP) species information and conservation website about the Northern Long-eared Bat⁵. The NHESP website included a map showing the known locations of the Northern Long-eared Bat within Massachusetts. Attachment D includes a map showing there are no roost trees or hibernating locations within Danvers. Based on the results of the NHESP website review, Tighe & Bond determined there is no potential habitat for any USFWS listed endangered species within the action area and therefore no further coordination is required with the USFWS.

¹ Revised General Permit effective date according to June 29, 2017 EPA memorandum from EPA Region 1 Acting Regional Administrator.

² <http://ecos.fws.gov/ipac/>

³ https://www.fws.gov/newengland/EndangeredSpec-Consultation_Project_Review.htm

⁴ <https://www.fws.gov/newengland/pdfs/MA%20species%20by%20town.pdf>

⁵ <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/species-information-and-conservation/rare-mammals/northern-long-eared-bat.html>

Attachment E provides the results of Tighe & Bond's informal consultation on behalf of the Town of Danvers with USFWS "no species present" letter that states "no species are known to occur in the project area".

Step 1 – Determine if you can meet USFWS Criterion A

"USFWS Criterion A: You can certify eligibility, according to USFWS Criterion A, for coverage by this permit if, upon completing the Information, Planning, and Conservation (IPaC) online system process, you printed and saved the preliminary determination which indicated that federally listed species or designated critical habitats are not present in the action area. See Attachment 1 to Appendix C for instructions on how to use IPaC."

No, the Town of Danvers's IPaC action area contains the Northern Long-eared Bat.

Step 2 – Determine if You Can Meet Eligibility USFWS Criteria B

"USFWS Criterion B: You can certify eligibility according to USFWS Criteria B for coverage by this permit if you answer "Yes" to **all** of the following questions:

- 1) Does your action area contain one or more of the following species: Sandplain gerardia, Small whorled Pogonia, American burying beetle, Dwarf wedgemussel, Northeastern bulrush, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Roseate Tern, Puritan tiger beetle, and Northeastern beach tiger beetle?"

No, the Town of Danvers's action area does not contain any of the above species.

Step 3 – Determine if You Can Meet Eligibility USFWS Criteria C

"You can certify eligibility according to USFWS Criterion C for coverage by this permit if you answer "Yes" to both of the following questions:

- 1) Does your action area contain one or more of the following species: Northern Long-eared Bat, Sandplain gerardia, Small whorled Pogonia and/or American burying beetle and does not contain any following species: Dwarf wedgemussel, Northeastern bulrush, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Roseate Tern, Puritan tiger beetle, and Northeastern beach tiger beetle?

Yes, the Town of Danvers's action area contains the Northern Long-eared Bat, but none of the other subsequent species.

- 2) Did the assessment of your discharge and discharge related activities indicate that there would be "no affect" on listed species or critical habitat and EOA provided concurrence with your determination?

Yes, Tighe & Bond performed an informal consultation with USFWS and determined that the Town's discharges and discharge related activities will have "no affect" on listed species or critical habitat (see discussion above).

- 3) Do you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the NOI that you will conduct an endangered species screening for the proposed site and contact the USFWS if you determine that the new activity "may affect" or is "not likely to adversely affect" listed species or critical habitat under the jurisdiction of the USFWS."

Yes, during the course of the permit term the Town of Danvers agrees to conduct an endangered species screening for the proposed site and contact USFWS if they plan to install a structural BMP not identified in the NOI.

Tighe & Bond's review of all five questions under Step 3 resulted in "Yes" and thereby we determined the Town of Danvers's action area meets the endangered species' eligibility requirements included in Criterion C.

J:\D\D0282 Danvers, MA On-call Assistance\01 On-Call Stormwater Assistance\REPORT\SWMP Appendices\Appendix C - ESA\Endangered Species Act Eligibility Certification_Final.docx

Attachment A

Appendix C of U.S. EPA's National Pollutant Discharge Elimination System (NPDES) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) in Massachusetts

APPENDIX C ENDANGERED SPECIES GUIDANCE

A. Background

In order to meet its obligations under the Clean Water Act and the Endangered Species Act (ESA), and to promote the goals of those Acts, the Environmental Protection Agency (EPA) is seeking to ensure the activities regulated by this general permit do not adversely affect endangered and threatened species or critical habitat. Applicants applying for permit coverage must assess the impacts of their stormwater discharges and discharge-related activities on federally listed endangered and threatened species (“listed species”) and designated critical habitat (“critical habitat”) to ensure that those goals are met. Prior to obtaining general permit coverage, applicants must meet the ESA eligibility provisions of this permit by following the steps in this Appendix¹.

Applicants also have an independent ESA obligation to ensure that their activities do not result in any prohibited “take” of listed species². The term “Take” is used in the ESA to include harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. “Harm” is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. “Harass” is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Many of the measures required in this general permit and in these instructions to protect species may also assist in ensuring that the applicant’s activities do not result in a prohibited take of species in violation of section 9 of the ESA. If the applicant has plans or activities in an area where endangered and threatened species are located, they may wish to ensure that they are protected from potential take liability under ESA section 9 by obtaining an ESA section 10 permit or by requesting formal consultation under ESA section 7. Applicants that are unsure whether to pursue a section 10 permit or a section 7 consultation for takings protection should confer with the appropriate United States Fish and Wildlife Service (USFWS) office or the National Marine Fisheries Service (NMFS), (jointly the Services).

Currently, there are 20 species of concern for applicants applying for permit coverage, namely the Dwarf wedgemussel (*Alasmidonta heterodon*), Northeastern bulrush (*Scirpus ancistrochaetus*), Sandplain gerardia (*Agalinis acuta*), Piping Plover (*Charadrius melodus*), Roseate Tern (*Sterna dougallii*), Northern Red-bellied cooter (*Pseudemys rubriventis*), Bog Turtle (*Glyptemys muhlenbergii*), Small whorled Pogonia (*Isotria medeoloides*), Puritan tiger beetle (*Cicindela puritana*), American burying beetle (*Nicrophorus americanus*), Northeastern beach tiger beetle (*Cicindela dorsalis*), Northern Long-eared Bat (*Myotis septentrionalis*), Atlantic Sturgeon (*Acipenser oxyrinchus*), Shortnose Sturgeon (*Acipenser brevirostrum*), North Atlantic Right Whale (*Eubalaena glacialis*), Humpback Whale (*Megaptera novaengliae*), Fin Whale (*Balaenoptera physalus*), Kemp’s Ridley Sea Turtle (*Lepidochelys kempii*), Loggerhead Sea Turtle (*Caretta caretta*), Leatherback Sea Turtle (*Dermochelys coriacea*), and the Green Turtle (*Chelonia*

¹ EPA strongly encourages applicants to begin this process at the earliest possible stage to ensure the notification requirements for general permit coverage are complete upon Notice of Intent (NOI) submission.

² Section 9 of the ESA prohibits any person from “taking” a listed species (e.g. harassing or harming it) unless: (1) the taking is authorized through an “incidental take statement” as part of completion of formal consultation according to ESA section 7; (2) where an incidental take permit is obtained under ESA section 10 (which requires the development of a habitat conversion plan; or (3) where otherwise authorized or exempted under the ESA. This prohibition applies to all entities including private individuals, businesses, and governments.

mydas). The Atlantic Sturgeon, Shortnose Sturgeon, North Atlantic Right Whale, Humpback Whale, Fin Whale, Loggerhead Sea Turtle, Kemp's Ridley Sea Turtle, Leatherback Sea Turtle and Green Turtle are listed under the jurisdiction of NMFS. The Dwarf wedgemussel, Northeastern bulrush, Sandplain gerardia, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Small whorled Pogonia, Roseate Tern, Puritan tiger beetle, Northeastern beach tiger beetle, Northern Long-eared Bat and American burying beetle are listed under the jurisdiction of the U.S. Fish and Wildlife Service.

Any applicant seeking coverage under this general permit, must consult with the Services where appropriate. When listed species are present, permit coverage is only available if EPA determines, or the applicant determines and EPA concurs, that the discharge or discharge related activities will have "no affect" on the listed species or critical habitat, or the applicant or EPA determines that the discharge or discharge related activities are "not likely to adversely affect" listed species or critical habitat and formal or informal consultation with the Services has been concluded and results in written concurrence by the Services that the discharge is "not likely to adversely affect" an endangered or threatened species or critical habitat.

EPA may designate the applicants as non-Federal representatives for the general permit for the purpose of carrying out formal or informal consultation with the Services (See 50 CFR §402.08 and §402.13). By terms of this permit, EPA has automatically designated operators as non-Federal representatives for the purpose of conducting formal or informal consultation with the U.S. Fish and Wildlife Service. EPA has not designated operators as non-Federal representatives for the purpose of conducting formal or informal consultation with the National Marine Fisheries Service. EPA has determined that discharges from MS4s are not likely to adversely affect listed species or critical habitat under the jurisdiction of the National Marine Fisheries Service. EPA has initiated informal consultation with the National Marine Fisheries Service on behalf of all permittees and no further action is required by permittees in order to fulfill ESA requirements of this permit related to species under the jurisdiction of NMFS

B. The U.S. Fish and Wildlife Service ESA Eligibility Process

Before submitting a notice of intent (NOI) for coverage by this permit, applicants must determine whether they meet the ESA eligibility criteria by following the steps in Section B of this Appendix. Applicants that cannot meet the eligibility criteria in Section B must apply for an individual permit.

The USFWS ESA eligibility requirements of this permit relating to the Dwarf wedgemussel, Northeastern bulrush, Sandplain gerardia, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Small whorled Pogonia, Roseate Tern, Puritan tiger beetle, Northeastern beach tiger beetle, Northern Long-eared Bat and American burying beetle may be satisfied by documenting that one of the following criteria has been met:

USFWS Criterion A: No endangered or threatened species or critical habitat are in proximity to the stormwater discharges or discharge related activities.

USFWS Criterion B: In the course of formal or informal consultation with the Fish and Wildlife Service, under section 7 of the ESA, the consultation resulted in either a no jeopardy opinion (formal consultation) or a written concurrence by USFWS on a finding that the stormwater discharges and

discharge related activities are “not likely to adversely affect” listed species or critical habitat (informal consultation).

USFWS Criterion C: Using the best scientific and commercial data available, the effect of the stormwater discharge and discharge related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by EPA, or by the applicant and affirmed by EPA, that the stormwater discharges and discharge related activities will have “no affect” on any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the USFWS.

1. The Steps to Determine if the USFWS ESA Eligibility Criteria Can Be Met

To determine eligibility, you must assess the potential effects of your known stormwater discharges and discharge related activities on listed species or critical habitat, PRIOR to completing and submitting a Notice of Intent (NOI). You must follow the steps outlined below and document the results of your eligibility determination.

Step 1 – Determine if you can meet USFWS Criterion A

USFWS Criterion A: You can certify eligibility, according to USFWS Criterion A, for coverage by this permit if, upon completing the Information, Planning, and Conservation (IPaC) online system process, you printed and saved the preliminary determination which indicated that federally listed species or designated critical habitats are not present in the action area. See Attachment 1 to Appendix C for instructions on how to use IPaC.

If you have met USFWS Criterion A skip to Step # 4.

If you have not met USFWS Criterion A, go to Step # 2.

Step 2 – Determine if You Can Meet Eligibility USFWS Criteria B

USFWS Criterion B: You can certify eligibility according to USFWS Criteria B for coverage by this permit if you answer “Yes” to **all** of the following questions:

- 1) Does your action area contain one or more of the following species: Sandplain gerardia, Small whorled Pogonia, American burying beetle, Dwarf wedgemussel, Northeastern bulrush, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Roseate Tern, Puritan tiger beetle, and Northeastern beach tiger beetle?
AND
- 2) Did your assessment of the discharge and discharge related activities indicate that the discharge or discharge related activities “may affect” or are “not likely to adversely affect” listed species or critical habitat?
AND
- 3) Did you contact the USFWS and did the formal or informal consultation result in either a “no jeopardy” opinion by the USFWS (for formal consultation) or concurrence by the

USFWS that your activities would be “not likely to adversely affect” listed species or critical habitat (for informal consultation)?

AND

- 4) Do you agree to implement all measures upon which the consultation was conditioned?
- 5) Do you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the NOI that you will re-initiate informal or formal consultation with USFWS as necessary?

Use the guidance below Step 3 to understand effects determination and to answer these questions.

If you answered “Yes” to all four questions above, you have met eligibility USFWS Criteria B. Skip to Step 4.

If you answered “No” to any of the four questions above, go to Step 3.

Step 3 – Determine if You Can Meet Eligibility USFWS Criterion C

USFWS Criterion C: You can certify eligibility according to USFWS Criterion C for coverage by this permit if you answer “Yes” to both of the following question:

- 1) Does your action area contain one or more of the following species: Northern Long-eared Bat, Sandplain gerardia, Small whorled Pogonia and/or American burying beetle and **does not** contain one any following species: Dwarf wedgemussel, Northeastern bulrush, Piping Plover, Northern Red-bellied cooter, Bog Turtle, Roseate Tern, Puritan tiger beetle, and Northeastern beach tiger beetle?³
- OR
- 2) Did the assessment of your discharge and discharge related activities and indicate that there would be “no affect” on listed species or critical habitat and EPA provided concurrence with your determination?
 - 3) Do you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the NOI that you will to conduct an endangered species screening for the proposed site and contact the USFWS if you determine that the new activity “may affect” or is “not likely to adversely affect” listed species or critical habitat under the jurisdiction of the USFWS.

Use the guidance below to understand effects determination and to answer these questions.

If you answered “Yes” to both the question above, you have met eligibility USFWS Criterion C. Go to Step 4.

If you answered “No” to either of the questions above, you are not eligible for coverage by this permit. You must submit an application for an individual permit for your stormwater discharges. (See 40 CFR 122.21).

USFWS Effects Determination Guidance:

If you are unable to certify eligibility under USFWS Criterion A, you must assess whether your stormwater discharges and discharge-related activities “may affect”, will have “no affect” or are “not likely to adversely affect” listed species or critical habitat. “Discharge-related activities” include: activities which cause, contribute to, or result in point source stormwater pollutant discharges; and measures to provide treatment for stormwater discharges including the siting, construction and operational procedures to control, reduce or prevent water pollution. Please be aware that no protection from incidental take liability is provided under this criterion.

The scope of effects to consider will vary with each system. If you are having difficulty in determining whether your system is likely to cause adverse effects to a listed species or critical habitat, you should contact the USFWS for assistance. In order to complete the determination of effects it may be necessary to follow the formal or informal consultation procedures in section 7 of the ESA.

Upon completion of your assessment, document the results of your effects determination. If your results indicate that stormwater discharges or discharge related activities will have “no affect” on threatened or endangered species or critical habitat and EPA concurs with your determination, you are eligible under USFWS Criterion C of this Appendix. Your determination may be based on measures that you implement to avoid, eliminate, or minimized adverse effects.

If the determination is “May affect” or “not likely to adversely affect” you must contact the USFWS to discuss your findings and measures you could implement to avoid, eliminate, or minimize adverse effects. If you and the USFWS reach agreement on measures to avoid adverse effects, you are eligible under USFWS Criterion B. Any terms and/or conditions to protect listed species and critical habitat that you relied on in order to complete an adverse effects determination, must be incorporated into your Storm Water Management Program (required by this permit) and implemented in order to maintain permit eligibility.

If endangered species issues cannot be resolved: If you cannot reach agreement with the USFWS on measures to avoid or eliminate adverse effects then you are not eligible for coverage under this permit. You must seek coverage under an individual permit.

Effects from stormwater discharges and discharge-related activities which could pose an adverse effect include:

- *Hydrological:* Stormwater discharges may cause siltation, sedimentation, or induce other changes in receiving waters such as temperature, salinity or pH. These effects will vary with the amount of stormwater discharged and the volume and condition of the receiving water. Where a discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely.
- *Habitat:* Excavation, site development, grading and other surface disturbance activities, including the installation or placement of treatment equipment may adversely affect listed species or their habitat. Stormwater from the small MS4 may inundate a listed species habitat.

- *Toxicity*: In some cases, pollutants in the stormwater may have toxic effects on listed species.

Step 4 - Document Results of the Eligibility Determination

Once the USFWS ESA eligibility requirements have been met, you shall include documentation of USFWS ESA eligibility in the Storm Water Management Program required by the permit. Documentation for the various eligibility criteria are as follows:

- USFWS Criterion A: A copy of the IPaC generated preliminary determination letter indicating that no listed species or critical habitat is present within your action area. You shall also include a statement on how you determined that no listed species or critical habitat are in proximity to your stormwater system or discharges.
- USFWS Criterion B: A dated copy of the USFWS letter of concurrence on a finding of “no jeopardy” (for formal consultation) or “not likely to adversely affect” (for informal consultation) regarding the ESA section 7 consultation.
- USFWS Criterion C: A dated copy of the EPA concurrence with the operator’s determination that the stormwater discharges and discharge-related activities will have “no affect” on listed species or critical habitat.

C. Submittal of Notice of Intent

Once the ESA eligibility requirements of Part C of this Appendix have been met you may submit the Notice of Intent indicating which Criterion you have met to be eligible for permit coverage. Signature and submittal of the NOI constitutes your certification, under penalty of law, of eligibility for permit coverage under 40 CFR 122.21.

D. Duty to Implement Terms and Conditions upon which Eligibility was Determined

You must comply with any terms and conditions imposed under the ESA eligibility requirements to ensure that your stormwater discharges and discharge related activities do not pose adverse effects or jeopardy to listed species and/or critical habitat. You must incorporate such terms and conditions into your Storm Water Management Program as required by this permit. If the ESA eligibility requirements of this permit cannot be met, then you may not receive coverage under this permit and must apply for an individual permit.

E. Services Information

United States Fish and Wildlife Service Office

National websites for Endangered Species Information:
Endangered Species home page: <http://endangered.fws.gov>
ESA Section 7 Consultations: <http://endangered.fws.gov/consultation/index.html>
Information, Planning, and Conservation System (IPAC): <http://ecos.fws.gov/ipac/>

U.S. FWS – Region 5
Supervisor

New England Field Office
U.S. Fish and Wildlife Services
70 Commercial Street, Suite 300
Concord, NH 03301

Natural Heritage Network

The Natural Heritage Network comprises 75 independent heritage program organizations located in all 50 states, 10 Canadian provinces, and 12 countries and territories located throughout Latin America and the Caribbean. These programs gather, manage, and distribute detailed information about the biological diversity found within their jurisdictions. Developers, businesses, and public agencies use natural heritage information to comply with environmental laws and to improve the environmental sensitivity of economic development projects. Local governments use the information to aid in land use planning.

The Natural Heritage Network is overseen by NatureServe, the Network's parent organization, and is accessible on-line at: http://www.natureserve.org/nhp/us_programs.htm, which provides websites and other access to a large number of specific biodiversity centers.

U.S. Fish and Wildlife IPaC system instructions

Use the following protocol to determine if any federally listed species or designated critical habitats under USFWS jurisdiction exist in your action area:

Enter your project specific information into the “Initial Project Scoping” feature of the Information, Planning, and Conservation (IPaC) system mapping tool, which can be found at the following location:

<http://ecos.fws.gov/ipac/>

- a. Indicate the action area¹ for the MS4 by either:
 - a. Drawing the boundary on the map or by uploading a shapefile.
Select “Continue”

- c. Click on the “SEE RESOURCE LIST” button and on the next screen you can export a trust resources list. This will provide a list of natural resources of concern, which will include an Endangered Species Act Species list. You may also request an official species list under “REGULATORY DOCUMENTS” Save copies and retain for your records

¹ The action area is defined by regulation as all areas to be affected directly or indirectly by the action and not merely the immediate area involved in the action (50 CFR §402.02). This analysis is not limited to the "footprint" of the action nor is it limited by the Federal agency's authority. Rather, it is a biological determination of the reach of the proposed action on listed species. Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based upon the action area.

The documentation used by a Federal action agency to initiate consultation should contain a description of the action area as defined in the Services' regulations and explained in the Services' consultation handbook. If the Services determine that the action area as defined by the action agency is incorrect, the Services should discuss their rationale with the agency or applicant, as appropriate. Reaching agreement on the description of the action area is desirable but ultimately the Services can only consult when an action area is defined properly under the regulations.

For storm water discharges or discharge related activities, the action area should encompass the following:

- The immediate vicinity of, or nearby, the point of discharge into receiving waters.
- The path or immediate area through which or over which storm water flows from the municipality to the point of discharge into the receiving water. This includes areas in the receiving water downstream from the point of discharge.
- Areas that may be impacted by construction or repair activities. This extends as far as effects related to noise (from construction equipment, power tools, etc.) and light (if work is performed at night) may reach.

The action area will vary with the size and location of the outfall pipe, the nature and quantity of the storm water discharges, and the type of receiving waters, among other factors.

Attachment B
Danvers IPaC Trust Resources Report



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:

April 20, 2017

Consultation Code: 05E1NE00-2017-SLI-1379

Event Code: 05E1NE00-2017-E-02709

Project Name: Danvers Stormwater

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: 05E1NE00-2017-SLI-1379

Event Code: 05E1NE00-2017-E-02709

Project Name: Danvers Stormwater

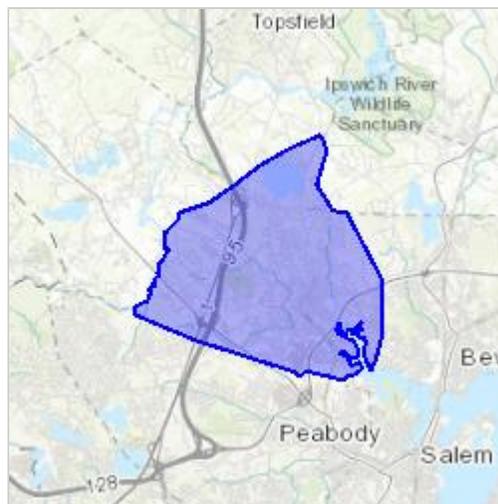
Project Type: Regulation Promulgation

Project Description: This is part of development of a Stormwater Master Plan, Town will be looking at several different projects Town-wide to improve stormwater management.

Project Location:

Approximate location of the project can be viewed in Google Maps:

<https://www.google.com/maps/place/42.57907418699628N70.95226601379946W>



Counties: Essex, MA

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on your 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. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Threatened
No critical habitat has been designated for this species.	
Species profile: https://ecos.fws.gov/ecp/species/9045	

Critical habitats

There are no critical habitats within your project area.

Attachment C
Federally Listed Endangered and Threatened Species in
Massachusetts

**FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN
MASSACHUSETTS**

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Barnstable	Piping Plover	Threatened	Coastal Beaches	All Towns
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Chatham
	Sandplain gerardia	Endangered	Open areas with sandy soils.	Sandwich and Falmouth.
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Bourne (north of the Cape Cod Canal)
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Berkshire	Bog Turtle	Threatened	Wetlands	Egremont and Sheffield
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Bristol	Piping Plover	Threatened	Coastal Beaches	Fairhaven, Dartmouth, Westport
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Fairhaven, New Bedford, Dartmouth, Westport
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Taunton
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Dukes	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Piping Plover	Threatened	Coastal Beaches	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Aquinnah and Chilmark
	Sandplain gerardia	Endangered	Open areas with sandy soils.	West Tisbury
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

Updated 02/05/2016

**FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES
IN MASSACHUSETTS**

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Essex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Gloucester, Essex and Manchester
	Piping Plover	Threatened	Coastal Beaches	Gloucester, Essex, Ipswich, Rowley, Revere, Newbury, Newburyport and Salisbury
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Franklin	Northeastern bulrush	Endangered	Wetlands	Montague, Warwick
	Dwarf wedgemussel	Endangered	Mill River	Whately
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Hampshire	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Hadley
	Puritan tiger beetle	Threatened	Sandy beaches along the Connecticut River	Northampton and Hadley
	Dwarf wedgemussel	Endangered	Rivers and Streams.	Hatfield, Amherst and Northampton
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Hampden	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Southwick
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Middlesex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Groton
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Nantucket	Piping Plover	Threatened	Coastal Beaches	Nantucket
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Nantucket
	American burying beetle	Endangered	Upland grassy meadows	Nantucket
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

**FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES
IN MASSACHUSETTS**

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Plymouth	Piping Plover	Threatened	Coastal Beaches	Scituate, Marshfield, Duxbury, Plymouth, Wareham and Mattapoisett
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Kingston, Middleborough, Carver, Plymouth, Bourne, Wareham, Halifax, and Pembroke
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Plymouth, Marion, Wareham, and Mattapoisett.
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Suffolk	Piping Plover	Threatened	Coastal Beaches	Revere, Winthrop
	Red Knot ¹	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Worcester	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Leominster
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

¹Migratory only, scattered along the coast in small numbers

-Eastern cougar and gray wolf are considered extirpated in Massachusetts.

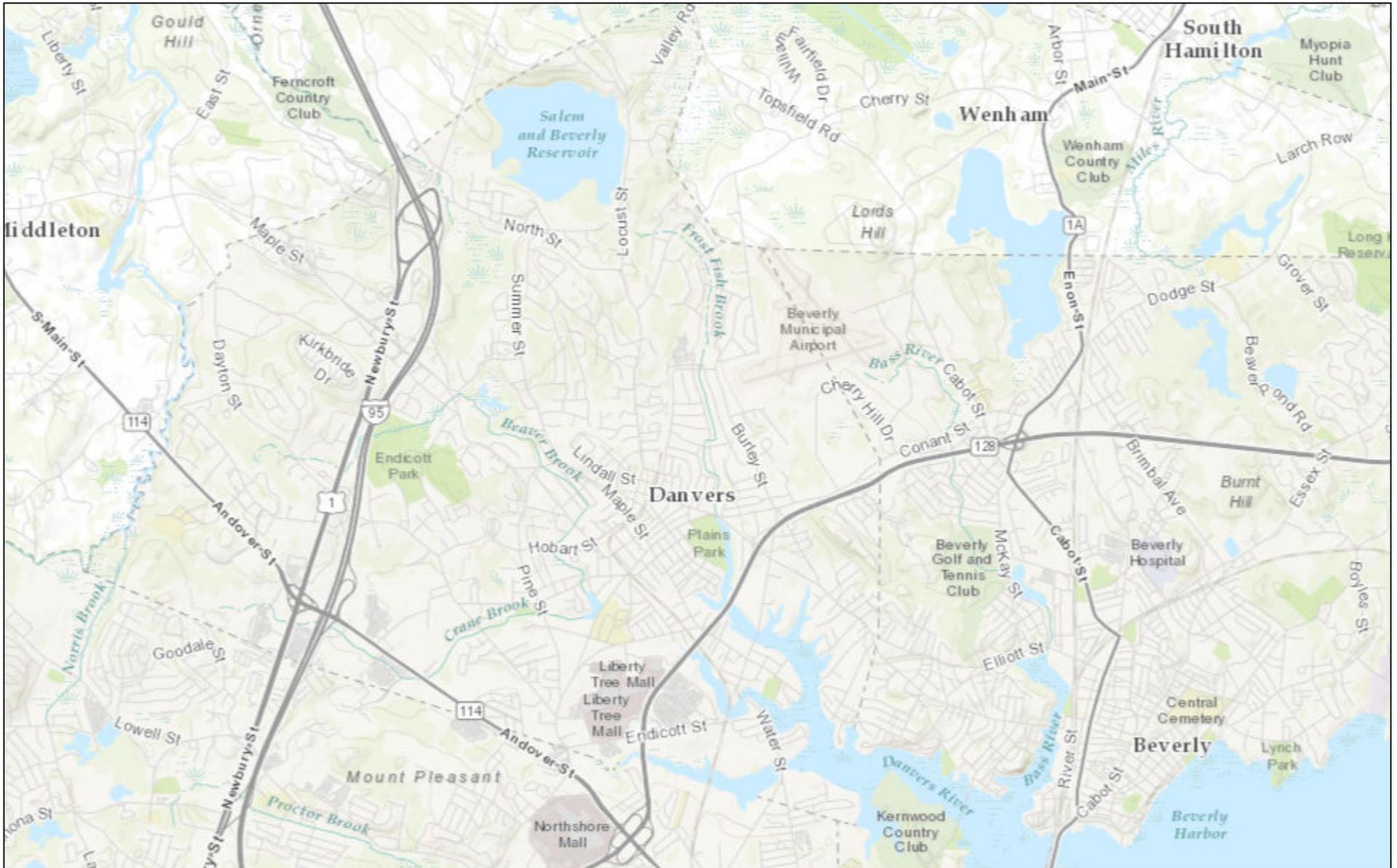
-Endangered gray wolves are not known to be present in Massachusetts, but dispersing individuals from source populations in Canada may occur statewide.

-Critical habitat for the Northern Red-bellied Cooter is present in Plymouth County.

Attachment D

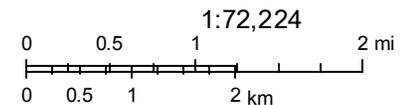
Northern Long-eared Bat Location Map

Northern Longeared bat Hibernacula & Maternity Roosts



April 20, 2017

- MA_NHESP_NLEB_Maternity_Roost_Tree_Locations
- MA_Northern_Long_eared_Bat_Winter_Hibernacula



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey,

Attachment E
U.S. Fish and Wildlife Review Letter



United States Department of the Interior



FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
<http://www.fws.gov/newengland>

January 20, 2017

To Whom It May Concern:

This project was reviewed for the presence of federally listed or proposed, threatened or endangered species or critical habitat per instructions provided on the U.S. Fish and Wildlife Service's New England Field Office website:

<http://www.fws.gov/newengland/EndangeredSpec-Consultation.htm> (accessed January 2017)

Based on information currently available to us, no federally listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under section 7 of the Endangered Species Act is not required. No further Endangered Species Act coordination is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Thank you for your cooperation. Please contact Maria Tur of this office at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Thomas R. Chapman
Supervisor
New England Field Office

Appendix D

Historic Properties Eligibility Criteria Documentation

National Historic Preservation Act Eligibility Certification

To: Town of Danvers Stormwater Management Program Files
FROM: Tighe & Bond
COPY: Stephen King, P.E., Town Engineer
DATE: November 28, 2018

Tighe & Bond has completed the National Historic Preservation Act Eligibility Determination screening process in accordance with Part 1.9.2 and Appendix D of U.S. EPA's National Pollutant Discharge Elimination System (NPDES) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) in Massachusetts (see Attachment A of this memorandum), effective July 1, 2018, and determined that the **Town of Danvers** meets **Criterion A**, where the discharges do not have the potential to cause effects on historic properties.

Tighe & Bond followed the screening process included in Appendix D and has determined Danvers is an existing facility authorized by the previous permit and therefore meets Criterion A (see Question 1 in Appendix D of the Permit) and is not, as part of developing and submitting the Notice of Intent for permit coverage, undertaking any activity involving subsurface land disturbance less than an acre.

Based on this screening process, the Town of Danvers's stormwater discharges, allowable non-stormwater discharges, and stormwater discharge-related activities will not have an effect on a property that is listed or eligible for listing on the National Register of Historic Properties (NRHP) and no further action is necessary at this time.

Attachment B to this memorandum includes a list of the federal- and state-listed historic areas, buildings, burial grounds, objects, and structures downloaded from the Massachusetts Cultural Resource Information System (MACRIS) that is current as of November 28, 2018. If the Town undertakes construction on or around a property that is listed or eligible for listing, the Town will coordinate with the State Historic Preservation Officer (SHPO) (i.e. the Massachusetts Historical Commission) by submitting a Project Notification Form and associated documentation for the project. As applicable for each project, the Town will implement measures to avoid or minimize adverse impacts on places listed, or eligible for listing, on the NRHP, including any conditions imposed by the SHPO or THPO. If the Town fails to document and implement such measures, those discharges are ineligible for coverage under EPA's Small MS4 General Permit.

Attachment A

Appendix D of U.S. EPA's National Pollutant Discharge Elimination System (NPDES) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) in Massachusetts

Appendix D National Historic Preservation Act Guidance

Background

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of Federal “undertakings” on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. The term federal “undertaking” is defined in the NHPA regulations to include a project, activity, or program of a federal agency including those carried out by or on behalf of a federal agency, those carried out with federal financial assistance, and those requiring a federal permit, license or approval. See 36 CFR 800.16(y). Historic properties are defined in the NHPA regulations to include prehistoric or historic districts, sites, buildings, structures, or objects that are included in, or are eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and remains that are related to and located within such properties. See 36 CFR 800.16(1).

EPA’s issuance of a National Pollutant Discharge Elimination System (NPDES) General Permit is a federal undertaking within the meaning of the NHPA regulations and EPA has determined that the activities to be carried out under the general permit require review and consideration, in order to be in compliance with the federal historic preservation laws and regulations. Although individual submissions for authorization under the general permit do not constitute separate federal undertakings, the screening processes provides an appropriate site-specific means of addressing historic property issues in connection with EPA’s issuance of the permit. To address any issues relating to historic properties in connection with the issuance of this permit, EPA has included a screening process for applicants to identify whether properties listed or eligible for listing on the National Register of Historic Places are within the path of their discharges or discharge-related activities (including treatment systems or any BMPs relating to the discharge or treatment process) covered by this permit.

Applicants seeking authorization under this general permit must comply with applicable, State, Tribal, and local laws concerning the protection of historic properties and places and may be required to coordinate with the State Historic Preservation Officer (SHPO) and/or Tribal Historic Preservation Officer (THPO) and others regarding effects of their discharges on historic properties.

Activities with No Potential to Have an Effect on Historic Properties

A determination that a federal undertaking has no potential to have an effect on historic properties fulfills an agency’s obligations under NHPA. EPA has reason to believe that the vast majority of activities authorized under this general permit will have no potential effects on historic properties. This permit typically authorizes discharges from existing facilities and requires control of the pollutants discharged from the facility. EPA does not anticipate effects on historic properties from the pollutants in the authorized discharges. Thus, to the extent EPA’s issuance of this general permit authorizes discharges of such constituents, confined to existing channels, outfalls or natural drainage areas, the permitting action does not have the potential to cause effects on historical properties.

In addition, the overwhelming majority of sources covered under this permit will be facilities that are seeking renewal of previous permit authorization. These existing dischargers should have already addressed NHPA issues in the previous general permit as they were required to certify that they were either not affecting historic properties or they had obtained written agreement from

the applicable SHPO or THPO regarding methods of mitigating potential impacts. To the extent this permit authorizes renewal of prior coverage without relevant changes in operations the discharge has no potential to have an effect on historic properties.

Activities with Potential to Have an Effect on Historic Properties

EPA believes this permit may have some potential to have an effect on historic properties the applicant undertakes the construction and/or installation of control measures that involve subsurface disturbance that involves less than 1 acre of land. (Ground disturbances of 1 acre or more require coverage under the Construction General Permit.) Where there is disturbance of land through the construction and/or installation of control measures, there is a possibility that artifacts, records, or remains associated with historic properties could be impacted. Therefore, if the applicant is establishing new or altering existing control measures to manage their discharge that will involve subsurface ground disturbance of less than 1 acre, they will need to ensure (1) that historic properties will not be impacted by their activities or (2) that they are in compliance with a written agreement with the SHPO, THPO, or other tribal representative that outlines all measures the applicant will carry out to mitigate or prevent any adverse effects on historic properties.

Examples of Control Measures Which Involve Subsurface Disturbance

The type of control measures that are presumptively expected to cause subsurface ground disturbance include:

- Dikes
- Berms
- Catch basins, drainage inlets
- Ponds, bioretention areas
- Ditches, trenches, channels, swales
- Culverts, pipes
- Land manipulation; contouring, sloping, and grading
- Perimeter Drains
- Installation of manufactured treatment devices

EPA cautions applicants that this list is non-inclusive. Other control measures that involve earth disturbing activities that are not on this list must also be examined for the potential to affect historic properties.

Certification

Upon completion of this screening process the applicant shall certify eligibility for this permit using one of the following criteria on their Notice of Intent for permit coverage:

Criterion A: The discharges do not have the potential to cause effects on historic properties.

Criterion B: A historic survey was conducted. The survey concluded that no historic properties are present. Discharges do not have the potential to cause effects on historic properties.

Criterion C: The discharges and discharge related activities have the potential to have an effect on historic properties, and the applicant has obtained and is in compliance with a written agreement with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (TPHO), or other tribal representative that outlines measures the applicant will carry out to mitigate or prevent any adverse effects on historic properties.

Authorization under the general permit is available only if the applicant certifies and documents permit eligibility using one of the eligibility criteria listed above. Small MS4s that cannot meet any of the eligibility criteria in above must apply for an individual permit.

Screening Process

Applicants or their consultant need to answer the questions and follow the appropriate procedures below to assist EPA in compliance with 36 CFR 800.

Question 1: Is the facility an existing facility authorized by the previous permit or a new facility and the applicant is not undertaking any activity involving subsurface land disturbance less than an acre?

YES - The applicant should certify that fact in writing and file the statement with the EPA. This certification must be maintained as part of the records associated with the permit.

The applicant should certify eligibility for this permit using Criterion A on their Notice of Intent for permit coverage. The applicant does not need to contact the state Historic Commission. Based on that statement, EPA will document that the project has “no potential to cause effects” (36 CFR 800.3(a)(1)). There are no further obligations under the Section 106 regulations.

NO- Go to Question 2.

Question 2: Is the property listed in the National Register of Historic Places or have prior surveys or disturbances revealed the existence of a historic property or artifacts?

NO - The applicant should certify that fact in writing and file the statement with the EPA. This certification must be maintained as part of the records associated with the permit.

The applicant should certify eligibility for this permit using Criterion B on their Notice of Intent for permit coverage. The applicant does not need to contact the state Historic Commission. Based on that statement, EPA will document that the project has “no potential to cause effects” (36 CFR 800.3(a)(1)). There are no further obligations under the Section 106 regulations.

YES - The applicant or their consultant should prepare a complete information submittal to the SHPO. The submittal consists of:

- Completed Project Notification Form- forms available at <http://www.sec.state.ma.us/mhc/mhcform/formidx.htm>;

- USGS map section with the actual project boundaries clearly indicated; and
- Scaled project plans showing existing and proposed conditions.

(1) Please note that the SHPO does not accept email for review. Please mail a paper copy of your submittal (Certified Mail, Return Receipt Requested) or deliver a paper copy of your submittal (and obtain a receipt) to:

State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Blvd.
Boston MA 02125.

(2) Provide a copy of your submittal and the proof of MHC delivery showing the date MHC received your submittal to:

NPDES Permit Branch Chief
US EPA Region 1 (OEP06-1)
5 Post Office Square, Suite 100
Boston MA 02109-3912.

The SHPO will comment within thirty (30) days of receipt of complete submittals, and may ask for additional information. Consultation, as appropriate, will include EPA, the SHPO and other consulting parties (which includes the applicant). The steps in the federal regulations (36 CFR 800.2 to 800.6, etc.) will proceed as necessary to conclude the Section 106 review for the undertaking. **The applicant should certify eligibility for this permit using Criterion C on their Notice of Intent for permit coverage.**

Attachment B

Massachusetts Cultural Resource Information System (MACRIS)
List of federal- and state-listed historic areas, buildings, burial
grounds, objects, and structures

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Danvers; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
DAN.A	Salem Village Historic District		Danvers	
DAN.B	State Lunatic Hospital at Danvers		Danvers	
DAN.C	First Period Buildings of Eastern Massachusetts		Danvers	
DAN.D	Danversport		Danvers	
DAN.E	Nike Missile Radar Fire Control Area B-05		Danvers	
DAN.F	Holten House		Danvers	
DAN.G	High Street Cemetery		Danvers	
DAN.H	Saint Alphonsus Roman Catholic Church Complex		Danvers	
DAN.I	Glen Magna Estate		Danvers	
DAN.271	Allen, Albert G. House	18 Alden St	Danvers	c 1892
DAN.925	Andover Street Railroad Bridge	Andover St	Danvers	1957
DAN.53	Swinerton, Amos Putnam House	308 Andover St	Danvers	c 1838
DAN.158	Hood, Joseph Edward House	4 Ash St	Danvers	c 1883
DAN.159	Shepard, Charles Horace House	8 Ash St	Danvers	c 1879
DAN.261	Welch, Jacob House	9 Ash St	Danvers	c 1853
DAN.260	Clough, Ira House	11 Ash St	Danvers	c 1856
DAN.160	Lawrence, Eliza - Coulthurst - Lord House	13 Ash St	Danvers	c 1870
DAN.161	Danforth, Joseph - Stetson, Alonzo J. House	17 Ash St	Danvers	c 1860
DAN.162	Couch, Lester S. House	20 Ash St	Danvers	1899
DAN.163	Parker, Gilman House	102 Ash St	Danvers	c 1838
DAN.267	Andrews, Judge Israel House	106 Ash St	Danvers	c 1843
DAN.164	Porter, John House	1 Bell St	Danvers	c 1745
DAN.270	Sanborn, Lewis W. House	20 Berry St	Danvers	1897
DAN.117	Damon, William T. House	25 Burley Ave	Danvers	c 1871
DAN.118	Hull - Fuller House	26 Burley Ave	Danvers	c 1872
DAN.119	Dickie, Thomas House	28 Burley Ave	Danvers	1914

Inv. No.	Property Name	Street	Town	Year
DAN.389	Burley Farm House	44 Burley Ave	Danvers	c 1793
DAN.806	Buxton - Goodale Cemetery	20 Buxton Ln	Danvers	1775
DAN.54	Goodale, William House	50 Buxton Ln	Danvers	c 1806
DAN.928	Railroad Bridge	Cabot Rd	Danvers	1900
DAN.1	Waitt House	2 Centre St	Danvers	c 1840
DAN.490		4 Centre St	Danvers	c 1840
DAN.489		9 Centre St	Danvers	c 1950
DAN.488		11 Centre St	Danvers	c 1840
DAN.487		14 Centre St	Danvers	c 1860
DAN.486		15 Centre St	Danvers	c 1840
DAN.3	Wilkins, James House	16 Centre St	Danvers	1847
DAN.485		17 Centre St	Danvers	c 1880
DAN.2	Putnam, Philemon House	18 Centre St	Danvers	1848
DAN.4	Houlton, Joseph House	19 Centre St	Danvers	1671
DAN.483		20 Centre St	Danvers	c 1930
DAN.482		22 Centre St	Danvers	c 1950
DAN.481		23 Centre St	Danvers	1860
DAN.480		25 Centre St	Danvers	c 1950
DAN.5	Houlten - Wilkins House	27 Centre St	Danvers	c 1692
DAN.479		28 Centre St	Danvers	c 1950
DAN.478		30 Centre St	Danvers	c 1840
DAN.477		31 Centre St	Danvers	c 1880
DAN.476		32 Centre St	Danvers	c 1840
DAN.475		33 Centre St	Danvers	c 1930
DAN.474		34 Centre St	Danvers	c 1840
DAN.6	Haines, Thomas House	35 Centre St	Danvers	1681
DAN.473		36 Centre St	Danvers	c 1950
DAN.472		38 Centre St	Danvers	c 1950
DAN.7	Tapley, Rufus House	39 Centre St	Danvers	c 1812
DAN.471		40 Centre St	Danvers	c 1880
DAN.916	First Congregational Church Marker	41 Centre St	Danvers	1891
DAN.470		42 Centre St	Danvers	c 1860
DAN.469		44 Centre St	Danvers	c 1900
DAN.466		50 Centre St	Danvers	c 1880
DAN.8	Kenney House	52 Centre St	Danvers	c 1748
DAN.465	First Church Parsonage	53 Centre St	Danvers	1950
DAN.9	Wheelwright House	55 Centre St	Danvers	1848
DAN.464		56 Centre St	Danvers	c 1880

Inv. No.	Property Name	Street	Town	Year
DAN.10	Morrison House	59 Centre St	Danvers	c 1852
DAN.463		60 Centre St	Danvers	c 1930
DAN.11	Cross, Peter Jr. House	61 Centre St	Danvers	1841
DAN.462		62 Centre St	Danvers	c 1851
DAN.461		63 Centre St	Danvers	c 1840
DAN.460		64 Centre St	Danvers	c 1840
DAN.12	Roberts, John House	65 Centre St	Danvers	1839
DAN.459		66 Centre St	Danvers	c 1860
DAN.458		67 Centre St	Danvers	1852
DAN.903	Parsonage Foundation Site	67 Centre St	Danvers	c 1776
DAN.457		68 Centre St	Danvers	c 1840
DAN.14	Wilkins, William A. House	69 Centre St	Danvers	1850
DAN.456		70 Centre St	Danvers	c 1840
DAN.455		71 Centre St	Danvers	c 1840
DAN.15	Wadsworth House	73 Centre St	Danvers	1785
DAN.16	Lincoln House	74 Centre St	Danvers	1852
DAN.17	Prentiss House	77 Centre St	Danvers	c 1853
DAN.18	Legro, Samuel House	78 Centre St	Danvers	1854
DAN.450		82 Centre St	Danvers	1950
DAN.19	Prince, Amos Jr. House	83 Centre St	Danvers	1850
DAN.904	Training Field Boulder	85 Centre St	Danvers	1894
DAN.20	Prince, Moses House	86 Centre St	Danvers	1839
DAN.21	Prince - Goodale House	90 Centre St	Danvers	c 1850
DAN.447		94 Centre St	Danvers	c 1900
DAN.22	Upton Tavern	95 Centre St	Danvers	c 1710
DAN.446		96 Centre St	Danvers	c 1860
DAN.445		99 Centre St	Danvers	c 1878
DAN.444		100 Centre St	Danvers	c 1840
DAN.443		101 Centre St	Danvers	c 1878
DAN.23	Smith, John House	102 Centre St	Danvers	c 1850
DAN.442		105 Centre St	Danvers	
DAN.24	Smith - Nason - Carleton House	106 Centre St	Danvers	1852
DAN.441		107 Centre St	Danvers	c 1900
DAN.25	Mudge, Edwin House	108 Centre St	Danvers	1852
DAN.439		110 Centre St	Danvers	1850
DAN.440		111 Centre St	Danvers	c 1900
DAN.438		112 Centre St	Danvers	1875
DAN.26	Mudge, Josiah House	113 Centre St	Danvers	1844

Inv. No.	Property Name	Street	Town	Year
DAN.27	Swinerton House	115 Centre St	Danvers	c 1852
DAN.62	Wadsworth School	130 Centre St	Danvers	1897
DAN.55	Hutchinson, Elisha House	182 Centre St	Danvers	c 1726
DAN.56	Mudge - Pratt House	191 Centre St	Danvers	c 1806
DAN.57	Tapley, Amos House	208 Centre St	Danvers	c 1783
DAN.165	Aiken, Charles Frederick House	5 Charles St	Danvers	c 1883
DAN.166	Traveling House, The - Bell, George House	3 Charter St	Danvers	c 1893
DAN.167	Putnam, Simeon - Bell, John House	5 Charter St	Danvers	c 1847
DAN.582		6 Cheever St	Danvers	r 1880
DAN.583		8 Cheever St	Danvers	r 1880
DAN.584		9 Cheever St	Danvers	r 1880
DAN.585		11 Cheever St	Danvers	r 1920
DAN.586		13 Cheever St	Danvers	r 1920
DAN.587		15 Cheever St	Danvers	c 1900
DAN.588		17 Cheever St	Danvers	c 1900
DAN.589		19 Cheever St	Danvers	c 1900
DAN.590		21 Cheever St	Danvers	c 1900
DAN.168	Putnam, Simeon - Spaulding - Webber House	5 Cherry St	Danvers	c 1835
DAN.169	Spofford, Frank M. House	8 Cherry St	Danvers	1892
DAN.170	Putnam, Moses - Fletcher - Fowler House	12 Cherry St	Danvers	c 1844
DAN.171	Putnam, Capt. Andrew Merriam House	15 Cherry St	Danvers	c 1844
DAN.172	Porter, J. Frank House	19 Cherry St	Danvers	c 1877
DAN.173	Newhall, Benjamin E. House	21 Cherry St	Danvers	1864
DAN.174	Ropes, Joseph White House	25 Cherry St	Danvers	c 1843
DAN.259	Danvers Plains Train Station	29 Cherry St	Danvers	1868
DAN.255	Smith, Michael House	34 Cherry St	Danvers	c 1857
DAN.256	Calvary Episcopal Church Rectory	44 Cherry St	Danvers	1890
DAN.802	Endicott - Russell Cemetery	25 Clinton Ave	Danvers	1758
DAN.491		1 Collins St	Danvers	c 1880
DAN.492		3 Collins St	Danvers	
DAN.493		5 Collins St	Danvers	c 1840
DAN.494		7 Collins St	Danvers	c 1880
DAN.495		9 Collins St	Danvers	c 1950
DAN.496		10 Collins St	Danvers	c 1880
DAN.497		11 Collins St	Danvers	c 1950
DAN.498		12 Collins St	Danvers	c 1950
DAN.500		13 Collins St	Danvers	
DAN.499		14 Collins St	Danvers	c 1930

Inv. No.	Property Name	Street	Town	Year
DAN.28	Cross House - Danvers District #6 Schoolhouse	16 Collins St	Danvers	1795
DAN.58	Tapley, Jesse House	86 Collins St	Danvers	c 1828
DAN.175	Danvers Savings Bank	1 Conant St	Danvers	1923
DAN.934	Arnold, Benedict Monument	1 Conant St	Danvers	1912
DAN.258	Richard's Store	7 Conant St	Danvers	c 1841
DAN.403	U. S. Post Office - Danvers Branch	17 Conant St	Danvers	c 1935
DAN.176	White, Dr. Charles Henry House	19 Conant St	Danvers	c 1884
DAN.177	Saint Mary of the Annunciation Catholic Church	24 Conant St	Danvers	1937
DAN.178	Baldwin, Dr. William Frederick House	25 Conant St	Danvers	c 1901
DAN.252	Trask, Alfred House	30 Conant St	Danvers	c 1839
DAN.253	Holten High School	55 Conant St	Danvers	r 1930
DAN.254	Richmond Junior High School	55 Conant St	Danvers	c 1926
DAN.405	Jewett, John S. House	83 Conant St	Danvers	c 1874
DAN.179	Rea - Proctor Homestead	180 Conant St	Danvers	c 1692
DAN.927	Crane River Railroad Bridge	Crane River	Danvers	c 1882
DAN.964	Crane River Stone Retaining Walls	Crane River	Danvers	
DAN.965	Creese and Cook Footbridge	Crane River	Danvers	c 1909
DAN.59	Upton, Alexander House	71 Dayton St	Danvers	c 1851
DAN.929	Donegal Lane Extension Railroad Bridge	Donegal Ln Ext	Danvers	1900
DAN.120	Boyson - Hartman House	12 East St	Danvers	c 1868
DAN.104	Rea - Putnam - Fowler House	4 Elerton Ln	Danvers	c 1700
DAN.801	Leech Cemetery	128 Elliot St	Danvers	1774
DAN.390	Williams, Mildred Elementary School	105 Elliott St	Danvers	1916
DAN.391	Putnam, Rufus House	156 Elliott St	Danvers	c 1809
DAN.581	Saint Alphonsus Roman Catholic Church	188 Elliott St	Danvers	1968
DAN.180	Fossa Block	11 Elm St	Danvers	1915
DAN.273	Warren, Jonas - Richards, Daniel Barn	16 Elm St	Danvers	c 1803
DAN.181	Richards, Daniel House	28 Elm St	Danvers	c 1842
DAN.182	Page, John - Merrill - Spaulding House	29 Elm St	Danvers	c 1836
DAN.183	Stimpson, George O. - Deering, Dr. Charles House	38 Elm St	Danvers	c 1894
DAN.185	Fellows, Alfred - Masury, Charles House	48 Elm St	Danvers	1845
DAN.186	Porter - Putnam - Berry - Henderson House	63 Elm St	Danvers	c 1745
DAN.187	Grosvenor, David A. - Niles, Edward H. House	66 Elm St	Danvers	1848
DAN.188	Merrill, Levi House	69 Elm St	Danvers	c 1849
DAN.189	Smart, John L. House	74 Elm St	Danvers	c 1853
DAN.190	Felton, James House	84 Elm St	Danvers	c 1839
DAN.924	Endicott Street Bridge over Route 128	Endicott St	Danvers	1954

Inv. No.	Property Name	Street	Town	Year
DAN.370	Ferguson, George House	6 Endicott St	Danvers	c 1893
DAN.339	Kelley, Augustus C. House	8 Endicott St	Danvers	c 1890
DAN.340	Pindar, Samuel House	9 Endicott St	Danvers	c 1802
DAN.341	Lumms, John House	10 Endicott St	Danvers	c 1897
DAN.342	Dunnels, Walter Channing House	14 Endicott St	Danvers	c 1889
DAN.343	Dunnels, Lorenzo House	16 Endicott St	Danvers	c 1891
DAN.344	Boyce, Henry House	17 Endicott St	Danvers	c 1888
DAN.345	Whittier, Clarence S. House	18 Endicott St	Danvers	c 1891
DAN.346	Tibbetts, William F. House	19 Endicott St	Danvers	c 1880
DAN.347	Budgell, Walter House	21 Endicott St	Danvers	c 1870
DAN.348	Morse, George M. House	22 Endicott St	Danvers	c 1888
DAN.349	Pope, Fletcher House	24 Endicott St	Danvers	c 1891
DAN.350	Pope, Fletcher House	26 Endicott St	Danvers	c 1891
DAN.351	Spear, William House	41 Endicott St	Danvers	c 1893
DAN.352	Forbes, Gardner House	51 Endicott St	Danvers	c 1950
DAN.353	Gallivan, Patrick H. House	55 Endicott St	Danvers	c 1915
DAN.316	Sprague House	59 Endicott St	Danvers	c 1810
DAN.317	Porter, Isaac House	63 Endicott St	Danvers	c 1846
DAN.191	Whittier, Clarence S. House	11 Essex St	Danvers	1914
DAN.192	Cressey, Enoch Thurston House	13 Essex St	Danvers	c 1858
DAN.193	Wesleyen Society Chapel	15 Essex St	Danvers	c 1847
DAN.194	Hayward, Evi House	17 Essex St	Danvers	c 1855
DAN.195	Leavitt, Ruth Maria House	18 Essex St	Danvers	c 1872
DAN.196	Hills, Nathaniel House	19 Essex St	Danvers	1861
DAN.121	Kennison - Dodge House	3 Fellows St	Danvers	c 1872
DAN.135	Philbrook, David House	9 Fellows St	Danvers	c 1872
DAN.134	Fowle, William House	13 Fellows St	Danvers	c 1872
DAN.31	Hutchinson - Jocelyn House	84 Forest St	Danvers	c 1700
DAN.437		123 Forest St	Danvers	c 1950
DAN.811	Swinerton Cemetery	38A Garden St	Danvers	1813
DAN.592	Putnam, Calvin Lumber Company - Pope's Lumber Yard	8 Harbor St	Danvers	r 1880
DAN.591	Putnam, C. House	9 Harbor St	Danvers	c 1870
DAN.318	Story, Ira House	11 Harbor St	Danvers	1857
DAN.593		30 Harbor St	Danvers	r 1920
DAN.594	Porter, Luther House	34 Harbor St	Danvers	1893
DAN.595		5 Hardy St	Danvers	c 1890
DAN.596	Hammond, W. House	6 Hardy St	Danvers	c 1870

Inv. No.	Property Name	Street	Town	Year
DAN.597		7 Hardy St	Danvers	c 1890
DAN.598		9 Hardy St	Danvers	c 1890
DAN.599	Stickney, Charles T. House	11 Hardy St	Danvers	c 1885
DAN.600		16 Hardy St	Danvers	c 1900
DAN.601		18 Hardy St	Danvers	c 1900
DAN.525	State Lunatic Hospital - Cottage #10	4 Hathorne Ave	Danvers	1932
DAN.526	State Lunatic Hospital - Cottage #2	5 Hathorne Ave	Danvers	1909
DAN.524	State Lunatic Hospital - Cottage #3	10 Hathorne Ave	Danvers	1882
DAN.197	Danvers Masonic Temple	30 High St	Danvers	c 1858
DAN.809	High Street Cemetery	45 High St	Danvers	1758
DAN.941	High Street Cemetery Perimeter Walls	45 High St	Danvers	
DAN.942	High Street Cemetery Vehicular Entrance Gate	45 High St	Danvers	1843
DAN.943	High Street Cemetery Pedestrian Entry	45 High St	Danvers	
DAN.944	High Street Cemetery Historic Marker	45 High St	Danvers	
DAN.945	High Street Cemetery - World War I Field Cannon	45 High St	Danvers	c 1917
DAN.946	High Street Cemetery - Porter Plot Perimeter Wall	45 High St	Danvers	c 1836
DAN.947	High Street Cemetery - Porter Plot Steps	45 High St	Danvers	c 1836
DAN.948	High Street Cemetery - Porter Plot Obelisk	45 High St	Danvers	c 1836
DAN.949	High Street Cemetery - Porter Plot Gravemarkers	45 High St	Danvers	c 1836
DAN.950	High Street Cemetery - Porter Plot Foot Stones	45 High St	Danvers	c 1836
DAN.951	High Street Cemetery - Stearns Plot Fence Bases	45 High St	Danvers	c 1858
DAN.952	High Street Cemetery - Stearns Plot Gravemarker	45 High St	Danvers	c 1858
DAN.953	High Street Cemetery - Marcy, Curtis Memorial	45 High St	Danvers	
DAN.954	High Street Cemetery - Dwinnell Monument	45 High St	Danvers	
DAN.955	High Street Cemetery - Boileau, William Marker	45 High St	Danvers	
DAN.956	High Street Cemetery - Batchelder, Ezra Marker	45 High St	Danvers	c 1809
DAN.957	High Street Cemetery - Pierce, Jonathan Marker	45 High St	Danvers	c 1796
DAN.958	High Street Cemetery - Chaplin, Mary D. Marker	45 High St	Danvers	c 1813
DAN.959	High Street Cemetery - O'Brien, Marcia Marker	45 High St	Danvers	c 1816
DAN.960	High Street Cemetery - Green, Lydia Marker	45 High St	Danvers	c 1792
DAN.961	High Street Cemetery - Page, Samuel Marker	45 High St	Danvers	c 1794
DAN.962	High Street Cemetery - Page, Jeremiah Marker	45 High St	Danvers	c 1806
DAN.963	High Street Cemetery - Page, Susannah Marker	45 High St	Danvers	c 1855
DAN.336	Danvers Baptist Church Parsonage	106 High St	Danvers	c 1843
DAN.539	Danversport Engine Company #3	130 High St	Danvers	c 1925

Inv. No.	Property Name	Street	Town	Year
DAN.354	Stickney, Charles T. House	132 High St	Danvers	1868
DAN.540	Goodrich, Samuel House	133 High St	Danvers	1851
DAN.541	Hardy, Daniel House	134 High St	Danvers	1831
DAN.542	Pope, Jesper House	135 High St	Danvers	1833
DAN.546	Kobierski, John House	136 High St	Danvers	1960
DAN.373	Black, James D. - Merrill, Joseph House	137 High St	Danvers	1825
DAN.543	Dunnels, Susan House	138R High St	Danvers	1910
DAN.544	Dunnels, Lorenzo P. Business Office	138 High St	Danvers	1880
DAN.355	Sullivan, John C. House	139R High St	Danvers	1916
DAN.547	Cobb, John B. House	139 High St	Danvers	1833
DAN.548	Mozejko, Cleophas House	140 High St	Danvers	1966
DAN.549	Chaplin, Charles House	141 High St	Danvers	1852
DAN.550	Porter, Joseph House	142 High St	Danvers	1830
DAN.551	Porter, Dea. Abijah New House	142 1/2 High St	Danvers	1846
DAN.356	Hood, William Orvin House	143 High St	Danvers	1880
DAN.552	Porter, Dea. Abijah House	144 High St	Danvers	1836
DAN.553	Porter, George House	145 High St	Danvers	1842
DAN.554	Kerans, Joseph M. House	146 High St	Danvers	1889
DAN.555	Perry, Jacob F. House	147 High St	Danvers	1833
DAN.556	Kerans, Charles Patrick House	148 High St	Danvers	1889
DAN.357	Warren, Aaron W. House	149 High St	Danvers	1860
DAN.557	Kerans, Charles H. House	150 High St	Danvers	1914
DAN.558	Warren, Aaron Carriage House	151 High St	Danvers	1860
DAN.559	Rowell, Enoch House	152 High St	Danvers	1869
DAN.560	Kerans, Charles P. House	152A High St	Danvers	1883
DAN.561	Fowler, Samuel Page - Jacobs, W. House	154 High St	Danvers	1849
DAN.562	Fowler, Samuel Page - George, John D. House	156 High St	Danvers	1844
DAN.563	Eveleth, Aaron House	157 High St	Danvers	1847
DAN.564	Fowler, Samuel Page House	158 High St	Danvers	1839
DAN.358	Fowler, Augustus - Cook, George C. House	160 High St	Danvers	1839
DAN.565	Fowler, Henry House	162 High St	Danvers	1842
DAN.52	Fowler House	166 High St	Danvers	1810
DAN.566	Goodrich, William House	2 High Street Ct	Danvers	1845
DAN.567	Corning, Phineas House	4 High Street Ct	Danvers	1850
DAN.269	Lander Barracks	20 Hilaire Ave	Danvers	c 1862
DAN.909	1672 Church Site	Hobart St	Danvers	c 1672
DAN.421		156 Hobart St	Danvers	c 1880
DAN.420		157 Hobart St	Danvers	c 1950

Inv. No.	Property Name	Street	Town	Year
DAN.422		158 Hobart St	Danvers	c 1880
DAN.423		160 Hobart St	Danvers	
DAN.424		162 Hobart St	Danvers	c 1860
DAN.425		164 Hobart St	Danvers	c 1880
DAN.32	Clark House	165 Hobart St	Danvers	1727
DAN.426		166 Hobart St	Danvers	c 1880
DAN.430		167 Hobart St	Danvers	c 1950
DAN.427		168 Hobart St	Danvers	c 1880
DAN.428		170 Hobart St	Danvers	c 1880
DAN.33	Hook, Hiram House	171 Hobart St	Danvers	c 1775
DAN.431		173 Hobart St	Danvers	c 1950
DAN.432		175 Hobart St	Danvers	c 1950
DAN.429		176 Hobart St	Danvers	
DAN.34	Darling - Prince House	177 Hobart St	Danvers	c 1680
DAN.433		180 Hobart St	Danvers	c 1930
DAN.434		181 Hobart St	Danvers	c 1950
DAN.435		183 Hobart St	Danvers	c 1850
DAN.468		185 Hobart St	Danvers	c 1950
DAN.436		190 Hobart St	Danvers	
DAN.35	Ingersoll House	199 Hobart St	Danvers	c 1670
DAN.275	Buckley, George B. - Eaton, Everett E. House	5 Holten St	Danvers	c 1872
DAN.276	Legro, Samuel Otis - Ingalls, Charles N. House	7 Holten St	Danvers	c 1853
DAN.277	Rowley, William - Batson, Nathaniel House	9 Holten St	Danvers	c 1852
DAN.278	Kenney, William Johnson Curtis House	14 Holten St	Danvers	1855
DAN.279	Getchell, Ephraim House	17 Holten St	Danvers	c 1853
DAN.280	Perkins, Henry Augustus - Day, Arthur E. House	18 Holten St	Danvers	c 1869
DAN.281	Southwick, Lewis House	21 Holten St	Danvers	c 1868
DAN.282	Tapley, Herbert Sprague House	23 Holten St	Danvers	1886
DAN.283	Putnam, Rev. James Wellington House	27 Holten St	Danvers	1860
DAN.284	Massey, Lucretia D. - George - Sullivan House	28 Holten St	Danvers	1892
DAN.285	Fuller, Nehemiah Putnam House	64 Holten St	Danvers	c 1855
DAN.286	Cook, David House	68 Holten St	Danvers	c 1853
DAN.287	Gregg, Thomas House	70 Holten St	Danvers	1855
DAN.288	Hawkes, Timothy House	72 Holten St	Danvers	1855
DAN.289	Fulton, Hugh - Mains, James House	74 Holten St	Danvers	c 1854
DAN.290	Woodman, Wyatt B. House	83 Holten St	Danvers	1844
DAN.291	Tapley, Perley House	91 Holten St	Danvers	c 1825
DAN.292	Tapleyville School	95 Holten St	Danvers	1896

Inv. No.	Property Name	Street	Town	Year
DAN.293	Welch, Moses House	113 Holten St	Danvers	1855
DAN.294	Dodge, Sylvanus House	119 Holten St	Danvers	c 1830
DAN.295	Dodge, Sylvanus House	121 Holten St	Danvers	c 1830
DAN.296	Robotham, William - Kelley, Martin House	130 Holten St	Danvers	c 1854
DAN.800	Holten Street Cemetery	131 Holten St	Danvers	1789
DAN.297	Smith, James House	132 Holten St	Danvers	c 1854
DAN.298	Tapley, George House	138 Holten St	Danvers	c 1865
DAN.299	Green, William House	139 Holten St	Danvers	c 1858
DAN.300	Snow - Wentworth House	141 Holten St	Danvers	c 1855
DAN.301	Martin, George B. - Rundlett, Charles H. House	142 Holten St	Danvers	c 1853
DAN.302	Chapman, Jeremiah - Martin - French House	147 Holten St	Danvers	c 1850
DAN.303	French, Isaac P. House	150 Holten St	Danvers	c 1850
DAN.304	Hawkes, Thorndike House	153 Holten St	Danvers	c 1885
DAN.36	Holten, Benjamin House	171 Holten St	Danvers	1670
DAN.37	Holten Double Privy	171 Holten St	Danvers	c 1823
DAN.933	Revolutionary War Memorial Fountain	171 Holten St	Danvers	1915
DAN.449		1 Ingersoll Pkwy	Danvers	c 1930
DAN.448		3 Ingersoll Pkwy	Danvers	c 1930
DAN.915	Pound Site	5 Ingersoll St	Danvers	
DAN.918	Revolutionary War Memorial	5 Ingersoll St	Danvers	1976
DAN.38	Peabody, William House	7 Ingersoll St	Danvers	1852
DAN.537	Peabody, William Garage	7 Ingersoll St	Danvers	c 1852
DAN.39	Prince, Amos Sr. House	8 Ingersoll St	Danvers	1809
DAN.452		11 Ingersoll St	Danvers	1950
DAN.451		15 Ingersoll St	Danvers	1950
DAN.407	Magna, Glen Carriage House	21 Ingersoll St	Danvers	
DAN.408	Magna, Glen Washhouse	21 Ingersoll St	Danvers	
DAN.409	Magna, Glen Cow Barn	21 Ingersoll St	Danvers	
DAN.410	Magna, Glen Hay Barn	21 Ingersoll St	Danvers	
DAN.412	Magna, Glen Bull Barn	21 Ingersoll St	Danvers	
DAN.914	Magna, Glen Corn Crib	21 Ingersoll St	Danvers	
DAN.29	Derby Summer House	29 Ingersoll St	Danvers	1792
DAN.30	Glen Magna Mansion	29 Ingersoll St	Danvers	c 1790
DAN.413	Glen Magna Estate - Caretaker House	29 Ingersoll St	Danvers	
DAN.414	Glen Magna Estate - Greenhouse	29 Ingersoll St	Danvers	c 1930
DAN.630	Glen Magna Estate - Greenhouse	29 Ingersoll St	Danvers	
DAN.631	Glen Magna Estate - Tool Shed	29 Ingersoll St	Danvers	
DAN.906	Glen Magna Estate - Rose Garden	29 Ingersoll St	Danvers	

Inv. No.	Property Name	Street	Town	Year
DAN.907	Glen Magna Estate - Landscape	29 Ingersoll St	Danvers	
DAN.908	Glen Magna Estate - Circular Drive	29 Ingersoll St	Danvers	
DAN.939	Glen Magna Estate - The Reaper and Milkmaid Statues	29 Ingersoll St	Danvers	c 1924
DAN.967	Glen Magna Estate - Barn Road	29 Ingersoll St	Danvers	
DAN.968	Glen Magna Estate - Osborne Gate	29 Ingersoll St	Danvers	
DAN.969	Glen Magna Estate - Old Fashioned Garden	29 Ingersoll St	Danvers	
DAN.970	Glen Magna Estate - Flower Garden	29 Ingersoll St	Danvers	
DAN.971	Glen Magna Estate - Raspberry Patch	29 Ingersoll St	Danvers	
DAN.972	Glen Magna Estate - Peabody Gazebo	29 Ingersoll St	Danvers	
DAN.973	Glen Magna Estate - Carriage Road	29 Ingersoll St	Danvers	
DAN.974	Glen Magna Estate - Lover's Walk	29 Ingersoll St	Danvers	
DAN.975	Glen Magna Estate - Cushing Pergola	29 Ingersoll St	Danvers	
DAN.976	Glen Magna Estate - Shrubbery Garden	29 Ingersoll St	Danvers	
DAN.977	Glen Magna Estate - Meadow's Gate - Willow's Gate	29 Ingersoll St	Danvers	
DAN.978	Glen Magna Estate - Mary's Garden	29 Ingersoll St	Danvers	
DAN.979	Glen Magna Estate - Decorative Metal Entry Gate	29 Ingersoll St	Danvers	
DAN.980	Glen Magna Estate - Wall System	29 Ingersoll St	Danvers	
DAN.981	Glen Magna Estate - Oak Tree Allee	29 Ingersoll St	Danvers	
DAN.982	Glen Magna Estate - Endicott Bench and Fountain	29 Ingersoll St	Danvers	
DAN.983	Glen Magna Estate - Rose Garden Statues	29 Ingersoll St	Danvers	
DAN.984	Glen Magna Estate - Rose Garden Fountains	29 Ingersoll St	Danvers	
DAN.985	Glen Magna Estate - Mary's Garden Fountain	29 Ingersoll St	Danvers	
DAN.530	State Lunatic Hospital - Cottage #4	1 Kirkbride Dr	Danvers	c 1850
DAN.532	State Lunatic Hospital - New Laundry	15 Kirkbride Dr	Danvers	c 1965
DAN.533	State Lunatic Hospital - Tractor Shed	15 Kirkbride Dr	Danvers	c 1955
DAN.534	State Lunatic Hospital - Farm Garage	15 Kirkbride Dr	Danvers	1955
DAN.535	State Lunatic Hospital - Implement Shed	15 Kirkbride Dr	Danvers	c 1955
DAN.536	State Lunatic Hospital - Hay Barn	15 Kirkbride Dr	Danvers	1951
DAN.68	Danvers State Hospital	50 Kirkbride Dr	Danvers	r 1875
DAN.79	State Lunatic Hospital - Gray Gables	50 Kirkbride Dr	Danvers	1898
DAN.910	State Lunatic Hospital - Stairway	50 Kirkbride Dr	Danvers	c 1900
DAN.911	State Lunatic Hospital - Water Tower	50 Kirkbride Dr	Danvers	c 1960
DAN.523	State Lunatic Hospital - Cottage #6	15 Kirkbridge Dr	Danvers	1894
DAN.392	Woodbury, Joshua P. House	30 Liberty St	Danvers	c 1857
DAN.393	Norton, Henry Merrill House	46 Liberty St	Danvers	c 1846

Inv. No.	Property Name	Street	Town	Year
DAN.331	Chaplin House	57 Liberty St	Danvers	c 1850
DAN.374		59 Liberty St	Danvers	c 1951
DAN.394	Gray, Josiah House	60 Liberty St	Danvers	c 1855
DAN.375	Mason, Frederick C. House	61 Liberty St	Danvers	c 1948
DAN.395	Ross, John House	64 Liberty St	Danvers	c 1856
DAN.376		66 Liberty St	Danvers	c 1961
DAN.377	Staples, Hiram C. - Standley, Charles S. House	67 Liberty St	Danvers	c 1881
DAN.332	Webb, William House	69 Liberty St	Danvers	c 1854
DAN.378	Cary, William E. House	70 Liberty St	Danvers	c 1868
DAN.379	Cary, William E. House	70 1/2 Liberty St	Danvers	c 1868
DAN.380	Day, Stephen S. House	72 Liberty St	Danvers	c 1868
DAN.333	Porter, Samuel House	73 Liberty St	Danvers	1855
DAN.381	Bouras, Charles J. House	75 Liberty St	Danvers	c 1937
DAN.396	Withey, John House	78 Liberty St	Danvers	c 1856
DAN.382	Day, George H. House	81 Liberty St	Danvers	c 1830
DAN.397	Gray, Josiah House	82 Liberty St	Danvers	c 1856
DAN.383	Day, George H. House	83 Liberty St	Danvers	c 1887
DAN.384	Day, George H. House	85 Liberty St	Danvers	c 1867
DAN.398	Gray, Josiah House	86 Liberty St	Danvers	c 1857
DAN.399	Carr, Edward House	89 Liberty St	Danvers	c 1898
DAN.400	Dickey, William G. House	94 Liberty St	Danvers	c 1874
DAN.334	Bowen, Francis House	111 Liberty St	Danvers	c 1860
DAN.568	Kerans Leather Company	123 Liberty St	Danvers	1906
DAN.401	Chaplin, Jeremiah House	130 Liberty St	Danvers	1800
DAN.402	Kent, Benjamin - Fowler, Henry House	132 Liberty St	Danvers	1800
DAN.122	Tedford, Samuel House	57 Lindall St	Danvers	c 1871
DAN.123	Learoyd, John S. House	59 Lindall St	Danvers	c 1872
DAN.124	Townsend - Rice House	61 Lindall St	Danvers	c 1871
DAN.936	Flame of Hope Sculpture	75 Lindall St	Danvers	1985
DAN.81	Sheldon, Warren - Ropes, Joseph House	19 Locust St	Danvers	c 1836
DAN.82	Andrews, Winthrop House	21 Locust St	Danvers	1844
DAN.144	Wiggins, Sarah - Patch, Benjamin F. House	23 Locust St	Danvers	c 1850
DAN.145	Batchelder, Henry T. House	25 Locust St	Danvers	c 1899
DAN.83	Joy, Samuel - Chase, Preston House	29 Locust St	Danvers	c 1855
DAN.84	Pingree, Mary C. - Hyde, Henry G. House	31 Locust St	Danvers	c 1871
DAN.85	Butler, John Calvin House	32 Locust St	Danvers	c 1845
DAN.86	Flint, William House	34 Locust St	Danvers	c 1868
DAN.87	Putnam, Calvin House	35 Locust St	Danvers	c 1862

Inv. No.	Property Name	Street	Town	Year
DAN.88	Putnam - Emerson House	38 Locust St	Danvers	c 1845
DAN.89	Gunn, George A. House	42 Locust St	Danvers	1897
DAN.90	Flint, Samuel - Allen, Albert House	44 Locust St	Danvers	c 1845
DAN.91	Kennedy, James House	45 Locust St	Danvers	c 1848
DAN.92	Putnam, Nathan - Ross, Leland J. House	46 Locust St	Danvers	1874
DAN.93	Putnam - Shillaber - Dudley House	47 Locust St	Danvers	c 1844
DAN.94	Hayman - Felt - Adams House	49 Locust St	Danvers	c 1843
DAN.95	Pope, Ira Preston Factory	50 Locust St	Danvers	c 1859
DAN.96	Barr, John - Elliott, Charles House	51 Locust St	Danvers	c 1844
DAN.97	Danvers District #8 School House	53 Locust St	Danvers	c 1856
DAN.98	Putnam - Sleeper - Legro House	60 Locust St	Danvers	1765
DAN.132	Woodbury - Phelps House	77 Locust St	Danvers	c 1775
DAN.99	Boardman, Nathaniel - Moodey, Sargent House	81 Locust St	Danvers	c 1854
DAN.101	Woodbury, Oliver House	82 Locust St	Danvers	c 1824
DAN.102	Field, Charles H. House	88 Locust St	Danvers	1869
DAN.131	Field, Charles H. House	94 Locust St	Danvers	1869
DAN.128	Brown - Munsey House	98 Locust St	Danvers	c 1819
DAN.103	Boardman, Israel Putnam House	105 Locust St	Danvers	1843
DAN.105	Hooper, Elisha House	116 Locust St	Danvers	c 1866
DAN.157	Porter, Zerubbabel House	127 Locust St	Danvers	c 1826
DAN.138	Porter, Fanny - Phelps, Maurice House	130 Locust St	Danvers	c 1859
DAN.136	Watts, Andrew C. - Pickering, Leonard B. House	139 Locust St	Danvers	c 1903
DAN.137	Cook, Wallace C. House	141 Locust St	Danvers	1919
DAN.106	Putnam, Aaron - Trask, Thomas House	142 Locust St	Danvers	c 1855
DAN.107	Nourse, Sarah Frances Jones House	148 Locust St	Danvers	c 1856
DAN.108	Putnam, Jonathan Jr. House	156 Locust St	Danvers	c 1715
DAN.109	Rea - Pedrick House	159 Locust St	Danvers	c 1756
DAN.129	Putnam, Aaron House	160 Locust St	Danvers	c 1844
DAN.147	Sears, Robert C. House	161 Locust St	Danvers	1955
DAN.148	Newbegin, Cyrus J. House	177 Locust St	Danvers	c 1953
DAN.110	Gould, Daniel House	178 Locust St	Danvers	1857
DAN.111	Fowle Double House	180 Locust St	Danvers	c 1842
DAN.112	Putnam - Boardman House	196 Locust St	Danvers	r 1690
DAN.139	Boardman, Nathaniel House	203 Locust St	Danvers	c 1825
DAN.141	Boardman, Leslie P. House	209 Locust St	Danvers	1907
DAN.149	George, Truman Q. - Kirby, John House	215 Locust St	Danvers	c 1857
DAN.140	Putnam, Samuel - Perley, Elliot House	217 Locust St	Danvers	c 1831
DAN.113	Putnam, Samuel House	220 Locust St	Danvers	c 1813

Inv. No.	Property Name	Street	Town	Year
DAN.114	Putnamville School House	224 Locust St	Danvers	1852
DAN.115	Putnam - White House	240 Locust St	Danvers	c 1839
DAN.150	Sears, John A. House	269 Locust St	Danvers	1855
DAN.803	Putnamville Cemetery	270 Locust St	Danvers	1811
DAN.142	Sears, John - Jenkins, Lawrence W. House	273 Locust St	Danvers	c 1843
DAN.116	Porter - Bradstreet House	487 Locust St	Danvers	c 1664
DAN.501	State Lunatic Hospital - Reservoir Gatehouse	Maple St	Danvers	1876
DAN.502	State Lunatic Hospital - Summerhouse	Maple St	Danvers	1889
DAN.503	State Lunatic Hospital - Female Tubercular Bldg	Maple St	Danvers	1906
DAN.504	State Lunatic Hospital - Male Tubercular Building	Maple St	Danvers	1906
DAN.505	State Lunatic Hospital - Garage	Maple St	Danvers	1908
DAN.506	State Lunatic Hospital - Head - Pump House	Maple St	Danvers	c 1921
DAN.507	State Lunatic Hospital - Sewerscreen House	Maple St	Danvers	1948
DAN.508	State Lunatic Hospital - Repair Shops	Maple St	Danvers	r 1915
DAN.509	State Lunatic Hospital - Old Laundry	Maple St	Danvers	1912
DAN.511	State Lunatic Hospital - Female Nurses Home	Maple St	Danvers	1930
DAN.513	State Lunatic Hospital - Male Nurses Home	Maple St	Danvers	1927
DAN.514	State Lunatic Hospital - Saint Luke's Chapel	Maple St	Danvers	1964
DAN.515	State Lunatic Hospital - Our Lady of the Hill	Maple St	Danvers	c 1955
DAN.516	State Lunatic Hospital - Grove Hall	Maple St	Danvers	1902
DAN.517	State Lunatic Hospital - Farm Hall	Maple St	Danvers	1931
DAN.518	State Lunatic Hospital - Service Building	Maple St	Danvers	1919
DAN.519	State Lunatic Hospital - Vegetable Storage Barn	Maple St	Danvers	1924
DAN.912	State Lunatic Hospital - Power House	Maple St	Danvers	1924
DAN.264	Security National Bank	1 Maple St	Danvers	1854
DAN.265	Bates, Roswell Denveria House	1 Maple St	Danvers	c 1873
DAN.228	Ropes Block	24 Maple St	Danvers	1848
DAN.229	Noyes - Kirby Block	32 Maple St	Danvers	c 1845
DAN.230	Nickerson Block	36 Maple St	Danvers	1911
DAN.263	Caskin Block	41 Maple St	Danvers	c 1898
DAN.272	Ross Block	49 Maple St	Danvers	c 1897
DAN.231	Maple Street School	80 Maple St	Danvers	1899
DAN.232	Learoyd, George - Perley, Frederic House	83 Maple St	Danvers	c 1844
DAN.406	Central Fire Station	135 Maple St	Danvers	c 1850
DAN.233	Saint Mary of the Annunciation Meeting Hall	139 Maple St	Danvers	1914
DAN.234	Preston, Daniel Johnson House	146 Maple St	Danvers	c 1860
DAN.235	Mack, James - Leavitt, Jeremiah House	159 Maple St	Danvers	c 1851
DAN.236	Harris, Samuel House	170 Maple St	Danvers	c 1840

Inv. No.	Property Name	Street	Town	Year
DAN.237	Perry, Henry House	171 Maple St	Danvers	c 1860
DAN.238	Perry, Benjamin Wellington - Kirby, John House	172 Maple St	Danvers	c 1844
DAN.239	Marston, Jacob B. House	176 Maple St	Danvers	c 1861
DAN.240	Putnam, Henry Flint - Hoyt, Thomas House	177 Maple St	Danvers	c 1863
DAN.241	Perry, Edwin Augustus House	206 Maple St	Danvers	c 1850
DAN.242	Pettengill, Daniel House	211 Maple St	Danvers	c 1861
DAN.243	Berry, John House	242 Maple St	Danvers	c 1858
DAN.244	Straw, Samuel E. House	245 Maple St	Danvers	c 1856
DAN.245	Prince - Osborne House	273 Maple St	Danvers	c 1700
DAN.246	Cahill, Daniel House	286 Maple St	Danvers	c 1858
DAN.266	Rea, Uzziel - Dodge, Francis House	289 Maple St	Danvers	c 1715
DAN.247	Straw, Horace C. - Brown Caleb S. Double House	305 Maple St	Danvers	c 1844
DAN.248	McKeag, Timothy House	324 Maple St	Danvers	c 1854
DAN.249	Shepard, Charles Augustus House	334 Maple St	Danvers	c 1859
DAN.63	Putnam - Learoyd House	367 Maple St	Danvers	c 1841
DAN.64	Verry, Daniel House	370 Maple St	Danvers	c 1835
DAN.65	Bradstreet, Albert House	416 Maple St	Danvers	c 1847
DAN.66	Putnam, Ahira House	417 Maple St	Danvers	c 1839
DAN.67	Putnam - Philbrick House	428 Maple St	Danvers	c 1834
DAN.51	Putnam, General Israel House	431 Maple St	Danvers	c 1650
DAN.512	State Lunatic Hospital - Bonner Medical Building	450 Maple St	Danvers	1955
DAN.528	State Lunatic Hospital - Cottage #5	470 Maple St	Danvers	c 1850
DAN.808	Putnam Cemetery	485R Maple St	Danvers	1775
DAN.69	Colcord, Eben House	509 Maple St	Danvers	c 1839
DAN.70	White - Preston House	592 Maple St	Danvers	c 1722
DAN.602		4 Mead St	Danvers	r 1920
DAN.603		6 Mead St	Danvers	r 1920
DAN.604		3 Merrill St	Danvers	r 1950
DAN.605	Crowley, J. House	5 Merrill St	Danvers	r 1850
DAN.606		8 Merrill St	Danvers	r 1880
DAN.607	Harrigan, Jeremiah House	10 Merrill St	Danvers	c 1887
DAN.335	Hood, Richard House	11 Merrill St	Danvers	1850
DAN.608	Endicott, William House	13 Merrill St	Danvers	c 1852
DAN.609	Pitman, George House	15 Merrill St	Danvers	c 1854
DAN.531	State Lunatic Hospital - Salvage Shed	99 Middleton Rd	Danvers	1922
DAN.913	State Lunatic Hospital - Trestle	99 Middleton Rd	Danvers	c 1924
DAN.520	State Lunatic Hospital - Slaughterhouse	111 Middleton Rd	Danvers	1917

Inv. No.	Property Name	Street	Town	Year
DAN.521	State Lunatic Hospital - Hennery	111 Middleton Rd	Danvers	1897
DAN.522	State Lunatic Hospital - Cottage #7	111 Middleton Rd	Danvers	1918
DAN.610	Ross, J. T. House	6 Mill St	Danvers	r 1875
DAN.611	Mead, A. S. House	8 Mill St	Danvers	r 1855
DAN.612	McCarty, T. House	18 Mill St	Danvers	c 1870
DAN.613	Galvin, P. House	19 Mill St	Danvers	c 1870
DAN.614	Carey, D. House	20 Mill St	Danvers	c 1870
DAN.615	Shockroe, E. House	21 Mill St	Danvers	c 1870
DAN.616	Tibbetts, E. E. House	37 Needham Rd	Danvers	r 1850
DAN.617	Needham, William House	39 Needham Rd	Danvers	c 1843
DAN.618	Bancroft, S. N. House	43 Needham Rd	Danvers	r 1850
DAN.319	Russell, Benjamin House	57 Needham Rd	Danvers	1830
DAN.527	State Lunatic Hospital - Cottage #1	240 Newbury St	Danvers	1888
DAN.50	Dwinell, Joseph House	7 Nichols St	Danvers	c 1770
DAN.71	Guilford House	23 Nichols St	Danvers	r 1750
DAN.72	Fisher - Hill House	43 Nichols St	Danvers	c 1838
DAN.569	Nike Missile Area - General Purpose Operations Bldg	72 North St	Danvers	1958
DAN.570	Nike Missile Area - Non-Consolidated HIPAR Radar	72 North St	Danvers	1961
DAN.571	Nike Missile Area - Engine Generator Building	72 North St	Danvers	1958
DAN.572	Nike Missile Area - Company Headquarters Building	72 North St	Danvers	1958
DAN.573	Nike Missile Area - Enlisted Mens' Barracks	72 North St	Danvers	1958
DAN.574	Nike Missile Area - Enlisted Mens' Mess Hall	72 North St	Danvers	1958
DAN.575	Nike Missile Area - Standby Generator Building	72 North St	Danvers	1961
DAN.576	Nike Missile Area - Potable Water Pumping Station	72 North St	Danvers	1958
DAN.577	Nike Missile Area - Fire Truck Storage Building	72 North St	Danvers	1984
DAN.578	Nike Missile Area - 60-Man Fallout Shelter	72 North St	Danvers	1965
DAN.579	Nike Missile Area - Sentry Station	72 North St	Danvers	1968
DAN.935	Nike Missile Area - Radar Tower Pad	72 North St	Danvers	1958
DAN.198	Page, Jeremiah House	11 Page St	Danvers	c 1754
DAN.274	Danvers Memorial Hall	11 Page St	Danvers	1930
DAN.199	Putnam - Endicott - Osgood House	2 Park St	Danvers	c 1774
DAN.200	Eaton, Everett - Smart, John L. House	6 Park St	Danvers	1877
DAN.201	Pillsbury, Elias House	18 Park St	Danvers	1843
DAN.203	Marston, Jacob House	32 Park St	Danvers	1898
DAN.805	Old Settler's Cemetery	Pat Rd	Danvers	1781

Inv. No.	Property Name	Street	Town	Year
DAN.202	Putnam, Simeon Jr. House	7 Peabody Ave	Danvers	1857
DAN.204	Silvester, Joshua House	11 Peabody Ave	Danvers	c 1857
DAN.619		11 Perry St	Danvers	r 1920
DAN.620		14 Perry St	Danvers	r 1875
DAN.621		15 Perry St	Danvers	r 1920
DAN.305	Woodbury, Hezekiah House	50 Pine St	Danvers	c 1832
DAN.306	Cheever, Israel House	57 Pine St	Danvers	c 1828
DAN.307	Overlook	67 Pine St	Danvers	c 1842
DAN.308	Nurse, Samuel Putnam House	85 Pine St	Danvers	c 1833
DAN.314	Tapleyville Methodist Church Parsonage	123 Pine St	Danvers	c 1898
DAN.40	Nurse, Rebecca House	149 Pine St	Danvers	1678
DAN.812	Nurse, Rebecca Burying Ground	149R Pine St	Danvers	1692
DAN.905	Nurse, Rebecca Monument	149R Pine St	Danvers	1885
DAN.205	Pope, Ira Preston House	14 Poplar St	Danvers	c 1847
DAN.206	Putnam, George Adams House	20 Poplar St	Danvers	c 1846
DAN.207	Putnam, Calvin - Juul, Augusta L. House	22 Poplar St	Danvers	c 1857
DAN.208	Fiske, George W. - King John House	23 Poplar St	Danvers	1882
DAN.209	Gould, Charles Henry House	28 Poplar St	Danvers	c 1856
DAN.262	Marden, Betsy - Pettingell, Marcus C. House	41 Poplar St	Danvers	c 1860
DAN.210	Fiske, George - Perry, James House	43 Poplar St	Danvers	c 1868
DAN.151	Sleeper, Hannah - Putnam, Edwin F. House	32 Popular St	Danvers	c 1853
DAN.152	Putnam, Nathaniel T. - Trask, Thomas S. House	35 Popular St	Danvers	c 1876
DAN.153	Sawyer, James M. - Ridley, Lyman House	42 Popular St	Danvers	c 1847
DAN.251	Berry, David - Flint, Samuel V. House	47 Popular St	Danvers	c 1846
DAN.154	Bomer, William - Usher, David R. House	48 Popular St	Danvers	c 1844
DAN.155	Berry, David - Wright, Franklin House	49 Popular St	Danvers	c 1840
DAN.250	Woodbury, Tristram House	51 Popular St	Danvers	c 1851
DAN.156	Perley, Dean A. House	54 Popular St	Danvers	c 1863
DAN.804	Preston Cemetery	57 Preston St	Danvers	1774
DAN.60	Legro, Edmund House	9 Prince St	Danvers	c 1855
DAN.268	Lander Barracks	24 Purchase St	Danvers	c 1862
DAN.211	Advent Chapel	2 Putnam Ct	Danvers	1877
DAN.213	Baker, Daniel Brooks House	4 Putnam Ct	Danvers	c 1850
DAN.212	Batchelder, Ezra House	6 Putnam Ct	Danvers	c 1836
DAN.184	Putnam, Adrian House	3 Putnam St	Danvers	c 1839
DAN.580	Portside Cape Ann Diner	2 River St	Danvers	1948
DAN.360	Eveleth, Francis House	5 River St	Danvers	1874
DAN.361	Felton, Lewis Edward House	6 River St	Danvers	1875

Inv. No.	Property Name	Street	Town	Year
DAN.362	Eveleth, Francis House	9 River St	Danvers	c 1876
DAN.320	Ross, Josiah House	10 River St	Danvers	1855
DAN.338	Lander Barracks	14 River St	Danvers	1862
DAN.321	Elliott, Moody House	15 River St	Danvers	1855
DAN.385	Sullivan, James House	16 River St	Danvers	1873
DAN.363	Sawyer, Rachael M. - Perkins, M. K. House	17 River St	Danvers	1850
DAN.364	Dwinnell, Joseph Jr. - Bates, Albert A. House	19 River St	Danvers	1846
DAN.386	Sullivan, John House	20 River St	Danvers	1870
DAN.365	Blake, Henry J. House	24 River St	Danvers	1845
DAN.387	Scidmore, Stephen F. House	26 River St	Danvers	1853
DAN.921	Route 128 Bridge Over Crane River	Route 128	Danvers	1940
DAN.922	Route 128 Railroad Bridge	Route 128	Danvers	1940
DAN.930	Route 128 Bridge over High Street	Route 128	Danvers	1940
DAN.920	Route 128 Bridge over Waters River	Rt 128	Danvers	1940
DAN.923	Route 128 Bridge over Porter River	Rt 128	Danvers	1941
DAN.931	Route 128 Bridge over Elliott Street	Rt 128	Danvers	1941
DAN.810	Prince Cemetery	9 Spring St	Danvers	1759
DAN.73	Nichols, George Jr. House	21 Spring St	Danvers	c 1853
DAN.75	Phillips - Lawrence House	36 Spring St	Danvers	c 1800
DAN.74	Phillips, Stephen Barn	40 Spring St	Danvers	c 1827
DAN.76	Spring, Jacob E. House	50 Spring St	Danvers	1881
DAN.940	Saint John The Evangelist and Apostle Statue	50 Spring St	Danvers	c 1915
DAN.938	Witchcraft Victims' Memorial	15 Stone St	Danvers	1992
DAN.807	Wadsworth Cemetery	18 Summer St	Danvers	1696
DAN.77	Putnam, James Jr. House	42 Summer St	Danvers	c 1715
DAN.78	Conant, Silas House	53R Summer St	Danvers	1882
DAN.214	Danvers Town Hall	1 Sylvan St	Danvers	1855
DAN.902	Soldiers Monument	1 Sylvan St	Danvers	c 1870
DAN.257	Ropes, Henry T. - Putnam, John - Perry, W. House	2 Sylvan St	Danvers	c 1842
DAN.215	Richards, Eva H. - Pickering, Eva A. House	4 Sylvan St	Danvers	c 1912
DAN.216	Hammond, William Sumner House	10 Sylvan St	Danvers	c 1854
DAN.217	Langley, John Russell House	11 Sylvan St	Danvers	c 1855
DAN.218	Lord, Edward - Peabody, George House	12 Sylvan St	Danvers	1875
DAN.219	Gorton, Mary Elizabeth House	13 Sylvan St	Danvers	c 1903
DAN.932	Peabody Institute Library Bronze Urn	13 Sylvan St	Danvers	
DAN.221	Batchelder, John Quincy Adams House	20 Sylvan St	Danvers	c 1870
DAN.220	Peabody Institute	23 Sylvan St	Danvers	1892

Inv. No.	Property Name	Street	Town	Year
DAN.222	Batchelder, John Quincy Adams House	24 Sylvan St	Danvers	c 1905
DAN.223	Cass, John Waldleigh House	121 Sylvan St	Danvers	c 1846
DAN.224	Tapley, Nathan House	127 Sylvan St	Danvers	c 1852
DAN.225	Brigham, Munroe T. House	145 Sylvan St	Danvers	c 1857
DAN.226	Tapley, Nathan - Walcott, William House	160 Sylvan St	Danvers	c 1831
DAN.227	Tapley, Asa House	164 Sylvan St	Danvers	c 1831
DAN.309	Wright, Frederick House	6 Wadsworth St	Danvers	c 1857
DAN.310	Hains, Thomas House	8 Wadsworth St	Danvers	c 1854
DAN.315	Lovejoy, Walter S. House	9 Wadsworth St	Danvers	1874
DAN.311	Wilson, James House	10 Wadsworth St	Danvers	c 1859
DAN.61	Fawcett, Dexter H. House	8 Walnut St	Danvers	c 1855
DAN.312	Scampton, Joseph House	21 Washington St	Danvers	c 1860
DAN.313	Palmer, Benjamin H. - Tapley, Charles House	30 Washington St	Danvers	c 1851
DAN.900	Waters River Bridge	Water St	Danvers	1927
DAN.917	Water Street Bridge Over the Crane River	Water St	Danvers	r 1980
DAN.322	Danversport Baptist Church	3 Water St	Danvers	1848
DAN.366	Waldron, Edward T. House	5 Water St	Danvers	1847
DAN.367	Ross, Josiah House	6 Water St	Danvers	1878
DAN.368	Hunt, Ebenezer House	7 Water St	Danvers	1846
DAN.323	Danversport School House	10 Water St	Danvers	1895
DAN.622	Woodman - Mead House	12 Water St	Danvers	c 1870
DAN.623	Warren, J. House	14 Water St	Danvers	c 1870
DAN.624	Gallivan, Patrick H. Grocery Store	16 Water St	Danvers	r 1920
DAN.629	George, James Variety Store	18A Water St	Danvers	r 1920
DAN.369	Bates, Albert Augustus House	19 Water St	Danvers	1889
DAN.625	Batchelder, Dr. House	20 Water St	Danvers	r 1880
DAN.626	Gould, Andres House	21 Water St	Danvers	c 1852
DAN.324	Black, Moses - William - Oakes, Nathan House	25 Water St	Danvers	1834
DAN.901	Hutchinson, Israel Monument	35 Water St	Danvers	1896
DAN.337	Hutchinson, Israel Jr. - Ober, Jacob L. House	60 Water St	Danvers	c 1829
DAN.388	Dennett, George B. House	65 Water St	Danvers	1881
DAN.325	Cheever, Thomas House	69 Water St	Danvers	1836
DAN.371	Endicott, Capt. Moses House	73 Water St	Danvers	1799
DAN.372	Endicott, Capt. John Jr. House	75 Water St	Danvers	1798
DAN.326	Fuller, Andrew House	77 Water St	Danvers	1793
DAN.327	Perley, Eliphalet - Porter, Nathan House	79 Water St	Danvers	1774
DAN.328	Fox Hill School	81 Water St	Danvers	1879
DAN.627	Bockliff, J. House	82 Water St	Danvers	r 1875

Inv. No.	Property Name	Street	Town	Year
DAN.628	Stearns Marine Company of Boston Yacht Yard	124 Water St	Danvers	c 1935
DAN.329	Riverbank	154 Water St	Danvers	1853
DAN.937	Hussey, William Penn Equestrian Statue	169 Water St	Danvers	1916
DAN.926	Waters River Railroad Bridge	Waters River	Danvers	1945
DAN.966	Waters River Stone Retaining Walls	Waters River	Danvers	
DAN.143	Putnam, Steven - Trask House	3 Wenham St	Danvers	c 1806
DAN.133	Weston - Sheldon House	8 Weston St	Danvers	c 1872
DAN.125	Hill, John - Chase House	8 Winthrop St	Danvers	c 1882
DAN.126	Pope, Jasper F. House	11 Winthrop St	Danvers	c 1859
DAN.127	Creese, William House	15 Winthrop St	Danvers	1923

Appendix E

Reference Documents

Pollutant Impacts on Water Quality

Sediment	Sediment is a common component of stormwater, and can be a pollutant. Sediment can be detrimental to aquatic life (primary producers, benthic invertebrates, and fish) by interfering with photosynthesis, respiration, growth, reproduction, and oxygen exchange in water bodies. Sediment can transport other pollutants that are attached to it including nutrients, trace metals, and hydrocarbons. Sediment is the primary component of total suspended solids (TSS), a common water quality analytical parameter.
Nutrients	Nutrients including nitrogen and phosphorous are the major plant nutrients used for fertilizing landscapes, and are often found in stormwater. These nutrients can result in excessive or accelerated growth of vegetation, such as algae, resulting in impaired use of water in lakes and other sources of water supply. For example, nutrients have led to a loss of water clarity in Lake Tahoe. In addition, un-ionized ammonia (one of the nitrogen forms) can be toxic to fish.
Bacteria and Viruses	Bacteria and viruses are common contaminants of stormwater. For separate storm drain systems, sources of these contaminants include animal excrement and sanitary sewer overflow. High levels of indicator bacteria in stormwater have led to the closure of beaches, lakes, and rivers to contact recreation such as swimming.
Oil and Grease	Oil and grease includes a wide array of hydrocarbon compounds, some of which are toxic to aquatic organisms at low concentrations. Sources of oil and grease include leakage, spills, cleaning and sloughing associated with vehicle and equipment engines and suspensions, leaking and breaks in hydraulic systems, restaurants, and waste oil disposal.
Metals	Metals including lead, zinc, cadmium, copper, chromium, and nickel are commonly found in stormwater. Many of the artificial surfaces of the urban environment (e.g., galvanized metal, paint, automobiles, or preserved wood) contain metals, which enter stormwater as the surfaces corrode, flake, dissolve, decay, or leach. Over half the trace metal load carried in stormwater is associated with sediments. Metals are of concern because they are toxic to aquatic organisms, can bioaccumulate (accumulate to toxic levels in aquatic animals such as fish), and have the potential to contaminate drinking water supplies.
Organics	Organics may be found in stormwater at low concentrations. Often synthetic organic compounds (adhesives, cleaners, sealants, solvents, etc.) are widely applied and may be improperly stored and disposed. In addition, deliberate dumping of these chemicals into storm drains and inlets causes environmental harm to waterways.
Pesticides	Pesticides (including herbicides, fungicides, rodenticides, and insecticides) have been repeatedly detected in stormwater at toxic levels, even when pesticides have been applied in accordance with label instructions. As pesticide use has increased, so too have concerns about the adverse effects of pesticides on the environment and human health. Accumulation of these compounds in simple aquatic organisms, such as plankton, provides an avenue for biomagnification through the food web, potentially resulting in elevated levels of toxins in organisms that feed on them, such as fish and birds.
Gross Pollutants	Gross Pollutants (trash, debris and floatables) may include heavy metals, pesticides, and bacteria in stormwater. Typically resulting from an urban environment, industrial sites and construction sites, trash and floatables may create an aesthetic "eye sore" in waterways. Gross pollutants also include plant debris (such as leaves and lawn-clippings from landscape maintenance), animal excrement, street litter, and other organic matter. Such substances may harbor bacteria, viruses, vectors, and depress the dissolved oxygen levels in streams, lakes and estuaries sometimes causing fish kills.
Vector Production	Vector production (e.g., mosquitoes, flies, and rodents) is frequently associated with sheltered habitats and standing water. Unless designed and maintained properly, standing water may occur in treatment control BMP's for 72 hours or more, thus providing a source for vector habitat and reproduction (Metzger, 2002).

Source: California Stormwater Quality Association, Stormwater BMP Handbook, 2003.

Potential pollutants likely associated with specific *municipal facilities*

Municipality Facility Activity	Potential Pollutants								
	Sediment	Nutrients	Trash	Metals	Bacteria	Oil & Grease	Organics	Pesticides	Oxygen Demanding Substances
Building and Grounds Maintenance and Repair	X	X	X	X	X	X	X	X	X
Parking/Storage Area Maintenance	X	X	X	X	X	X	X		X
Waste Handling and Disposal	X	X	X	X	X	X	X	X	X
Vehicle and Equipment Fueling			X	X		X	X		
Vehicle and Equipment Maintenance and Repair				X		X	X		
Vehicle and Equipment Washing and Steam Cleaning	X	X	X	X		X	X		
Outdoor Loading and Unloading of Materials	X	X	X	X		X	X	X	X
Outdoor Container Storage of Liquids		X		X		X	X	X	X
Outdoor Storage of Raw Materials	X	X	X			X	X	X	X
Outdoor Process Equipment	X		X	X		X	X		
Overwater Activities			X	X	X	X	X	X	X
Landscape Maintenance	X	X	X		X			X	X

Source: California Stormwater BMP Handbook (<http://www.cabmphandbooks.com/>)(slightly modified)

Potential pollutants likely associated with *municipal activities*

Municipal Program	Activities	Potential Pollutants								
		Sediment	Nutrients	Trash	Metals	Bacteria	Oil & Grease	Organics	Pesticides	Oxygen Demanding Substances
Roads, Streets, and Highways Operation and Maintenance	Sweeping and Cleaning	X		X	X		X			X
	Street Repair, Maintenance, and Striping/Painting	X		X	X		X	X		
	Bridge and Structure Maintenance	X		X	X		X	X		
Plaza, Sidewalk, and Parking Lot Maintenance and Cleaning	Surface Cleaning	X	X			X	X			X
	Graffiti Cleaning	X	X		X			X		
	Sidewalk Repair	X		X						
	Controlling Litter	X		X		X	X			X
Fountains, Pools, Lakes, and Lagoons Maintenance	Fountain and Pool Draining		X					X		
	Lake and Lagoon Maintenance	X	X	X		X			X	X
Landscape Maintenance	Mowing/Trimming/Planting	X	X	X		X			X	X
	Fertilizer & Pesticide Management	X	X						X	
	Managing Landscape Wastes			X					X	X
	Erosion Control	X	X							
Drainage System Operation and Maintenance	Inspection and Cleaning of Stormwater Conveyance Structures	X	X	X		X		X		X
	Controlling Illicit Connections and Discharges	X	X	X	X	X	X	X	X	X
	Controlling Illegal Dumping	X	X	X	X	X	X	X	X	X
	Maintenance of Inlet and Outlet Structures	X		X	X		X			X
Waste Handling and Disposal	Solid Waste Collection		X	X	X	X	X	X		X
	Waste Reduction and Recycling			X	X					X
	Household Hazardous Waste Collection			X	X		X	X	X	
	Controlling Litter			X	X	X		X		X
	Controlling Illegal Dumping	X		X		X	X		X	X
Water and Sewer Utility Operation and Maintenance	Water Line Maintenance	X				X	X			
	Sanitary Sewer Maintenance	X				X	X			X
	Spill/Leak/Overflow Control, Response, and Containment	X	X			X		X		X

Source: California Stormwater BMP Handbook (<http://www.cabmphandbooks.com/>)

GREENSCAPES NORTH SHORE COALITION

MCM 1: Public Education and Outreach - NOI FORM

* All literature and media will be available online at www.greenscapes.org and can be shared with member communities at any time.

** Community can decide how to address Greenscapes' involvement. They may choose to list GS as an external contractor, or can list whomever in their town GS communicated with for each BMP, respectively.

BMP Media/ Category	BMP Description*	Targeted Audience	Responsible Parties/ Depts**	Measurable Goal	Implementation Year
Brochure/ Pamphlets	Brochure will consist of a 'how-to-guide' for residents on how rain gardens work and how to install them at their home.	Residents	Greenscapes North Shore Coalition	- Number distributed - Resident testimonials	2018 (Fall)
Brochure/ Pamphlets	An updated version of comprehensive literature, discussing the importance of "greenscaping", small-scale stormwater management practices, sewer/septic system maintenance and other ways to avoid illicit discharge.	Residents	Greenscapes North Shore Coalition	- Number distributed - Resident testimonials	2019 (Spring)
Workshop/ Info Sheet	Workshop and associated literature will cover LID options for reducing runoff and promoting on-site infiltration. Pricing, maintenance and ordinances will also be discussed.	Developers (Construction)	Greenscapes North Shore Coalition and <i>municipal entity</i>	- Number of attendees - Increase in LID use	2019 (Winter)
Displays/ Posters/ Kiosks	Informational poster will be placed in area with heavy dog/walker traffic. Poster will describe proper pet waste management and disposal.	Residents	Greenscapes North Shore Coalition	- Pilot surveys may be conducted before and after message posting	2019 (Spring)
Brochure/ Pamphlets	Pet Waste literature is available in two forms (one page info sheet or rack card) and can be redistributed as necessary.	Residents	Greenscapes North Shore Coalition	- Number distributed - Resident testimonials	2018
Social Media Post	Greenscapes will provide content for a social media "blast" on town Facebooks etc. Ex. Autumnal facebook post describing proper disposal of leaf collection, and springtime post about proper lawn/fertilizer maintenance.	Residents	Greenscapes North Shore Coalition and <i>municipal entity</i>	- Number of views/ likes/ comments - Resident testimonials before and after posting	2018
School Curriculae/ Programs	<i>Elementary School Name</i> will host Greenscapes "Keeping Water Clean" Program.	Residents	Greenscapes North Shore Coalition	- Number of students/ teachers/ volunteers in attendance - Subset of students evaluated before and after program	2018
Brochure/ Pamphlets	Brochure will include general info on LIDs that can assist in stormwater management and pollution prevention. Content will be targeted to "environmental contacts" at industrial facilities, or property managers where applicable.	Industrial Facilities	Greenscapes North Shore Coalition	- Number distributed - Phone call followup	FY2020
Workshop	Stormwater presentation will discuss specific BMPs for parking lots; how to reduce impervious surfaces, and maintain the space more sustainably.	Businesses/ Institutions and Commercial Facilities	Greenscapes North Shore Coalition and <i>municipal entity</i>	- Number of attendees - Number of presentations re-distributed to commercial representatives.	FY2020
Displays/ Posters/ Kiosks	An updated version of informational display, discussing the importance of "greenscaping", small-scale stormwater management practices, sewer/septic system maintenance and other ways to avoid illicit discharge.	Residents	Greenscapes North Shore Coalition	- Number distributed - Resident testimonials	FY2020
Brochure/ Pamphlets	Pet Waste literature is available in two forms (one page info sheet or rack card) and can be redistributed as necessary.	Residents	Greenscapes North Shore Coalition	- Number distributed - Resident testimonials	FY2020
Social Media Post	Greenscapes will provide content for a social media "blast" on town Facebooks etc. Ex. Autumnal facebook post describing proper disposal of leaf collection, and springtime post about proper lawn/fertilizer maintenance.	Residents	Greenscapes North Shore Coalition and <i>municipal entity</i>	- Number of views/ likes/ comments - Resident testimonials before and after posting	FY2020
School Curriculae/ Programs	<i>Elementary School Name</i> will host Greenscapes "Keeping Water Clean" Presentation.	Residents	Greenscapes North Shore Coalition	- Number of students/ teachers/ volunteers in attendance - Subset of students evaluated before and after program	FY2020

Workshop	Workshop and literature will go into greater detail, following the workshop regarding low impact development held in year one. City ordinances and associated incentives will be outlined.	Developers (Construction)	Greenscapes North Shore Coalition and <i>municipal entity</i>	- Number of attendees	FY2021
Web Page	Story Map will outline and describe different examples of existing low-impact-developments in the North Shore Community.	Residents	Greenscapes North Shore Coalition	- Number of map views - Resident testimonials on LID awareness	FY2021
Brochure/ Pamphlets	Pet Waste literature is available in two forms (one page info sheet or rack card) and can be redistributed as necessary.	Residents	Greenscapes North Shore Coalition	- Number distributed - Resident testimonials	FY2021
Social Media Post	Greenscapes will provide content for a social media "blast" on town Facebooks etc. Ex. Autumnal facebook post describing proper disposal of leaf collection, and springtime post about proper lawn/fertilizer maintenance.	Residents	Greenscapes North Shore Coalition and <i>municipal entity</i>	- Number of views/ likes/ comments - Resident testimonials before and after posting	FY2021
School Curriculae/ Programs	<i>Elementary School Name</i> will host Greenscapes "Keeping Water Clean" Program.	Residents	Greenscapes North Shore Coalition	- Number of students/ teachers/ volunteers in attendance - Subset of students evaluated before and after program	FY2021
Meeting/ Presentation	Presentation will discuss proper "greenscaping" practices on a business/commercial level. Content will be targeted to property managers and will include sand/salt storage and landscape management.	Businesses/ Institutions and Commercial Facilities	Greenscapes North Shore Coalition and <i>municipal entity</i>	- Number of attendees	FY2022
Meeting/ Presentation	Presentation will discuss proper "greenscaping" practices on an industrial level. Content will be targeted to property managers and will include sand/salt storage and landscape management.	Industrial Facilities	Greenscapes North Shore Coalition and <i>municipal entity</i>	- Number of attendees	FY2022
Brochure/ Pamphlets	"What not to Flush" rack card will raise resident awareness of the damages of flushing things like wipes and grease in their toilets/sinks.	Residents	Greenscapes North Shore Coalition	- Number distributed - Resident testimonials	FY2022
Brochure/ Pamphlets	Pet Waste literature is available in two forms (one page info sheet or rack card) and can be redistributed as necessary.	Residents	Greenscapes North Shore Coalition	- Number distributed - Resident testimonials	FY2022
Social Media Post	Greenscapes will provide content for a social media "blast" on town Facebooks etc. Ex. Autumnal facebook post describing proper disposal of leaf collection, and springtime post about proper lawn/fertilizer maintenance.	Residents	Greenscapes North Shore Coalition and <i>municipal entity</i>	- Number of views/ likes/ comments - Resident testimonials before and after posting	FY2022
School Curriculae/ Programs	<i>Elementary School Name</i> will host Greenscapes "Keeping Water Clean" Program.	Residents	Greenscapes North Shore Coalition	- Number of students/ teachers/ volunteers in attendance - Subset of students evaluated before and after program	FY2022
Meeting/ Presentation	Greenscapes NS will conduct a "Greenscapes 101" presentation for residents at <i>site of community's choosing</i> . Presentation will discuss the importance of clean and plentiful water.	Residents	Greenscapes North Shore Coalition	- Number of attendees - Resident testimonials	FY2023
Special Events/ Festivals/ Fairs	Greenscapes representatives will attend a trade show expo, with the intent of sharing "Greenscaping" practices and the importance of LIDs with Landscapers and Developers.	Developers (Construction)	Greenscapes North Shore Coalition	- Number of materials distributed - Number of contacts made - Developer testimonials	FY2023
Brochure/ Pamphlets	Pet Waste literature is available in two forms (one page info sheet or rack card) and can be redistributed as necessary.	Residents	Greenscapes North Shore Coalition	- Number distributed - Resident testimonials	FY2023
Social Media Post	Greenscapes will provide content for a social media "blast" on town Facebooks etc. Ex. Autumnal facebook post describing proper disposal of leaf collection, and springtime post about proper lawn/fertilizer maintenance.	Residents	Greenscapes North Shore Coalition and <i>municipal entity</i>	- Number of views/ likes/ comments - Resident testimonials before and after posting	FY2023
School Curriculae/ Programs	<i>Elementary School Name</i> will host Greenscapes "Keeping Water Clean" Program.	Residents	Greenscapes North Shore Coalition	- Number of students/ teachers/ volunteers in attendance - Subset of students evaluated before and after program	FY2023

Tips for Organizing and Conducting Volunteer Clean-up Events

By: Jen Drociak –Acting Coordinator / Volunteer, Manchester Urban Ponds Restoration Program (UPRP)

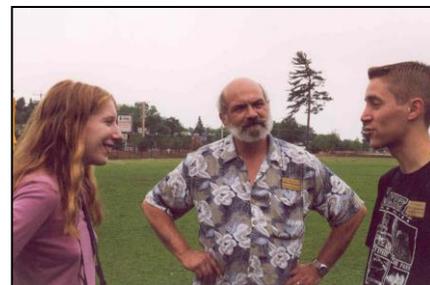
Step 1: Plan Your Clean-Up Event

- A. Land and / or Shore? Determine the Location(s):** Determine where, in proximity to the waterbody, your group wishes to concentrate its efforts on during a clean-up event. To find heavily-littered areas, and / or areas that are prone to illegal dumping, walk along the shore, in advance, to identify location(s) for the clean-up event. Identify accessible paths along the shoreline and / or on public trails that are easy for people to walk. The location(s) may be largely determined by public (or lake / homeowner association) access points such as a public beach, boat-launch, or park. If the location is large, consider identifying smaller locations within the larger location which can be managed by individual group leaders and groups. Determining the location(s) will provide you with an idea of the footwear that may be needed for the task based upon the terrain. If the clean-up event will be located at a beach or a dry area, sandals or sneakers may be adequate. If it will be located in a wetland or mucky area, knee-boots may be appropriate. If it will be located in water, hip-boots may be most appropriate. Determining the location(s) will also provide you with a sense of how many volunteers your group is seeking for the clean-up event.



The UPRP typically focuses clean-up efforts in the parks adjacent to the ponds by skirting around the ponds themselves. This involves differing terrain, and thus footwear. There have been occasions, however, where one or more volunteers have also used a small fishing boat to retrieve trash from the water that is too deep to obtain via hip-waders.

- B. Obtain Landowner Permission:** Whether the location(s) of your clean-up event is / are municipally-owned or privately-owned, determine who owns the property in advance in order to obtain permission. If you do not know who the property owner is, visit your municipality's on-line assessor's website to review the tax map(s) and property card(s) associated with the area. It is typically easy to obtain permission to organize a clean-up on municipally-owned / public land. If the location(s) are on privately-owned land, talk to the land owner(s) and explain why you are organizing a clean-up in that area, along with the benefits of doing so. Obtain permission from them in writing, if you can, by considering they sign a form. Verbal permission may be adequate, however.



The UPRP organizes clean-up events on land owned by Public Works and Parks, Recreation, and Cemetery Departments. We have not had to seek private landowner permission. We simply notify the Manchester Public Works Department and Parks, Recreation, and Cemetery Department of the dates of the clean-up events.

- C. Determine the Task(s) at Hand:** Determine what you will request of your volunteers. Will it be the removal of trash only? If so, will it be the removal of large items only or all items including the minutia? Will it be the removal of yard waste only? Graffiti removal or other vandalism? All of the above? Determining the task(s) at hand will provide you with an idea of the supplies (and hours) you will need to perform the task(s).



The UPRP typically removes trash only. We typically do not pick up the minutia (cigarette butts, bottle caps, etc.) due to the large volume of trash we collect and the limited amount of time and volunteers we have at each clean-up event.

D. Determine the Check-In Location: Based upon the chosen location(s) of the clean-up event, consider and determine the most appropriate location for volunteers to initially gather to check in and obtain supplies, as well as to reconvene at the end of the clean-up event. This may be a kiosk, boat-launch, or specific location on a beach or in a park. Try to stay away from busy roads or areas that are difficult to access.

The UPRP typically requests that volunteers meet in one central / well-known location such as a kiosk in a parking lot or boat-launch. We have kept the initial meeting location at each clean-up event consistent over the years.



E. Determine the Most Appropriate Age(s) of Your Volunteers: Based upon the task(s) at hand, determine the most appropriate age(s) of your volunteers. Are you seeking adults only? Children? Both? Do you have tasks that all can partake in, or are the tasks age-specific?

The UPRP generally seeks volunteers of all ages for clean-up events and encourage everyone, despite their age or ability, to participate in a manner of how they most feel comfortable.

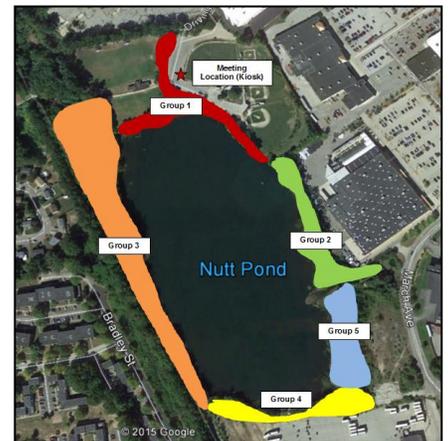


F. Determine the Desired Number of Volunteers: Based upon the number and location(s) that are chosen for the clean-up event, determine the desired number of volunteers to partake in the event.

The UPRP typically splits the area adjacent to the ponds into several areas, or groups of volunteers.

G. Create Map(s) of the Location(s) OR Plan on Designating a “Group Leader” for Each Location: If the location(s) is / are large enough to break into more than one group during the clean-up event, consider making aerial photographic “maps” (or using topographic maps) of each group’s area, indicating on the map the original meeting location, and the group’s start and end point.

The UPRP has created aerial maps to use in the past. However, what we consider to be more helpful is having a “group leader” (returning volunteer or someone familiar with the area) lead a small group of other volunteers in each designated area.



Step 2: Schedule Your Clean-Up Event

A. Choose a Date: Choose a date for the clean-up event at a time of year that makes the most sense to your group. Keep in mind that while lakes and ponds have year-round residents, the majority of residents are likely seasonal and may not arrive for the season, or on or around Memorial Day weekend. Thus, a late-spring or late-fall cleanup may not be the most appropriate time as it may not garner the most volunteers. An early or mid-summer cleanup may be the most appropriate. Consider, perhaps, scheduling the event in conjunction with an annual lake association meeting or holiday barbeque. Also consider scheduling the date of the clean-up event at least a month in advance to allow time to prepare (gather supplies and recruit volunteers). Lastly, consider a rain date.



The UPRP typically schedules annual pond and park cleanups on Saturday mornings during the last two weeks in April and the first one or two weeks in May. This is because a) this time of year is typically after the snow has melted and b) this time of year is typically before “leaf-in” (and in the case of some of these areas, this is important, as the areas are overtaken with thick stands of invasive species). We do not offer rain dates.

- B. Choose a Time:** Determine the amount of time it may take to clean up the area(s) of your choosing. Will it take one hour? Two hours? More? This is also a factor of the number of volunteers that attend (typically the more volunteers that attend the least amount of time the clean-up will take). If you believe the area(s) may take more than two hours, it may be best to schedule a two-part clean-up event. Also consider the time of day most appropriate to your group, especially if it is scheduled in conjunction with (or before or after) another event such as an annual meeting or holiday barbeque.



The UPRP has realized that 1 ½ - 2 hours is a sufficient amount of time to allot to clean-up events. We also realize that volunteers typically do not have the time or patience to commit to any more time in one day than that. We have also typically scheduled the clean-up events from 9:00AM to 11:00AM, with a meeting time of no later than 8:50AM. Early-morning clean-up events afford volunteers to have the remainder of the day for other things.

Step 3: Determine and Obtain Necessary Supplies

- A. Determine the Necessary Supplies:** Determining the task(s) at hand will determine your necessary supplies. If your clean-up event is strictly a trash removal cleanup, you may only need to obtain latex gloves and trash bags. If your clean-up event also includes yard-waste removal, you may need to obtain paper yard-waste bags, rakes and / or other tools.

Since the UPRP clean-up events are strictly focused on trash-removal, the only supplies we must procure are latex gloves (medium sized) and trash bags. We also have a few hand-held trash-grabbers since some volunteers find them helpful in reaching difficult areas and / or to prevent excessive bending.



- B. Obtain the Necessary Supplies:** Determine how you will obtain the necessary supplies. Does your group have a budget? Will your group be purchasing your supplies? Will your group fundraise to purchase supplies? Will your group borrow supplies, from perhaps the town or city?

The UPRP typically obtains supplies from the Manchester Parks, Recreation, and Cemetery Department. These supplies typically only include latex gloves and trash bags, but have included, in the past, rakes, other tools and yard waste bags. We also typically have a large container of hand-sanitizer available.

- C. Obtain a First-Aid Kit:** Consider obtaining one or more First Aid kits (for one or more groups of volunteers) in case it is needed. It is better to be proactively safe!

The UPRP has one First-Aid kit for use.

- D. Consider Providing Water and Snacks:** If your group has the financial means, consider providing water and snacks to your volunteers for afterwards. If your group does not have the financial means, consider soliciting donations from local establishments or having your group bake some treats, and bring a large cooler of ice water (or iced-tea) and some paper (or reusable plastic) cups.

The UPRP does not regularly provide water and snacks to volunteers since we do not have a budget to do so. On occasion, we have been able to obtain donations for yogurt snacks from Stonyfield Farm. On occasion we have also brought or made a baked good.



Step 4: Determine Your Waste Disposal Options

- A. Determine Your Waste Disposal Options:** At the end of your clean-up event, determine how and where you will dispose of the trash that was collected. Is there a dumpster on site that your group has permission to use? Are there already trash and / or recycling carts on site that your group has permission to use? If not, consider contacting your municipality's Highway Department, Parks & Recreation Department, or Road Agent, at least a month in advance, who may be able to coordinate trash and / or recycling pickup from your municipality's vendor (i.e. Waste Management, Pinard, etc.). Determine when the trash and / or recycling will be picked up and what the requirements for pickup are (especially with items such as vehicular tires and batteries, etc.). In addition, consider recruiting volunteers with pick-up trucks, especially if your group is cleaning multiple areas, and trash must be stockpiled in one area at the end of the event. Similarly, if you cannot obtain trash pick-up services, volunteers with pick-up trucks, and a municipal sticker (or permission) may be able to haul the trash and / or recycling to your local landfill or transfer station for free.



The UPRP typically sends notification of the clean-up schedule to the Manchester Public Works Director as soon as the dates are calendared. The Public Works Director, or staff, has coordinated with Manchester's solid waste collection staff to collect the trash on the Monday following the cleanup event (which have been held on Saturdays). While there have been a few times the Public Works Department has made one or more 95-gallon recycling carts available for the clean-up events, they are generally not available, and therefore, recycling is not typically sorted from other debris. All (tied / secure) bags of trash have been neatly placed in the same locations over the years; typically underneath or adjacent to the informational kiosks. Trash collected that does not fit into bags is also neatly placed adjacent to the bagged trash. We also recruit volunteers with pick-up trucks so that trash from different areas of the cleanup can be taken to one designated location at the end of the event. In addition, one of our volunteers separates steel and other scrap metal and takes it to a scrap metal recycling facility.

Step 5: Advertise Your Clean-Up Event / Recruit Volunteers

- A. Determine Any Project Partners:** In addition to volunteers who live around the waterbody, and any other residents of the town, determining any existing local groups or clubs that may be able to assist with the clean-up event is always helpful. Is there a local middle school, high school, or even college (if nearby) environmental club? A local chapter of the Student Conservation Association (SCA)? Any other organization, volunteer group, or club? A lot of these groups and / or clubs seek new community service projects and can help you garner additional / new volunteers.



The UPRP has partnered with the Student Conservation Association, local high school ecology clubs, local boy-scout troops, trout-fishing clubs, geo-caching groups, and others in the past. This has helped garner additional / new volunteers.

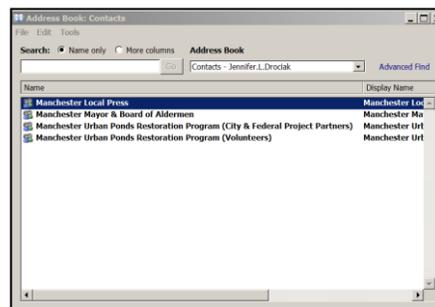
- B. Determine the Best Way(s) to Advertise Your Clean-Up Event:** Determine the target audience of volunteers and consider the best way(s) to advertise your clean-up event. Is it by e-mail? Website? Post-card? Posting of a flyer on a community bulletin board and / or kiosk? An annual lake association newsletter? An advertisement in a local newspaper? TV? Radio? facebook / social media? All of the above? Remember, printed materials and postage cost money, as typically do newspaper and radio advertisements. If your group has available funds for this, that is one thing. If not, instead of



simply placing a paid advertisement in a newspaper, try reaching out to a local news reporter to see if s/he will write a story about your cleanup (or write and submit an op-ed piece). This is usually good, free, advertisement. Also determine the most appropriate time to advertise for the clean-up event. Will you be advertising only once, or multiple times before the event?

The UPRP has typically advertised clean-up events in the following manners: 1) The UPRP webpage, 2) The City of Manchester website "Calendar of Events", 3) the UPRP facebook page, and 4) E-newsletter / e-mail. Local newspapers are also always gracious to cover the event(s) in a story beforehand. The UPRP typically sends posts the clean-up events on the website, and sends out an e-mail approximately three weeks in advance of the cleanup. The UPRP will then send weekly e-mails.

C. Create an E-Mail Distribution List: If you don't already have an e-mail distribution list, consider creating one. This may include names and e-mail addresses of lake association members, conservation commissioners, selectmen, municipal employees / department heads and others you know who may be interested. You can add to this with each clean-up event your group coordinates. If you have access to Constant Contact, Mailer, Mail Chimp, or other similar e-mail platform, this may be easier and more appropriate to use. If not, e-mail is a good starting place.



The UPRP has an e-mail distribution list which consists of approximately 200 individuals consisting of city aldermen, city department heads, conservation commissioners, media contacts, active school groups and other environmental organizations, and former volunteers. With every e-mail sent, an option is sent to opt-out of receiving e-mails by having a name and e-mail address removed from the list. This list is updated at least twice a year.

D. Before You Mail, Post, (or Hit the Send Button): Before you mail or post your flyer, or hit the send button to your e-mail distribution list, be sure to include the Who, What, Where, When, Why, and How to ensure all information is readily available. Why are you seeking volunteers? Who are you seeking as volunteers? What tasks are you seeking of volunteers? Where (general location and specific meeting location) are you seeking volunteers? When (date / time) are you seeking volunteers? Is there a rain date? How will the tasks be conducted? What should the volunteers wear or bring? What will be provided? Are you requesting an RSVP? For more information, who should they contact? Prepare your volunteers by letting them know what time to arrive, what to wear (clothes that can get dirty or wet, long pants, work gloves, boots or sturdy shoes, etc.), what to bring (sunscreen, insect repellent, water) and what to do in case of bad weather (rain date or cancellation information / phone number).



For Example: Seeking volunteers of all ages to assist in an annual trash clean-up at Black Brook and Blodgett Park in Manchester on Saturday, April 23, 2016 from 9:00AM – 11:00AM. Volunteers will partner to clean the park and skirt the edges of the brook and wetland complex to remove accumulated trash. Please dress appropriately for weather as no rain date is scheduled. Latex gloves and trash bags will be provided, but please wear knee-boots, or hip-waders if you have them. No RSVP necessary. For more information, please visit www.manchesternh.gov/urbanponds or contact Jen Drociak at email@gmail.com or (603) ### - ####. We look forward to seeing you there!

Step 6: Conduct Your Clean-Up Event

A. Arrive Early: Consider arriving 15 minutes to one hour earlier than your volunteers so that you can set up at your check in location. Consider setting up the following: "Clean-Up Attendance Sheet", water and / or refreshments, first aid and safety, trash bags and clean-up supplies, organizational information (flyers, fact sheets, reports, etc.). Consider also walking around the location(s) to identify any new trash and / or safety concerns that may have accrued / arisen since your last visit.

F. Provide Necessary Supplies to Your Volunteers: Ensure your volunteers have ample supplies for the duration of the clean-up event. If they did not bring their own work gloves, request that they take two pairs of Latex gloves (in case one pair rips), and more than one trash bag, depending on the designated location(s). If your group is also removing yard waste, provide your volunteers with rakes and lawn-waste bags. Request that they return any unused pair of gloves, trash bags, and any supplies to you at the end of the clean-up event. Consider also leaving supplies out in a designated location along with the “Clean-Up Attendance Sheet” for volunteers who may show up late.



Many of the UPRP bring their own work gloves. We then issue two pairs of Latex gloves to each volunteer as well as multiple trash bags, depending on the specific area they will be cleaning up. We request that all unused supplies be returned at the end of the clean-up.

G. Provide Your Volunteers with Instructions for the Clean-Up Event: Provide your volunteers with instructions for the clean-up event such as what they will be retrieving (large trash only, all trash, etc.) what not to pick up (hypodermic needles, cigarette butts, etc.), if they are to separate trash from recycling or not (in which case they may carry two bags at once – different colors may be helpful - one for trash and one for recycling), what is considered recyclable if they are separating recycling from trash (this differs in each community and some vendors may not accept unclean / dirty recyclables from clean-up events), etc. Also provide your volunteers with safety tips and a general schedule of the clean-up event including the location to reconvene at the end and where to place trash. Ensure everyone knows there to focus their efforts and then to stop.

The UPRP typically only picks up large items, and does not typically separate trash from recycling, due to limited means. However, we have done so in the past and have provided volunteers with two trash bags – one for recycling, and one for trash.

H. Make It Fun! Play One or More Games While You’re at It! Why not make things fun while you’re out there picking up trash? Consider playing one or more games (especially if some of the volunteers are children) such as a scavenger hunt, who can find the most interesting or unusual piece of trash, who can find the largest piece of trash, who collects the most trash, etc. Consider offering a prize and / or certificate to the winner(s) of one or more of the games you play.

The UPRP has, for many years, asked volunteers to find the “Most Interesting or Unusual Piece of Trash” at each clean-up event. At the end of the clean-up, volunteers will place their found items in one location for “judging” by the coordinator(s) of the clean-up event. Certificates and / or prizes have been awarded to the winner(s), and photos have been taken. We have found some really interesting and unusual pieces of trash over the years, and have kept a list!



I. Relinquish Groups of Volunteers / Group Leader(s) to Designated Area(s): If you are separating volunteers into more than one group for your clean-up event, relinquish the groups to their designated location(s). If you don’t have a group leader for each group, relinquish them with their maps in hand. If you have a group leader be sure to introduce the volunteers in each group to their group leader before relinquishing them to their designated location(s). Remember to consider that not all locations may need the same number of volunteers.

The UPRP typically asks one or more returning volunteers if they would agree to be group leaders. Not all locations require the same amount of volunteers, however. This is decided based upon the area of the designated location(s), as well as the amount of trash to be removed in the designated location(s). For example, one small area along the shoreline may only require two volunteers, but a larger area in another location with a lot of trash may require 4-6 or more volunteers.



J. Reconvene at Initial Check-In Area at Designated Time: After the allotted period of time has elapsed for the clean-up event, reconvene at your initial check-in area. Account for all volunteers that did not sign out early.

The UPRP always meets at our initial check-in area. We then account for each group leader and group of volunteers (who did not sign out early) to ensure all have safely returned.



K. Count Full Bags of Trash (or Weigh All Trash): Count all full bags of trash that were collected and returned. If one or more bags are returned and are not considered full, consider consolidating them to make full bags of trash. That way, your measurements of “full bags” collected for this, and any other clean-up events, are consistently measured / counted. If your group has access to a scale, you consider weighing your bags of trash, and any other trash, to account for pounds of trash collected. Another option is to ask if the vendor who is charged with collecting the trash after the event can inform your group of the weight of the collection when the truck enters the scale at the weigh-station before drop-off at the refuse facility.



Since trash collected at UPRP clean-up events has not been weighed by a scale, and trash has been weighed by vendor truck only occasionally, to be consistent, we always count full bags at the site, and consolidate bags of trash that are returned not full in order to make full bags.

L. Account for and Count Other Items: Account for and count the quantity of other items of trash collected that cannot fit into bags.

The UPRP always accounts for and counts any trash that is collected that cannot be bagged. This typically includes vehicular tires, shopping carts, wood debris, construction debris, or any other items that have been illegally dumped.



M. Share the Data with Volunteers: Once you have tallied the final numbers of bags of trash and other items collected during the clean-up event, announce them to your volunteers so they know just how much trash and other debris they removed from the area, know how important their contribution of time and efforts were, and have immediate results of their work!



N. Tally Final Numbers on Clean-Up Attendance Sheet: Once you have tallied everything collected, write these numbers on your “Clean-Up Attendance Sheet”.

O. Take Photographs: To commemorate the success of your clean-up event, take a photo of the trash collected, and of the group of volunteers who helped collect it!

The UPRP always photographs the trash collected (in and out of bags), as well as takes a group photograph in front of or aside the trash collected.



P. Award a Prize, or Two, or Three: If you played one or more games during the clean-up event, consider awarding a certificate or prize to your winner(s) and photographing them with their winning piece of trash!

The UPRP has, for many years, asked volunteers to find the “Most Interesting or Unusual Piece of Trash” at each clean-up event. At the end of the clean-up, volunteers will place their found items in one location for “judging” by the coordinator(s) of the clean-up. Certificates and / or prizes have been awarded to the winner(s), and photos have been taken.



Q. Thank the Volunteers: Before parting ways, be sure to thank your volunteers for their assistance! Encourage them to volunteer again. Be sure to individually thank any special guests (aldermen / selectmen, city employees, media, etc.).

At the end of each clean-up event, the UPRP notes upcoming clean-up events in order to encourage volunteers to return for the next event.



Above Left: Volunteers at the 100th Cleanup of the Manchester Urban Ponds Restoration Program.

Above Right: Cake served to volunteers at the 100th official cleanup of the Manchester Urban Ponds Restoration Program .

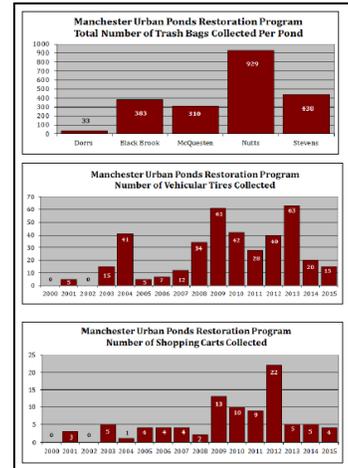
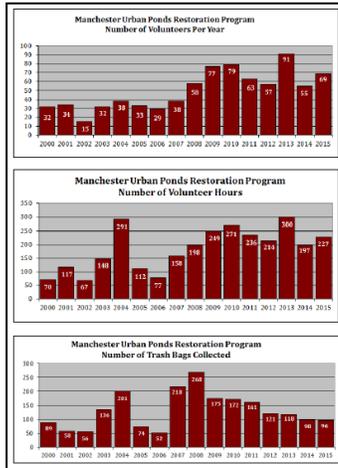
R. Consider Having a Picnic / Cookout / or Lunch: If you have the financial means, consider having a picnic / cookout / lunch afterwards to celebrate your accomplishment. Or, consider soliciting local vendors for food donations in exchange for sponsor / partnership recognition at your clean-up event. If you're not able to make or supply lunch, consider encouraging volunteers to bring a brown-bag lunch for afterwards.

Step 7: Follow Up After the Clean-Up Event

A. Update Your Electronic Records: Now is the time to transpose the information collected on the “Clean-Up Attendance Sheet” into an electronic record-retention system if you have access to one. Perhaps you have access to a database. If not, consider using a Microsoft Excel workbook / spreadsheet system to track measurements from your clean-up events. Now is also the time to update your existing e-mail distribution list with the names and e-mail addresses of those volunteers who participated in your clean-up event.

The UPRP has consistently used Microsoft Excel to track clean-up measurements. In the first worksheet of the workbook, we account for the number of our clean-up event, the location, date, hours spent at the event, numbers of bags of trash collected at the event, number of volunteers at the event, number of volunteer hours at the event, total value of volunteer time for the event, and other items retrieved at the event. For each year tracked, we created a “total” line with auto-calculations to account for the total of each year. To account for the value of volunteer time, we use figures taken from www.independentsector.org. In the second worksheet of the workbook, we account for pond cleanup attendees, where, for each clean-up event, we list the location, date, names (in alphabetical order), address, and hours at event. Similarly, for each year tracked, we created a “total” line. In the third worksheet of the workbook, we have created graphs based upon each year’s total metrics. We then transpose these graphs to a Microsoft Word document, then an Adobe PDF document, and post on our website, and at the kiosks.

Manchester Urban Ponds Restoration Pond Cleanup Measurements									
#	Location	Date	Hours	# Bags Trash Collected	# Volunteers in Attendance	# Volunteer Hours	Value of Volunteer Time (\$22.50/hr)	Other Items Retrieved	
2013									
101	Black Pond	4/30/13	2	16	10	10	\$225.00	5 tires, 1 wooden pallet, 2 large plastic containers	
102	Seawall Pond	4/30/13	2	16	11	11	\$247.50	5 tires, 1 wooden pallet, 1 television, 3 bags	
103	Wells Pond	5/4/13	3	16	14	14	\$315.00	wind socks, 3 shopping carts	
104	Manchester Pond (NHEC)	5/10/13	4	18	15	15	\$337.50	17 tires, 7 compressed buckets, 4 car tires	
105	Manchester Pond (NHEC)	5/10/13	4	18	15	15	\$337.50	20 tires (largely damaged)	
2014									
106	Black Pond	4/30/14	2	16	11	11	\$247.50	wind detritus, 2 tires, 1 bag	
107	Seawall Pond	5/3/14	3	17	14	14	\$315.00	1 tire, wood detritus, 1 bag, 1 bag, 10 debris	
108	Wells Pond (EPA)	5/4/14	3	16	14	14	\$315.00	2 tires, 1 shopping cart, 1 TV, 1 washing machine	
109	Manchester Pond (NHEC)	5/10/14	4	18	15	15	\$337.50	8 tires, 2 shopping carts, wood detritus	
110	Manchester Pond (NHEC)	5/10/14	4	18	15	15	\$337.50	12 tires, 3 shopping carts, wood detritus	
2015									
111	Black Pond	4/30/15	2	16	11	11	\$247.50	20 gallon drums, 30 gallon plastic garbage can	
112	Seawall Pond	5/3/15	3	17	14	14	\$315.00	4 tires, 1 TV, 1 TV stand, wood detritus	
113	Wells Pond	5/4/15	3	16	14	14	\$315.00	1 tire, 2 shopping carts, 1 tire frame, 1 set of	
114	Manchester Pond (NHEC)	5/10/15	4	18	15	15	\$337.50	20 gallon drums, 30 gallon plastic garbage can	
115	Manchester Pond (NHEC)	5/10/15	4	18	15	15	\$337.50	10 wooden pallets, 10 tires, 1 bag	
2015 Total									
			2095	800	800	2928.50	\$54,254.80		



B. Follow Up With an E-mail or Thank-You Note: It is always nice to follow up with your new (and / or returning) volunteers by sending them a formal personalized thank-you via e-mail or US Postal Service. Besides, who doesn't like receiving a letter in the letter box, especially in this electronic day-in-age?

The UPRP, has, on occasion, sent personalized thank-you cards in the mail. Typically, however, we send a group thank-you via e-mail and attach photographs taken at the event(s), as well as re-cap tallies from the clean-up event(s).



C. Consider Writing an Article for Your Newsletter or the Newspaper: Consider writing an article for your newsletter, if you have one, or a local newsletter or newspaper, summarizing the event with photographs and tallies from the event. Volunteers who helped out at your clean-up event will feel proud of their accomplishment and the results. This is a good way to garner publicity about your group and its event as well as garner additional volunteers in the future.

The UPRP has often written newspaper articles and / or shared summary information about the clean-up events (at the end of the season) listing sponsors / project partners and volunteers, and including photographs of volunteers at the event, via an electronic newsletter.



From 2000 - 2005 **The Manchester Urban Ponds Restoration Program** (UPRP) was part of the Supplemental Environmental Projects Plan (SEPP) which was part of an agreement between the City of Manchester, NH Department of Environmental Services, and the US Environmental Protection Agency to address combined sewers in the City. Seven (7) waterbodies in Manchester have been evaluated and monitored for restoration potential. Specific restoration projects to meet the program's goals have also been identified, funded, and completed through this project. Since 2000, the Manchester Urban Ponds Restoration Program has organized 101 clean-up events. Over the past 15 years, 800 volunteers have spent 2,298.50 hours collecting 2,093 bags of trash! This does not include the items illegally “dumped” such as shopping carts (91), tires (388), car batteries, other car parts, construction debris, and other items. In addition, the value of volunteer time spent at these clean-ups has amounted to over \$54,000 over the past 15 years! The Manchester Urban Ponds Restoration Program was awarded an EPA “Environmental Merit Award” in 2011. More information on the Manchester Urban Ponds Restoration Program can be found by visiting www.manchesternh.gov/urbanponds.



Jen Drociak lives in Manchester, NH and holds a Bachelor of Science degree in Environmental Conservation from the University of New Hampshire. She is employed with the New Hampshire Department of Environmental Services where she has worked as a program specialist for the Pollution Prevention Program, a restoration specialist for the NH Coastal Program where she established a monitoring program for pre- and post-restoration projects in NH’s salt marshes, and as the Volunteer River Assessment Program Coordinator

where she provided technical assistance to approximately 200 volunteers who collected water quality samples for surface water quality assessments on NH’s rivers and streams. Jen has also worked for the Wastewater Engineering Bureau as a grants management specialist and is currently working for the Land Resources Management Bureau as a compliance specialist. Since 2000, Jen has also been involved with the Manchester Urban Ponds Restoration Program, and has served as acting coordinator since 2006 where she largely coordinates annual clean-up events and water quality monitoring.

IDDE Implementation Timeline

Effective Date

Date

1 yr

2 yr

3 yr

4 yr

5 yr

6 yr

7 yr

8 yr

9 yr

10 yr

Annual Report

Phase I map due

Phase II map due

Mapping

Update map w/ outfalls, receiving waters, certain other structures

Update mapping information, including catchment delineations, outfalls, and infrastructure locations (pipes, manholes, catch basins) based on information collected during catchment investigations

Initial Outfall Ranking due

Updated Outfall Ranking due

Dry Weather outfall screening and sampling

Wet weather screening of outfalls and interconnections will be performed as necessary during catchment investigations

Written catchment investigation procedure due

100% problems and catchments with sewage evidence investigated

100% catchments investigated

Perform catchment investigations for Problem Outfalls and outfalls/interconnections where dry weather testing indicates sewer input

Perform catchment investigations for remaining outfalls

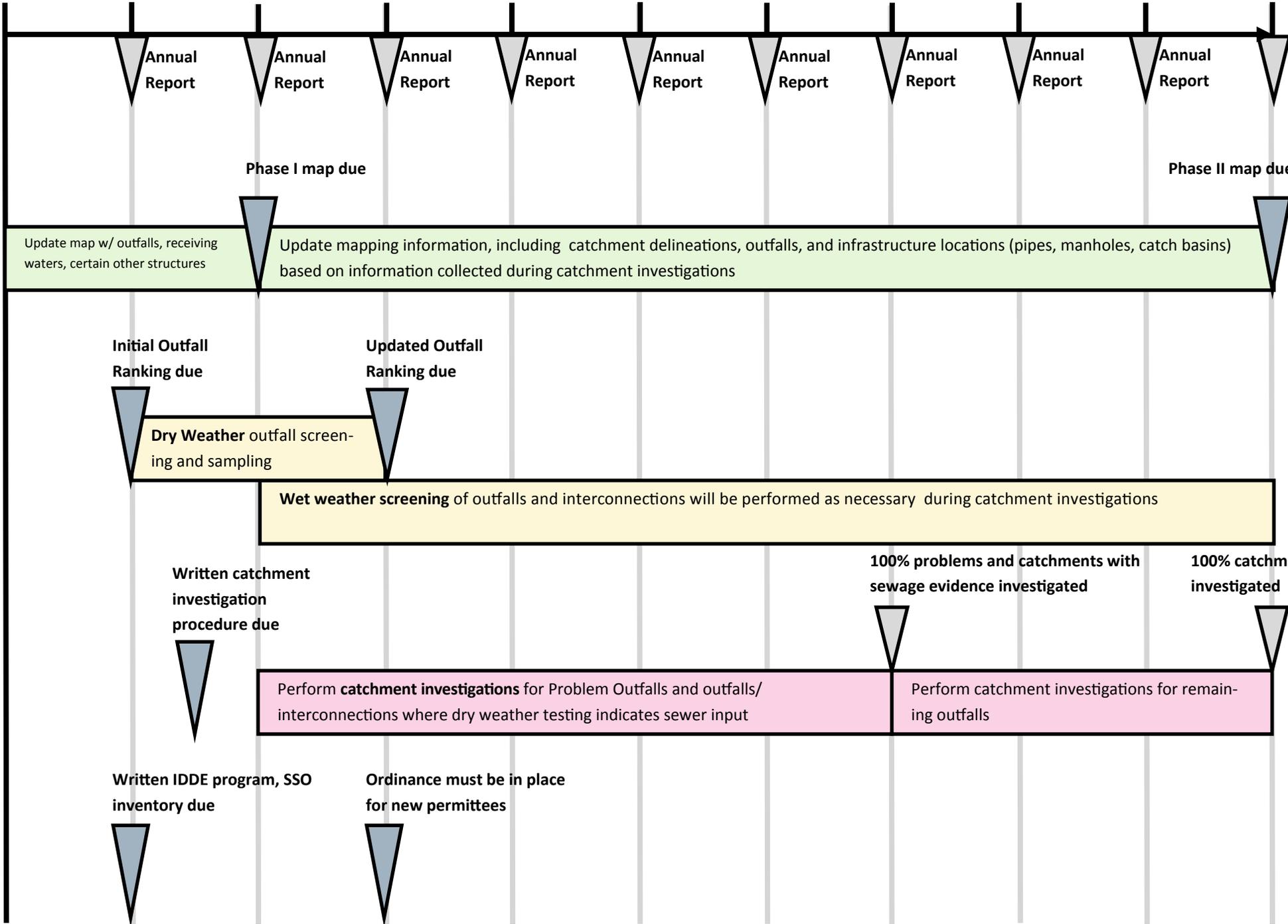
Written IDDE program, SSO inventory due

Ordinance must be in place for new permittees

Written programs

Outfall Screening

Catchment Work



Appendix F
Record Keeping

Appendix G

Plan Amendment Log

STORMWATER MANAGEMENT PLAN

AMENDMENT LOG

Tighe&Bond

Amend. No.	Description of the Amendment	Date of Amendment	Amendment Prepared by (Name/Signature)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Section 6

SWMP Certification

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

Name: _____ Title: _____

Signature: _____ Date: _____