


DRAFT Stormwater Management Plan

City of Woburn

May 2019

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Engineers | Environmental Specialists

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Section 1
Introduction

The City of Woburn is located in Middlesex County in the northeastern portion of Massachusetts, approximately 9 miles northwest of Boston. It is abutted by the Town of Wilmington to the North, Towns of Reading and Stoneham to the East, Towns of Winchester and Lexington to the South and the Town of Burlington to the West. There are approximately 0.2 square miles of water within its 12.9 square mile footprint. According to the 2010 United States (U.S.) Census, Woburn is home to approximately 38,120 residents in more than 15,524 households.

Figure 1-1 Location of Woburn, Massachusetts

Protecting the quality of Woburn's water resources, including lakes, ponds, rivers, and groundwater supplies, is a priority for the City of Woburn. Pollutants from stormwater runoff are a contributing factor to the impairment of Woburn's waterbodies, including high levels of total phosphorus and bacterial contamination. The City 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.

1.1 Purpose of this Plan

In an on-going effort to minimize stormwater impacts within Woburn, the City 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 Permit 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 Woburn to meet the terms and conditions of the permit.

The SWMP will be updated and/or modified during the permit term as the City'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 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 Woburn 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 City 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 effective. The reissued NPDES *General Permit for Stormwater Discharges from Small MS4 in Massachusetts* substantially increases stormwater management requirements and mandates specific timelines for compliance. This permit was issued on April 13, 2016. 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 reissued General Permit is intended to be more prescriptive than the 2003 General Permit, and to build upon the regulations already in place. The reissued 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.

1.2.2 Woburn's Regulated MS4 Area

The City of Woburn 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 City of Woburn 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 City character.

Urbanized Areas (also known as "regulated areas") are defined by the latest U.S. decennial 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. The 2000 census was used to determine approximately 13 square miles (100%) of Woburn was urbanized and therefore regulated under the 2003 General Permit. On March 26, 2012,

[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.

the Census Bureau published the final listing of urbanized areas for the 2010 census, which made no changes to Woburn's urbanized area. All of Woburn is regulated, as shown in Figure 1-2, and the SWMP must be implemented throughout the entire City.[2]

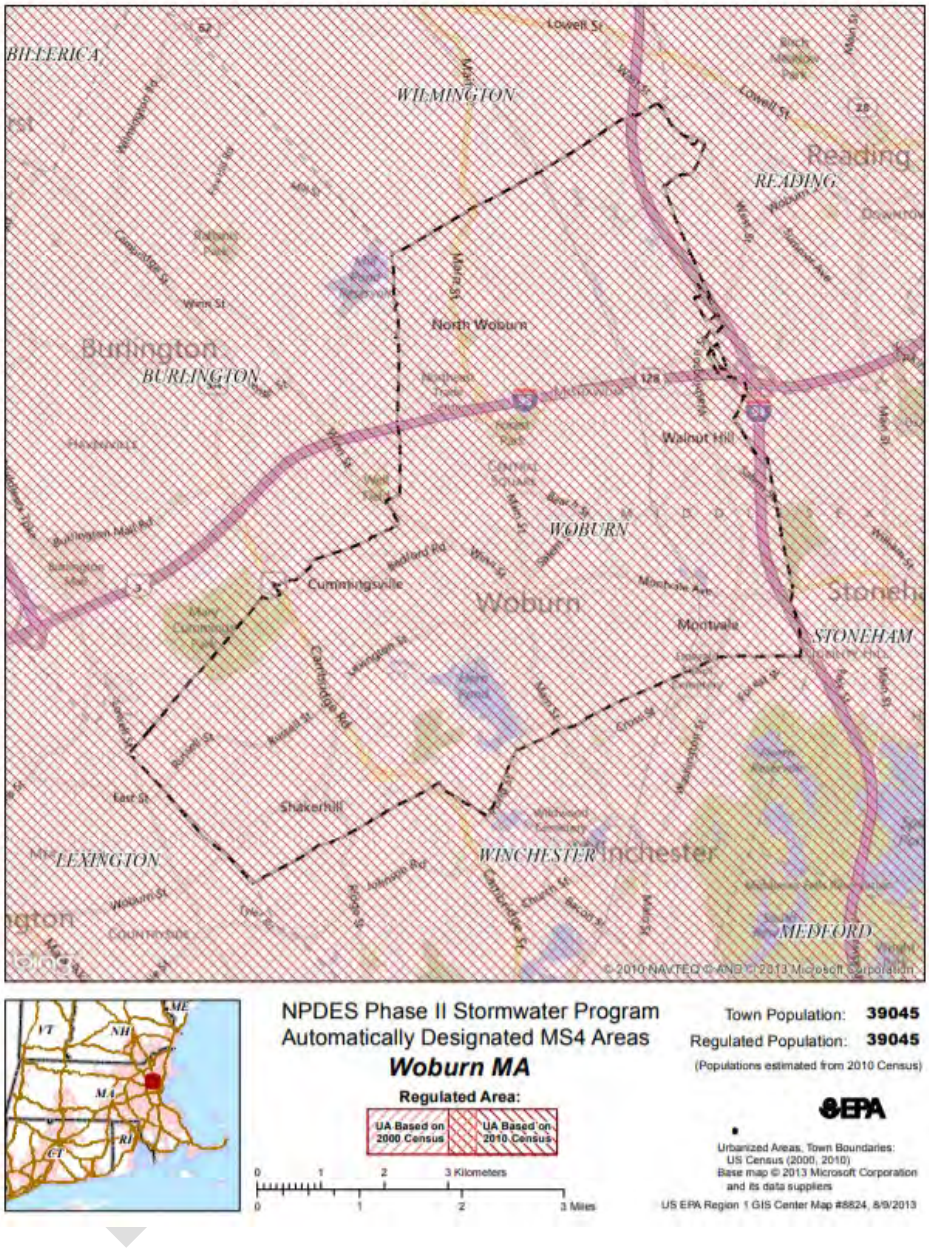


Figure 1-2 City of Woburn's Urbanized Area based on 2000 and 2010 census

1.3 Stormwater Management Program Team

Woburn's stormwater management program is managed within the Engineering Department. Currently, stormwater management tasks are carried out by various City

[2] U.S. EPA, 2014.

departments and volunteer boards, including the Engineering Department, Department of Public Works, Conservation Commission, Planning Board, Board of Health and Building Commissioner. The Superintendent of Public Works is listed as the contact person for the City's program. The City Engineer manages a number of stormwater related tasks within the program. The Mayor signs the annual reports. Appendix B identifies the titles and names of individuals on the Stormwater Management Team and can be updated as the program progresses.

1.4 Summary of Woburn's Stormwater Management Program under the 2003 Small MS4 General Permit

The City of Woburn has achieved all 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 City. The following paragraphs include brief descriptions of current practices the City undertakes as part of its Stormwater Management Program.

1.4.1 MCM 1 – Public Education and Outreach

The City has provided education on stormwater runoff, the City's stormwater management program, environmental awareness and pollution prevention activities by distributing brochures, developing a stormwater website, maintaining pet waste receptacles and holding tours of the Horn Pond Water Treatment Plant for school classes. Earth Day and Conservation Day events are held most years during the springtime, where residents can learn more about environmentally-related topics, connect with local businesses and organization and help clean or maintain local conservation areas. The City's stormwater website includes general information on stormwater, the Mystic River watershed and local environmental activities. The Mystic River Watershed Association (MyRWA) also has provided extensive education and outreach over the previous permit term, including provide educational materials for the City to distribute and visiting the public schools to inform students about stormwater runoff and its impacts on local waterbodies

1.4.2 MCM 2 – Public Involvement and Participation

The City posts notices of public meetings, which complies with State and Local public meeting notice requirements. There are opportunities for residents of all ages to participate in Woburn's stormwater management program and pollution prevention, such as recycling used oil, proper disposal of household hazardous waste and used tires, recycling and tree planting. Local organizations also participate and include opportunities for involvement in the City's stormwater management program, including Stream Teams from the Mystic River Watershed Association (MyRWA), who regularly take water samples from the Aberjona River and publish the results on their website, and Woburn DPW Engineering Department interns who mark municipal storm drains.

1.4.3 MCM 3 – Illicit Discharge and Detection Elimination

Woburn has spent considerable effort on their IDDE Program. The City has mapped catch basins, manholes, outfalls and receiving waters, satisfying 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. The City has developed an IDDE procedure, located and inventoried 743 stormwater discharge structures, 447 of which are public ("MS4") outfalls and completed dry weather screening for all public outfalls. The City also inspects new and updated sewer connections to confirm there are no illicit connections.

In 2007, Woburn adopted the drainage system ordinance *Stormwater, Illicit Discharge/Connection and Construction Site Management* which regulates illicit discharges and illegal connections to the MS4. The Superintendent of Public Works is identified as the enforcement authority.

City Staff have been trained, and are provided regular training opportunities, on illicit discharges and stormwater outfall investigations and sampling. City staff look for the presence of illicit discharges during regular operations activities. Additionally, student volunteers from the University of Massachusetts at Lowell have been trained on stormwater outfall investigations and sampling and have performed IDDE investigations alongside City staff since 2015.

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

The *Stormwater, Illicit Discharge/Connection and Construction Site Management* Ordinance adopted in 2007 also addresses construction site and post-construction stormwater management. The ordinance requires that all new development and redevelopment projects greater than 20,000 square feet (0.46 acres) of land disturbance meet stormwater management standards and implement an erosion and sedimentation control plan and long term operation and maintenance plan or face penalties. Projects of one acre or greater of land disturbance require review and approval by the City Engineering Department. In addition, any project involving the removal or filling of more than 100 cubic yards of earth must obtain a Special Permit from the Woburn City Council. The Building Commissioner and the Police Department are the enforcement authorities of this ordinance. The City Engineer administers, implements and enforces the provisions of the ordinance.

The City also regulates construction site and post-construction stormwater runoff from new and redevelopment through its Wetlands Ordinance and Subdivision Rules & Regulations. The Board of Health, Conservation Commission, Engineering Department, and Planning Board review components of proposed development/redevelopment projects and, as applicable, perform inspections during and after construction to ensure erosion controls are in place and stormwater systems are functioning as designed.

1.4.5 MCM 6 – Pollution Prevention and Good Housekeeping

The City implements Good Housekeeping Standard Operating Procedures and 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, use of a dedicated vehicle washing station, cleaning and inspection of drain system, and implementing a DPW Facility SPCC.

1.4.6 Additional Permit Requirements

Groundwater Recharge and Infiltration: Through implementation of the *Stormwater, Illicit Discharge/Connection and Construction Site Management* ordinance, Wetlands Protection Ordinance, and Zoning Code, the City evaluates site conditions relative to stormwater infiltration. Additionally, the City of Woburn Zoning Code includes infiltration design requirements in the Groundwater Protection District which promote surface infiltration and require artificial recharge when lot impervious area exceeds specific percentages.

Public Drinking Water Supply Requirements: The City of Woburn Zoning Code ensures adequate drinking water quality and quantity, preserves and protects drinking water supplies, conserves natural resources, and prevents contamination of the environment. The City considers water supply sources (e.g. Horn Pond) and protection areas a priority for stormwater management, particularly IDDE activities.

Record Keeping: The City of Woburn 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: Woburn's stormwater program is addressing many of the current requirements for discharges to impaired waterbodies. Through implementation of its current stormwater program, the City is addressing the discharge of the pollutants of concern.

1.4.7 Building on BMPs Identified in 2003 NOI

According to Section 1.10.b of the 2016 General Permit, Woburn 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 2016 General Permit. Appendix C 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).

1.5 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 City of Woburn is located within Middlesex County, Massachusetts.

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

  The population of Woburn is 38,120 according to the 2010 Census, the MS4 is not within a designated County, and the City 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 City of Woburn, based on 2000 and 2010 census listings. Woburn is fully within an urbanized area.

1.6 Special Eligibility Determinations

1.6.1 Endangered Species

On behalf of the City of Woburn, 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 City of Woburn meets **Criterion C**, where it has been determined that the City's 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 US Fish and Wildlife

Service. Refer to Appendix D of the SWMP for supporting information, including the US Fish and Wildlife Service IPaC Trust Resources Report for the project area and the Endangered Species Act Certification.

1.6.2 Historic Properties

On behalf of the City of Woburn, 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 City of Woburn meets **Criterion A**, as the discharges do not have the potential to cause effects on historic properties. Please refer to Appendix E 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 City of Woburn's regulated area downloaded from the Massachusetts Cultural Resource Information System (MACRIS).

1.7 Authorization for Woburn to Discharge Stormwater

The 2016 General Permit required a NOI be submitted within 90 days of the effective date of the permit. Woburn submitted their NOI on September 28, 2019. A copy of the NOI is included in Appendix A. Documentation of the City of Woburn's 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.

Section 2
Water Resources

2.1 Waterbody Inventory

2.1.1 Watersheds

The City of Woburn is located primarily within the Boston Harbor Watershed. Small sections of the City are located within the Shawsheen River Watershed and Ipswich River Watershed, as shown in Figure 2-1. The portion of the City within the Boston Harbor Watershed is also considered the Mystic River Watershed, which is technically a sub-basin within the Boston Harbor Watershed, and drains to the Mystic River and eventually Boston Harbor.

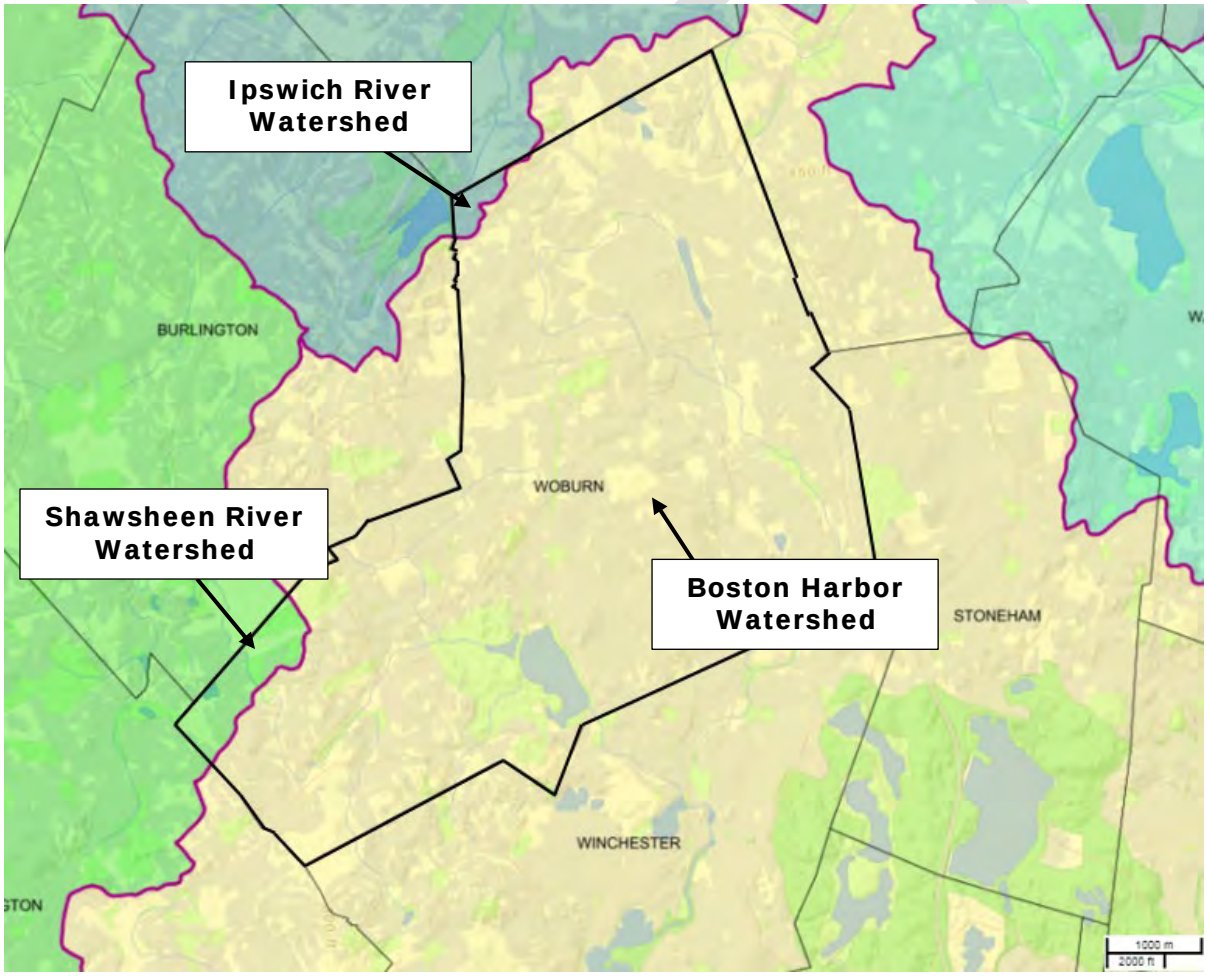


Figure 2-1 Major Watersheds in Woburn[3]

[3] Created using the MassGIS OLIVER online mapping tool.

The Boston Harbor Watershed drains to Boston Harbor and the Atlantic Ocean. The watershed is bordered by the Ipswich River Watershed to the north, the Shawsheen and Charles River Watersheds to the west, the Taunton River and South Coastal Watersheds to the south and the North Coast watershed to the north-northeast, as shown in Figure 2-2.

A small, southwestern portion of the City is within the Shawsheen Watershed, which is a fairly small watershed in eastern Massachusetts. The watershed is bordered by the SuAsCo Watershed to the west; the Ipswich River and Boston Harbor Watersheds to the east; the Merrimack River Watershed to the north; and the Charles River Watershed to the south, as shown in Figure 2-2.

A small, northwestern portion of the Woburn is within the Ipswich River Watershed, which is located in northeastern portion of Massachusetts and extends to the Atlantic Ocean. The watershed is bordered by the Shawsheen River Watershed to the west; the Parker River and Merrimack River Watersheds to the north; and the North Coastal and Boston Harbor Watersheds to the south, as shown in Figure 2-2.

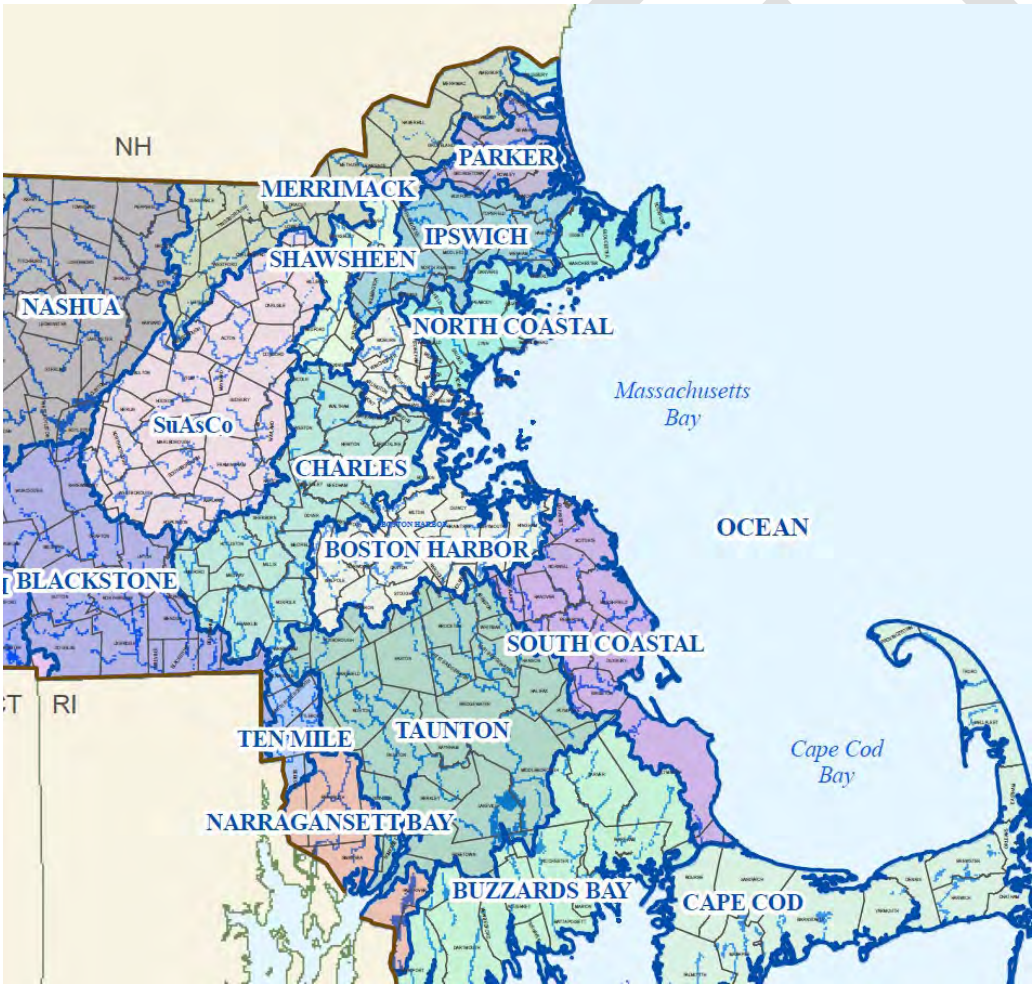


Figure 2-2 Watersheds in Eastern Massachusetts[4]

[4] Adapted from Mass.gov, 2017.

2.1.2 Waterbodies

An inventory of waterbodies to which Woburn's MS4 discharges was completed as part of preparing the NOI included in Appendix A. Table 2-1 identifies the natural drainage basins within the City of Woburn for waterbodies that are included in the NOI. For waterbodies listed in the Massachusetts 2014 Integrated List of Waters, the segment ID has been included in parentheses after the waterbody name.

Table 2-1 Natural Drainage Basins and Waterbodies within the City of Woburn, Massachusetts

Major Basin	Waterbody
Boston Harbor Watershed: Mystic	Cummings Brook (MA71-10)[5]
	Shaker Glen Brook (MA71-11)[5]
	Aberjona River (MA71-01)[5]
	Horn Pond (MA71019)[5]
	Halls Brook[5]
	Horn Pond Brook
	Middlesex Canal
	Sucker Brook[5]
	Whittemore Pond[5]
	Wetland Tributary to Little Brook
	Isolated Wetland off Courtland Circle
	Isolated Wetland off Day Circle
	Isolated Wetland off of Karen Road
	Isolated Wetland off of Kimball Court
	Isolated Wetland off of North Warren Street
	Isolated Wetland off of Pearl Street
	Isolated Wetland off of Revere Road
	Isolated Wetland off of Virginia Ave
	Isolated Wetland off of Winter Road
	Isolated Wetland off of Chandler Street
	Isolated Wetland off of Presidential Way
Ipswich River Watershed	Maple Meadow Brook (MA92-04)

2.1.3 Drinking Water

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.

The City of Woburn produces two-thirds of its water supply from five wells within the Horn Pond area and supplies the remaining one-third with water from the Massachusetts Water

[5] Wetlands and tributaries to these waterbodies are also listed in the NOI and located in the City of Woburn.

Resources Authority (MWRA). Section 15 of the City's Zoning Code prohibits activities with the potential to cause groundwater contamination within the Groundwater Protection District, including but not limited to earth removal, storage of solid waste, de-icing chemicals, animal manure and hazardous materials. A map of public drinking water supplies in Woburn and surrounding communities is shown in Figure 2-3.

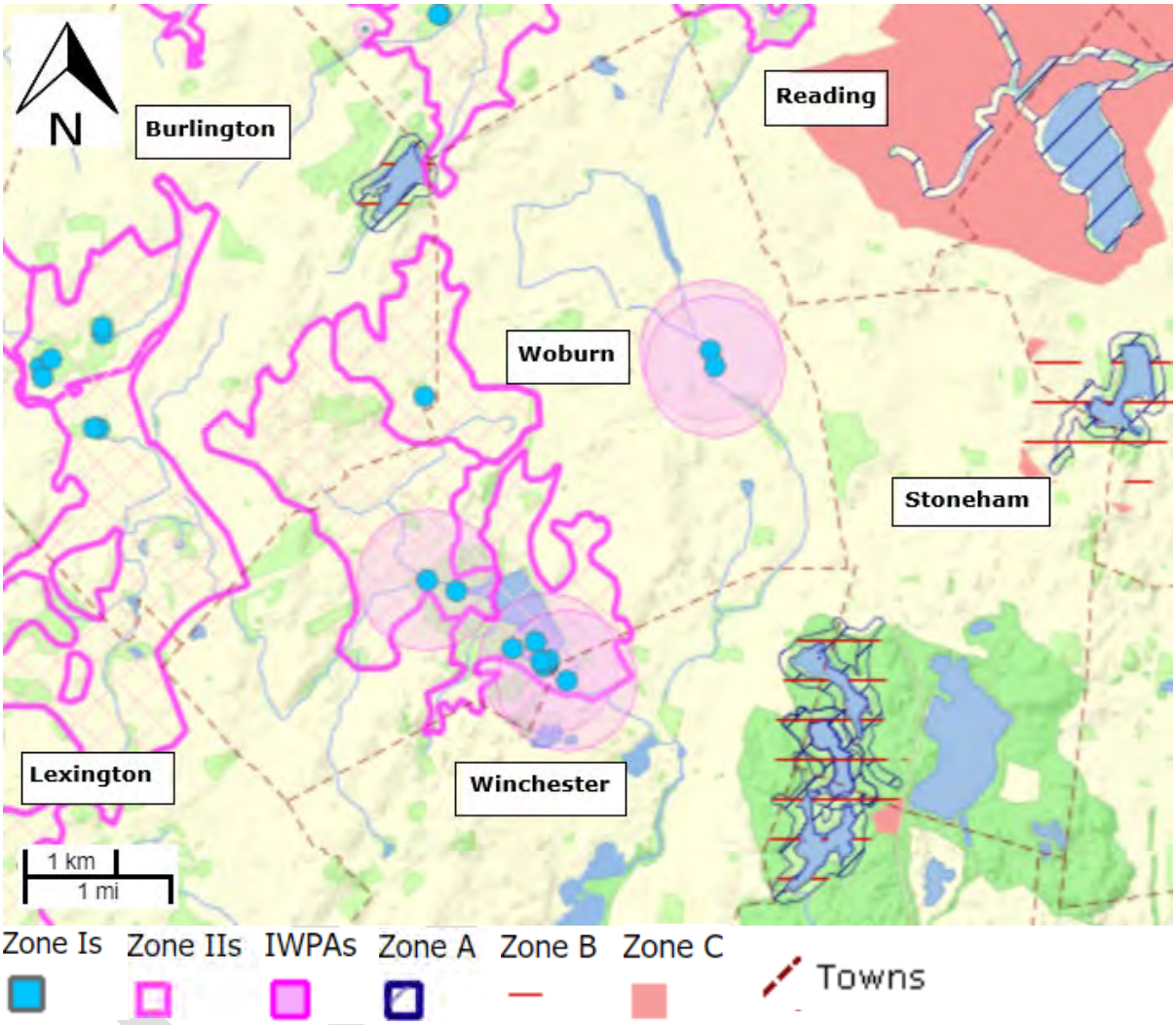


Figure 2-3 Public Drinking Water Supplies in Woburn, MA[6]

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

[6] Created using the MassGIS OLIVER online mapping tool.

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 River, Shawsheen River and Mystic River Watersheds was assessed by the Massachusetts Department of Environmental Protection, Division of Watershed Management in 2000[7], 2000[8], 2004-2008[9], respectively. See the applicable MassDEP reports for further information.

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.[10] Waterbodies identified on Integrated List within Woburn are listed in Table 2-2.

Table 2-2
Summary of 2014 Integrated List of Waters - Status of Woburn's Receiving Waters

Category 5 Waters: Waters Requiring a TMDL		
Indicator contributing to impairment:	Horn Pond MA71019	Aberjona River MA71-01
Non-native Aquatic Plants*	X	
DDT in Fish Tissue	X	

[7] MassDEP, Division of Watershed Management, "Ipswich River Watersheds 2000 Water Quality Assessment Report".
[8] MassDEP, Division of Watershed Management, "Shawsheen River Watersheds 2000 Water Quality Assessment Report".
[9] MassDEP, Division of Watershed Management, "Mystic River Watershed and Coastal Drainage Area 2004-2008 Water Quality Assessment Report".
[10] MassDEP, Bureau of Water Resources "Final Massachusetts Year 2014 Integrated List of Waters". December 2015. Accessed online at: http://www.mass.gov/eea/docs/dep/water/resources/07v5/14list2.pdf.

Category 5 Waters: Waters Requiring a TMDL (continued)		
Indicator contributing to impairment:	Horn Pond MA71019	Aberjona River MA71-01
Excess Algal Growth	X	
Dissolved Oxygen	X	X
Phosphorus (Total)	X	X
Arsenic		X
E. coli		X
Physical substrate habitat alterations*		X
Ammonia (un-ionized)		X
Aquatic macroinvertebrates bioassessments		X
Sediment bioassays- chronic toxicity freshwater		X
Turbidity		X

Category 3 Waters: No Uses Assessed	
Cummings Brook MA71-10	Shaker Glen Brook MA71-11

*TMDL not required (Non-pollutant)

Note that a draft 2016 Integrated List of Waters is available from MassDEP, which adds Pond Brook (MA71-16) as a Category 3 and places Cummings Brook and Shaker Glen Brook as Category 5 waters impaired for *E. coli*. However, as of the effective date of the General Permit, the 2016 Integrated List of Waters had not been finalized and therefore is not yet the official EPA 303(d) list.

2.2.2 Pollutants of Concern

Based on the 2014 Integrated List of Waters, the pollutants of concern for Woburn's impaired waters related to stormwater include:

- Bacteria;
- Total Phosphorus;
- Dissolved Oxygen; and
- Turbidity.

BMPs to address pollutants of concern in Woburn are described in Section 4 and more information about these pollutants and their potential sources is included in Appendix F.

2.2.3 Applicable TMDLs

Two waterbodies within the City of Woburn are identified as Category 5 waters (impaired and requiring a TMDL), as described in Section 2.5.1. No TMDL has been finalized for either waterbody.

Section 3
Best Management Practices (BMPs) to Address Minimum Control Measures (MCMs)

This section includes descriptions of each BMP included in Woburn's 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 web, direct mail, and print materials at public buildings)	Education and outreach on stormwater management topics of significance in Woburn (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	DPW / Engineering with support from MyRWA	Distribute a minimum of two (2) educational messages spaced at least a year apart	2018 (PY1)

BMP ID	BMP Media / Category	BMP Description	Targeted Audience	Responsible Department / Parties	Measurable Goal	Beginning Year of BMP Implementation
1B	Multi-media methods (including web and direct mail)	Education and outreach on stormwater management topics of significance in Woburn (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	DPW / Engineering with support from MyRWA	Distribute a minimum of two (2) educational messages spaced at least a year apart	2019 (PY2)
1C	Multi-media methods (including web and permit application guidance)	Education and outreach on stormwater management topics of significance in Woburn (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)	DPW / Engineering with support from MyRWA	Distribute a minimum of two (2) educational messages spaced at least a year apart	2018 (PY1)
1D	Multi-media methods (including web and direct mail)	Education and outreach on stormwater management topics of significance in Woburn (including pollution prevention, illicit discharges, Multi-Sector General Permit). Educational topics will include but are not limited to those in Part 2.3.2.d.iv	Industrial Facilities	DPW / Engineering with support from MyRWA	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.

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

- Information about Woburn's 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; and
- Proper disposal of swimming pool water.

The City will build upon the existing public education and outreach program to disseminate educational materials to residents via the internet, direct mailing, and/or print materials at public buildings. The City will coordinate public educational strategies with local watershed groups and take advantage of existing materials wherever possible. Section 3.1.5 includes free resources the City can take advantage of to supplement the 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.

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

- Information about Woburn's 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).
- Other topics required for impaired waterbodies and applicable TMDLs are described in Section 4.

The City will build upon the existing public education and outreach program to disseminate educational materials to businesses, institutions, and commercial facilities within the City via the internet, direct mailing, and/or print materials at public buildings. The City will coordinate public educational strategies with local watershed groups and take advantage of existing materials wherever possible. Section 3.1.5 includes free resources the City can take advantage of to supplement the 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.

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

- Information about Woburn's 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 City will build upon the existing public education and outreach program to disseminate educational materials to developers via the internet and/or attaching educational materials to permit applications. The City will coordinate public educational strategies with local watershed groups and take advantage of existing materials wherever possible. Section 3.1.5 includes free resources the City can take advantage of to supplement the 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;

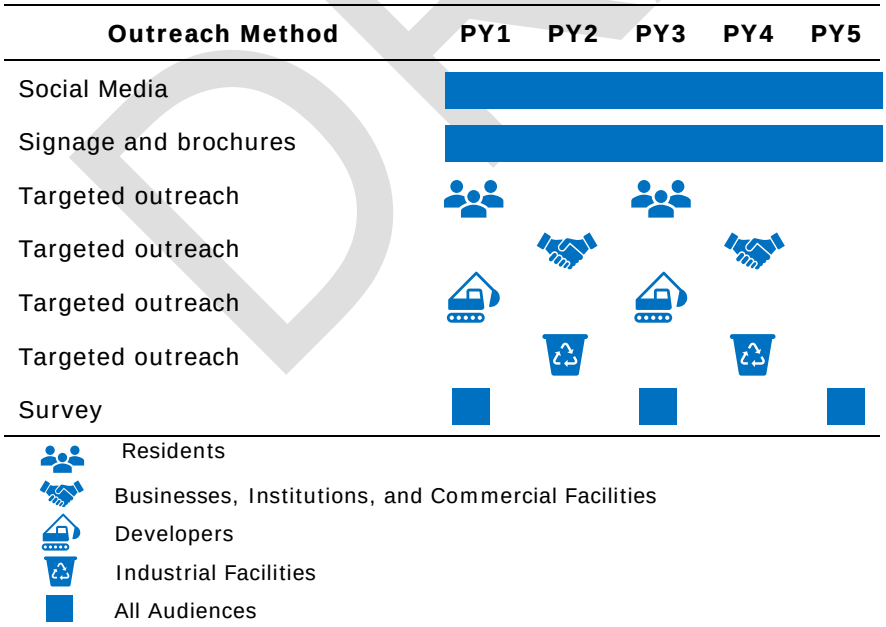
- Changing behavior over time; and
- Improving compliance with local code.

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

- Information about Woburn's 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 City will build upon the existing public education and outreach program to disseminate educational materials to industrial facilities within City via the internet and/or direct mailing. The City will coordinate public educational strategies with local watershed groups and take advantage of existing materials wherever possible. Section 3.1.5 includes free resources the City can take advantage of to supplement the program.

3.1.3 MCM 1 Implementation Schedule



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 following methods are anticipated to be used by the City to evaluate the effectiveness of the educational messages and overall education program:

- Quantify the number of each audience that is reached during direct mailings (e.g. # sent, and if any returned, #returned);
- Quantify the audience reached by social media posts related to stormwater (e.g. #hits, #retweets);
- Quantify the audience reached through catch basin markers with QR codes (e.g. # of people that visit website through scanning QR code);
- Quantify the number of meetings with Businesses related to stormwater issues and track number of attendees; and
- Track changes in behavior for specific issues addressed with education throughout the permit term (e.g., issues with erosion/sediment control during construction, pet waste bags found in catch basins, etc.) as these items arise

The above methods will be used to evaluate the effectiveness of the program, and may be modified during the permit term. Any revisions or additional methods developed after the date of this SWMP 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 Woburn can use to supplement the Public Education program.

Mystic River Watershed Association
https://mysticriver.org/the-watershed/

Think Blue Massachusetts
https://www.thinkbluemassachusetts.org/

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-citys-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

Northern Middlesex Stormwater Collaborative Resources
http://www.nmstormwater.org/resources-stormwater-collaborative

Northern Middlesex Stormwater Collaborative Education and Outreach Materials
http://www.nmstormwater.org/education-and-outreach-materials

Urban Waters
http://www.nmstormwater.org/for-municipalities

3.1.6 MCM 1 Checklist of Key Documentation

Documentation of BMP progress should be kept in Appendix H. 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 public meetings)	DPW/Engineering	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 Woburn's stormwater program (including clean up events and school programs). Specific activities, schedule, and lead departments are included in the SWMP.	DPW/ Board of Health/Conservation Commission with support from MyRWA	Ongoing compliance	2018 (PY1)
2C	Public Review	Continue Stormwater Working Group (DPW, Engineering, Conservation, Planning, Board of Health, Water/Sewer, Facilities, GIS, Schools)	Engineering	At a minimum, stormwater group will meet annually.	2018 (PY1)

3.2.2 MCM 2 Implementation Plan

BMP 2A Stormwater Management Plan Public Review

Woburn 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 City's Stormwater Program on an annual basis.

While the Engineering Department and the DPW are the responsible parties for this BMP, multiple City Departments can help aid in successful implementation, as public participation in stormwater management initiatives often crosses Departments.

This SWMP will be presented at a public meeting on June 4, 2019 to solicit input from the general public. Additionally, the draft SWMP was posted online and available to the public. Documentation of these efforts is included in Appendix H.

BMP 2B Public Participation in Stormwater Management Program

Public involvement and participation goals for BMP 2B include:

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

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

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

- Stormwater-related events with school groups;
- Hazardous waste drop off day;
- Earth Day and Conservation Day celebrations;
- Yard waste collection days; and/or
- Stream clean ups.

Appendix F includes a document with helpful tips for organizing and conducting volunteer clean-up events that Woburn may reference. The City 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 Working Group

The City has implemented a Stormwater Working Group, 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 Working Group	⟷	⟷	⟷	⟷	⟷

● = annual requirement

⟷ = ongoing requirement

3.2.4 MCM 2 Guidelines and Resources

The following links include free or low-cost resources Woburn 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 F of this SWMP

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 H. 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 Working Group meetings

3.3 MCM 3: Illicit Discharge Detection and Elimination (IDDE) Program

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

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	Complete. Continue to enforce and update if necessary.	Engineering	Track illicit discharges identified and removed.	2018 (PY1)
3B	SSO Inventory	Develop SSO inventory in accordance of permit conditions	Engineering	Complete within one (1) year of effective date of permit. Track # of SSOs identified and removed annually	2018 (PY1)
3C	Storm sewer system map	Improve map during IDDE Program implementation	Engineering	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)

BMP ID	BMP Category	BMP Description	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
3D	Written IDDE program	Update written IDDE Plan as necessary	Engineering	Complete within one (1) year of the effective date of permit and update as required	2018 (PY1)
3E	Assessment and Priority Ranking of Outfalls & Interconnections	Outfall/ Interconnection Inventory and Initial Ranking as part of BMP 3D	Engineering	Complete within one (1) year of the effective date of permit and update as necessary	2018 (PY1)
3E	Assessment and Priority Ranking of Outfalls & Interconnections	Dry Weather Outfall Screening & Sampling in accordance with IDDE Plan and permit conditions	Engineering	Complete three (3) years after effective date of permit. Track # of illicit discharges identified & volume removed. Summarize screening/ sampling results.	2018 (PY1)
3E	Assessment and Priority Ranking of Outfalls & Interconnections	Catchment Investigations according to IDDE Program and permit conditions	Engineering	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	Engineering	Train annually. Track employees trained, training topic, date/time, and materials presented.	2018 (PY1)

3.3.2 MCM 3 Implementation Plan

BMP 3A IDDE Ordinance

The IDDE program shall include adequate legal authority to prohibit, investigate, and eliminate illicit discharges and implement enforcement procedures and actions. Woburn has adopted an ordinance entitled *Stormwater, Illicit Discharge/Connection and Construction Site Management* in January 2007. This ordinance prohibits illicit discharges to the City's drainage

system. The Building Commissioner and the Police Department serve as the enforcement agency for the ordinance.

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

BMP 3B SSO Inventory

The City 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 3C Storm Sewer System Map

A comprehensive map of Woburn's drainage system has been developed, and the City has met a large portion of the requirements of this BMP. City staff should continue to update the map as necessary to reflect newly discovered information, corrections or modifications, improved connectivity, and progress made.

BMP 3C outfall inventory is complete.

BMP 3D Written IDDE Program

Woburn will develop and implement an IDDE plan, which will include procedures and timelines developed in accordance with the 2016 General Permit. The City should continue to update and modify the Plan on an as-needed basis.

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

The City will assess and priority rank each outfall within the MS4 in terms of their potential to have illicit discharges and SSOs, and the related public health significance within three years of the effective date of the permit. Refer to Section 4 of this plan for additional prioritization criteria related to waters subject to a TMDL and public drinking water supply.

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.

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 City 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.

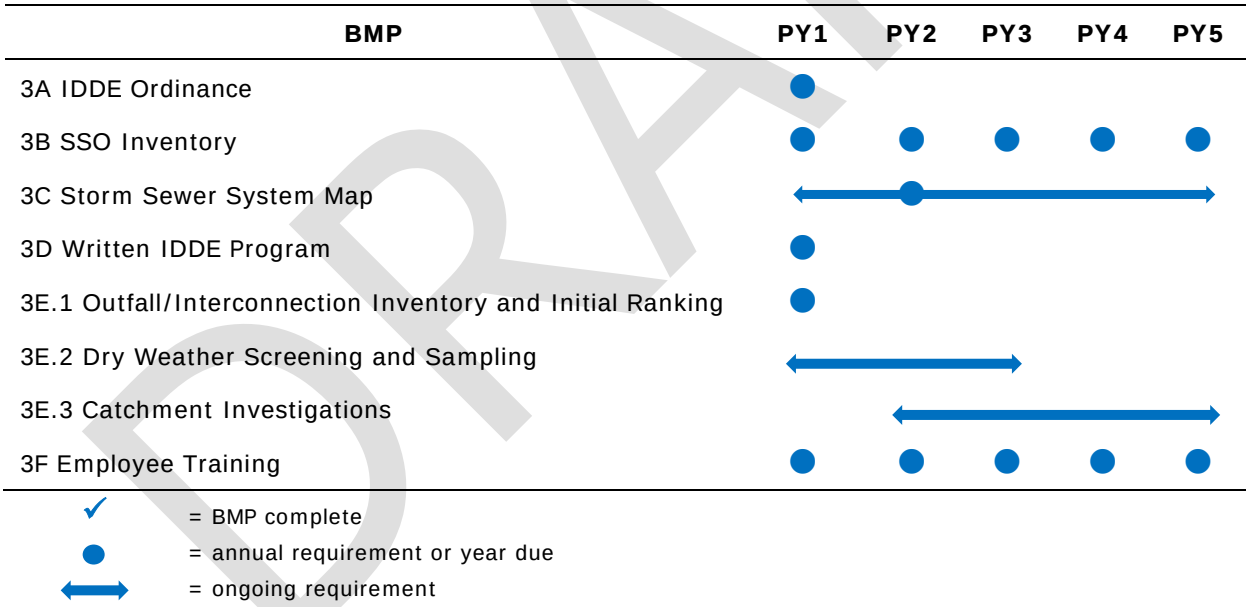
BMP 3E.3 is ongoing.

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.

3.3.3 MCM 3 Implementation Schedule

EPA's implementation timeline for the IDDE Program is available in Appendix F.



3.3.4 MCM 3 Guidelines and Resources

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

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

Woburn *Stormwater, Illicit Discharge/Connection and Construction Site Management* Ordinance
https://www.woburnma.gov/wp-content/uploads/2017/06/Woburn-Municipal-Code-Complete-11-1-2017.pdf

3.3.5 MCM 3 Checklist of Key Documentation

Documentation of BMP progress should be kept in Appendix H. The following checklist includes the required documentation for MCM 3. 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 Regulations	Ordinance complete. Modify local regulations, if necessary, to contain new MS4 provisions per section 2.3.5.	Building Commissioner/ DPW	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.	Engineering/ Planning	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, Woburn must develop and implement the following items, which will be adopted as either ordinance/regulation modifications or a new policy or procedure. Note that these items are only required for disturbances within the regulated area that are greater than or equal to one (1) acre or less than one (1) acre if that disturbance is part of a larger common plan of development or sale that would disturb one (1) or more acres.

- 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 Ordinance

The City 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. Woburn has adopted an ordinance entitled *Stormwater, Illicit Discharge/Connection and Construction Site Management* in January 2007. This ordinance provides guidance for site planning and stormwater runoff control during construction and post-construction to protect local water resources from discharges. The Building Commissioner and Police Department serve as the enforcement agency for the ordinance.

The City will review the existing ordinance with respect to the 2016 General Permit and modify it if needed.

BMP 4B Construction Policy and Procedures

Woburn 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 Ordinance	●				
4B Construction Policy and Procedures	●				

● = year due

3.4.4 MCM 4 Guidelines and Resources

The following links include free or low-cost resources Woburn 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

Woburn *Stormwater, Illicit Discharge/Connection and Construction Site Management Ordinance*
https://www.woburnma.gov/wp-content/uploads/2017/06/Woburn-Municipal-Code-Complete-7-2-2018.pdf

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 H. 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 Woburn's ordinances, 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 Ordinance and Regulations	Ordinance complete. Modify local regulations to contain new MS4 provisions per section 2.3.6.a of the General Permit.	Building Commissioner/ Engineering	Modify existing 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.	Engineering/ Planning	Complete report no later than (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	Engineering/ Planning	Complete report no later than (4) years of permit effective date	2020 (PY3)
5D	Retrofit Feasibility Assessment	Conduct detailed inventory of City-owned properties and rank for retrofit potential	Engineering	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 Ordinance

The City 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. Woburn has adopted an ordinance entitled *Stormwater, Illicit Discharge/Connection and Construction Site Management* in 2007 and associated regulations. This ordinance provides guidance for site planning and stormwater runoff control during construction and post-construction to protect local water resources from discharges. The Building Commissioner and Police Department serve as the enforcement agency for the ordinance.

The City will need to review the existing ordinance with respect to the 2016 General Permit and modify it if needed. Additionally, the City 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.

BMP 5B Assess Street and Parking Lot Guidelines

In accordance with General Permit Section 2.3.6.b, Woburn 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 City 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 City departments. 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, Woburn 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 City shall implement all recommendations in accordance with the schedules contained in the assessment.

BMP 5D Retrofit Feasibility Assessment

The City must identify at least five City-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 Ordinance		●			
5B Assess Street and Parking Lot Guidelines				●	
5C Assess Feasibility of Allowing Green Infrastructure				●	
5D Retrofit Feasibility Assessment				●	→

● = year due
↔ = ongoing requirement

3.5.4 MCM 5 Guidelines and Resources

The following links include free or low-cost resources Woburn 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

Woburn *Stormwater, Illicit Discharge/Connection and Construction Site Management Ordinance*
https://www.woburnma.gov/wp-content/uploads/2017/06/Woburn-Municipal-Code-Complete-7-2-2018.pdf

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 H. The following checklist includes the required documentation for MCM 5. See Section 5 of this Plan for additional record keeping information.

- ☐ Measures the City has taken to ensure adequate long-term operation and maintenance of stormwater BMPs and to require submission of as-built plans;
- ☐ Modifications to Woburn's ordinances, 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 City-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	DPW/ Engineering	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	DPW/ Engineering	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 Plan (SWPPP)	Develop and implement a SWPPP for DPW facility.	DPW/ Engineering	Complete SWPPPs within two (2) years of permit effective date, implement in following years	2019 (PY2)
6D	Operation & Maintenance Program	Implement procedures to optimize catch basin cleaning developed under BMP 6B	DPW	Track frequency and material quantity of catch basin cleaning in City. In first Annual Report and in SWMP, document plan for optimizing catch basin cleaning.	2018 (PY1)
6D	Operation & Maintenance Program	Implement procedures for street and parking lot sweeping developed under BMP 6A	DPW	Annually track number of miles cleaned or the volume or mass of material removed.	2018 (PY1)
6D	Operation & Maintenance Program	Implement procedures for use and storage of deicing materials developed under BMP 6A & 6B.	DPW	Implement program for winter road maintenance throughout permit term.	2018 (PY1)
6D	Operation & Maintenance Program	Implement procedures to inspect and maintain City-owned structural stormwater BMPs developed under BMP 6B	DPW/ Engineering	Development an inventory of City-owned BMPs in progress. 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

Woburn must develop a written City-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 will include an inventory of the municipally-owned facilities and equipment. The inventory and written program will be appended to this SWMP.

BMP 6B Operation and Maintenance Program for MS4 Infrastructure

The City shall develop a plan describing the activities and procedures used to maintain MS4 infrastructure in a timely manner to reduce the discharge of pollutants from the MS4. The written program developed under this BMP will be appended to the SWMP.

BMP 6C Stormwater Pollution Prevention Plans

The City shall prepare and implement a SWPPP for the City's DPW facility. In accordance with General Permit Section 2.3.7.b, Woburn must develop and implement a SWPPP for other City-owned or operated waste handling facilities where pollutants are exposed to stormwater. 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 City 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% fill, the City can reduce the frequency of cleanings. If a catch basin is more than 50% full during two consecutive cleanings/inspections, the City 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.

BMP 6D.2 Street Sweeping

Establish and implement procedures for sweeping and/or cleaning streets and City-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 City must sweep at least once per year or develop a targeted inspection and sweeping plan for those streets.

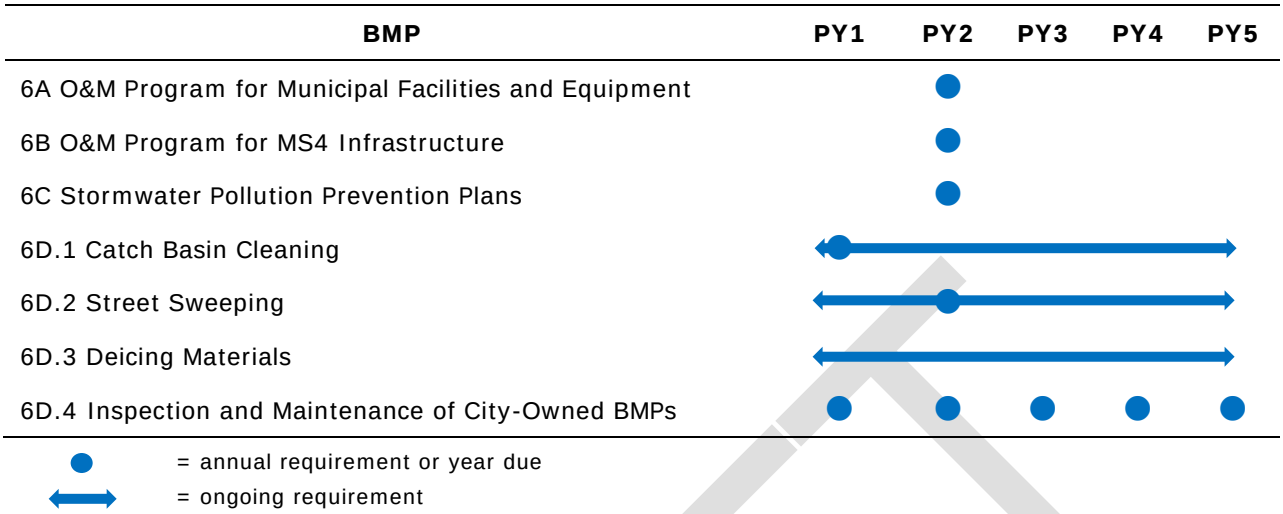
BMP 6D.3 Deicing Materials

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

BMP 6D.4 Inspection and Maintenance of City-Owned BMPs

The City 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 City-owned or operated stormwater BMPs, such as detention ponds and swales. The inventory should be developed within two (2) years of the permit effective date, per Section 2.3.4.5.a of the General Permit. All City-owned water quality BMPs must be inspected annually at a minimum. Note that drainage manholes and catch basins are not considered stormwater treatment structures for this BMP (structure maintenance procedures will be developed and implemented under BMPs 6B and 6D-1).

3.6.3 MCM 6 Implementation Schedule



3.6.4 MCM 6 Guidelines and Resources

The following links include free or low-cost resources Woburn can use to supplement the Good Housekeeping and Pollution Prevention program.

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 H. 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, two surface waterbodies, the Aberjona River and Horn Pond, within Woburn were identified in the 2014 Integrated List of Waters as Category 5 waters needing a TMDL. However, no final TMDLs have been established for the impairments.

Horn Pond is impaired for non-native aquatic plants, DDT in Fish Tissue, excess algal growth, dissolved oxygen and total phosphorus. Per Appendix H of the General Permit, the City must comply with the additional requirements listed in 4.1.2 below to address total phosphorus in their stormwater discharges, however no BMPs are required to address the other listed impairments.

The Aberjona River is impaired for dissolved oxygen, total phosphorus, *E. coli*, physical substrate habitat alterations, ammonia (un-ionized), aquatic macroinvertebrate bioassessments, sediment bioassays – chronic toxicity, and turbidity. Per Appendix H of the General Permit the City must comply with the additional requirements listed in 4.1.1, 4.1.2 and 4.1.3 below to address bacteria, total phosphorus and solids in their stormwater discharges, respectively. No additional BMPs are required to address the other listed impairments.

4.1.1 Enhanced BMPs for Bacteria or Pathogens

General Permit Part 2.3.2: Public Education and Outreach

Woburn shall supplement the residential public education program with an annual message about the proper management of pet waste, including noting any existing ordinances where appropriate, and disseminating educational materials to dog owners at the time of issuance or renewal of a dog license. Education materials shall describe the detrimental impacts of improper management of pet waste, requirements for waste collection and disposal, and penalties for non-compliance.

The City shall also provide information to owners of septic systems about proper maintenance in any catchment that discharges to a waterbody impaired for bacteria or pathogens (i.e., Aberjona River).

General Permit Part 2.3.4: Illicit Discharge

Woburn shall implement the IDDE program required by the General Permit and described in Section 3.3 of this SWMP. Additionally, catchments draining to any waterbody impaired for bacteria or pathogens shall be designated either Problem Catchments or High Priority in implementation of the IDDE program.

4.1.2 Enhanced BMPs for Total Phosphorus

General Permit Part 2.3.2: Public Education and Outreach

Woburn shall supplement the residential and business/commercial/institution public education program with an annual message about various topics, including:

- Spring – the proper use and disposal of grass clippings and encouraging the proper use of slow-release and phosphorus-free fertilizers;
- Summer – the proper management of pet waste, including noting any existing ordinances where appropriate; and
- Fall – the proper disposal of leaf litter.

General Permit Part 2.3.6: Stormwater Management in New Development and Redevelopment

Woburn's Stormwater, Illicit Discharge/Connection and Construction Site Management Ordinance shall include requirements that new development and redevelopment stormwater management BMPs be optimized for phosphorus removal. Additionally, the City's retrofit inventory developed under BMP 5D shall consider BMPs that infiltrate stormwater when possible.

General Permit Part 2.3.7: Good House Keeping and Pollution Prevention for Permittee Owned Operations

The City shall establish a program to properly manage grass cuttings and leaf litter on City-owned properties, including prohibiting blowing organic waste onto impervious surfaces. Woburn shall also increase street sweeping to a minimum of two occurrences per year, once in the spring and at least once in the fall.

Phosphorus Source Identification Report

Within four years of the permit effective date, the City must complete a Phosphorus Source Identification Report that includes the following components:

- Calculation of total MS4 area draining to the water quality limited receiving water segments or their tributaries, including updated mapping and catchment delineations completed under the IDDE Program;
- All screening and monitoring results targeting the receiving water segment(s);
- Impervious area and directly connected impervious area for the target catchment;
- Identification, delineation and prioritization of potential catchments with high phosphorus loading; and
- Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during redevelopment, including the removal of impervious area.

Potential Structural BMPs

Within five years of the permit effective date, the City must evaluate all City-owned properties identified as presenting retrofit opportunities or areas for structural BMP installation under the Good Housekeeping Program or in the Phosphorus Source Identification Report that are within the drainage area of the water quality limited water or its tributaries. The evaluation shall include:

- The next planned infrastructure, resurfacing, or redevelopment activity planned for the property (if applicable) OR planned retrofit date;
- The estimated cost of redevelopment or retrofit BMPs; and
- The engineering and regulatory feasibility of redevelopment or retrofit BMPs.

The City must also provide a list of planned structural BMPs and a plan and schedule for implementation. At least one structural BMP must be installed as a "demonstration project" within a catchment with high phosphorus load potential within six years of the permit effective date.

The estimated phosphorus removal by structural BMPs installed in Woburn's regulated area must be tracked.

4.1.3 Enhanced BMPs for Solids

General Permit Part 2.3.6: Stormwater Management in New Development and Redevelopment

Stormwater management systems designed on commercial and industrial land that drains to the water quality limited waterbody shall incorporate designs that allow for shutdown and containment where appropriate to isolate the system in the event of an emergency spill or other unexpected event. EPA also encourages the City to require any stormwater management system designed to infiltrate stormwater on commercial or industrial sites to provide the level of pollutant removal equal to or greater than the level of pollutant removal provided through the use of biofiltration of the same volume of runoff to be infiltrated, prior to infiltration.

General Permit Part 2.3.7: Good House Keeping and Pollution Prevention for Permittee Owned Operations

The City shall:

- Increase street sweeping frequency of all municipally-owned streets and parking lots to target areas with potential for high pollutant loads. This may include, but is not limited to, increased street sweeping frequency in commercial areas and high-density residential areas, or drainage areas with a large amount of impervious area.
- Prioritize inspection and maintenance for catch basins to ensure that no sump is more than 50 percent full. Clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings.
- Annually report on the street sweeping schedule to target high pollutant loads.

Section 5
Program Evaluation, Record Keeping, and Reporting

5.1 Program Evaluation

The City 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 City 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 Woburn 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 City will submit annual reports each year of the Small MS4 permit term, due ninety days from the close of each 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 H 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.*
- *Additional requirements in part 3.0 pertaining to public drinking water supplies. These requirements should be addressed in MCMs 5 and 6, discussed in Sections 3.5 and 3.6, respectively. Public drinking water supplies are prioritized as part of the IDDE program, discussed in Section 3.3.*

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 City 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 City may update or revise the SWMP as needed as the City'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 City 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 (see Appendix I).

Section 6
SWMP Certification

All reports, including SWPPPs, inspection reports, annual reports, monitoring reports, reports on training and other information required by this permit must be signed by the Mayor of Woburn or a duly authorized representative.

If the City determines it to be prudent in the future, per Appendix B, Section B.11 of the General Permit, the City can delegate an authorized representative to sign the SWMP, Annual Reports, SWPPPs and other documents prepared under the permit. The authorization must be made in writing by the Mayor and specify the representative, in accordance with Appendix B, Section B.11.

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: _____

Appendix A

Notice of Intent, Outfall Map and
Authorization to Discharge Letter from EPA

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

Part I: General Conditions

General Information

Name of Municipality or Organization: City of Woburn

State: MA

EPA NPDES Permit Number (if applicable): MAR041073

Primary MS4 Program Manager Contact Information

Name: John (Jay) Duran III, P.E.

Title: DPW Superintendent

Street Address Line 1: Department of Public Works

Street Address Line 2: 50 North Warren Street

City: Woburn

State: MA

Zip Code: 01801

Email: jduran@cityofwoburn.com

Phone Number: (781) 897-5980

Fax Number: (781) 897-5859

Other Information

Stormwater Management Program (SWMP) Location (web address or physical location, if already completed): Final SWMP will be at the DPW and online: https://www.woburnma.gov/government/public-works/

Eligibility Determination

Endangered Species Act (ESA) Determination Complete? Yes

Eligibility Criteria (check all that apply): ☐ A ☐ B ☒ C

National Historic Preservation Act (NHPA) Determination Complete? Yes

Eligibility Criteria (check all that apply): ☒ A ☐ B ☐ C

☑ Check the box if your municipality or organization was covered under the 2003 MS4 General Permit

MS4 Infrastructure (if covered under the 2003 permit)

Estimated Percent of Outfall Map Complete? *(Part II, III, IV or V, Subpart B.3.(a.) of 2003 permit)*: 100%

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

Web address where MS4 map is published: https://www.mapsonline.net/woburnma/

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

Regulatory Authorities (if covered under the 2003 permit)

Illicit Discharge Detection and Elimination (IDDE) Authority Adopted? *(Part II, III, IV or V, Subpart B.3.(b.) of 2003 permit)*: Yes

Effective Date or Estimated Date of Adoption (MM/DD/YY): 01/22/07

Construction/Erosion and Sediment Control (ESC) Authority Adopted? *(Part II,III,IV or V, Subpart B.4.(a.) of 2003 permit)*: Yes

Effective Date or Estimated Date of Adoption (MM/DD/YY): 01/22/07

Post- Construction Stormwater Management Adopted? *(Part II, III, IV or V, Subpart B.5.(a.) of 2003 permit)*: Yes

Effective Date or Estimated Date of Adoption (MM/DD/YY): 01/22/07

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

Part II: Summary of Receiving Waters

Please list the waterbody segments to which your MS4 discharges. For each waterbody segment, please report the number of outfalls discharging into it and, if applicable, any impairments.

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

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

Waterbody segment that receives flow from the MS4	Number of outfalls into receiving water segment	Chloride	Chlorophyll-a	Dissolved Oxygen/ DO Saturation	Nitrogen	Oil & Grease/ PAH	Phosphorus	Solids/ TSS/ Turbidity	E. coli	Enterococcus	Other pollutant(s) causing impairments
Aberjona River MA71-01	37	☐	☐	☒	☐	☐	☒	☒	☒	☐	Physical substrate habitat alterations, Ammonia (Un-ionized), Aquatic Macroinvertebrate Bioassessments, Arsenic, Sediment Bioassays -- Chronic Toxicity Freshwater
Wetland/Tributary to Aberjona River MA71-01	16	☐	☐	☒	☐	☐	☒	☒	☒	☐	Physical substrate habitat alterations, Ammonia (Un-ionized), Aquatic Macroinvertebrate Bioassessments, Arsenic, Sediment Bioassays -- Chronic Toxicity Freshwater
Cummings Brook MA71-10	33	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetland/Tributary to Cummings Brook MA71-10	10	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Cummings Brook	14	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetland/Tributary to Cummings Brook	3	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Halls Brook	14	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetland/Tributary to Halls Brook	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Horn Pond MA71019	24	☐	☐	☒	☐	☐	☒	☐	☐	☐	Non-Native Aquatic Plants, DDT in Fish Tissue, Excess Algal Growth
Wetland/Tributary to Horn Pond MA71019	3	☐	☐	☒	☐	☐	☒	☐	☐	☐	Non-Native Aquatic Plants, DDT in Fish Tissue, Excess Algal Growth
Horn Pond Brook	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Maple Meadow Brook MA92-04	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	Low flow alterations
Middlesex Canal	8	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Shaker Glen Brook MA71-11	10	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetland/Tributary to Shaker Glen Brook MA71-11	19	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Shaker Glen Brook	7	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetland/Tributary to Shaker Glen Brook	25	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Sucker Brook	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	

Waterbody segment that receives flow from the MS4	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
Wetland/Tributary to Sucker Brook	3	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Unnamed Tributary	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetland/Tributary to Unnamed Tributary	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Whittemore Pond	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetland/Tributary to Whittemore Pond	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Wetland/Tributary to Little Brook	9	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Courtland Circle	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Day Circle	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Karen Road	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Kimball Court	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of North Warren Street	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Pearl Street	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Revere Road	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Virginia Avenue	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Winter Road	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Unnamed Pond off of Chandler Street	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Unnamed Pond off of Presidential Way	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Outside Receiving	190	☐	☐	☐	☐	☐	☐	☐	☐	☐	

Click to lengthen table

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

Part III: Stormwater Management Program Summary

Identify the Best Management Practices (BMPs) that will be employed to address each of the six Minimum Control Measures (MCMS). For municipalities/organizations whose MS4 discharges into a receiving water with an approved Total Maximum Daily Load (TMDL) and 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 web, social media, and print materials at public buildings)	Education and outreach on stormwater management topics of significance in Woburn (including 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	DPW with support from MyRWA	Distribute a minimum of two (2) educational messages spaced at least a year apart	2018 (PY1)
1B	Multi-media methods (including web and direct mail)	Education and outreach on stormwater management topics of significance in Woburn (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	DPW with support from MyRWA	Distribute a minimum of two (2) educational messages spaced at least a year apart	2019 (PY2)

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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 permit application guidance)	Education and outreach on stormwater management topics of significance in Woburn (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)	DPW/ Conservation Commission/ Planning/ Building Commissioner	Distribute a minimum of two (2) educational messages spaced at least a year apart	2018 (PY1)
1D	Multi-media methods (including web and direct mail)	Education and outreach on stormwater management topics of significance in Woburn (including pollution prevention, illicit discharges, Multi-Sector General Permit). Educational topics will include but are not limited to those in Part 2.3.2.d.iv	Industrial Facilities	DPW with support from MyRWA	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)	DPW/Engineering	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 Woburn's stormwater program (including clean up events and activities with school age children). Specific activities, schedule, and lead departments are included in the SWMP.	DPW/Board of Health/Conservation Commission with support from MyRWA	Ongoing compliance	2018 (PY1)
2C	Public Review	Continue Stormwater Working Group (DPW, Engineering, Conservation, Planning, Board of Health, Water/Sewer, Facilities, GIS, Schools)	Engineering	At a minimum, stormwater working group will meet annually.	2018 (PY1)

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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	Complete. Continue to enforce and update if necessary.	Engineering	Track illicit discharges identified and removed.	2018 (PY1)
3B	SSO Inventory	Develop SSO inventory in accordance with permit conditions	Engineering	Complete within one (1) year of effective date of permit. Track # of SSOs identified and removed annually	2018 (PY1)
3C	Storm sewer system map	Improve map during IDDE Program implementation	Engineering	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	Update written IDDE Plan as necessary	Engineering	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.	Engineering	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.	Engineering	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	Engineering	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	Engineering	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 Regulations	Ordinance complete. Modify local regulations, if necessary, to contain new MS4 provisions per section 2.3.5.	Building Commissioner/ DPW	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.	Engineering/ Planning	Review current procedures and modify if necessary within one (1) year of permit effective date	2018 (PY1)

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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 Regulations	Ordinance complete. Modify local regulations to contain new MS4 provisions per section 2.3.6.a. of the General Permit.	Building Commissioner/ Engineering	Modify existing 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.	Engineering/ Planning	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	Engineering/ Planning	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 City-owned properties and rank for retrofit potential	Engineering	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	DPW/Engineering	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	DPW/Engineering	Complete two (2) years after permit effective date, implement in following years	2019 (PY2)
6C	Stormwater Pollution Prevention Plan (SWPPP)	Develop and implement a SWPPP for DPW facility.	DPW/Engineering	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	DPW	Track frequency and material quantity of catch basin cleaning. 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 6A & 6B	DPW	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 6A & 6B	DPW	Implement program for winter road maintenance throughout permit term.	2018 (PY1)
6D-4	Operation & Maintenance Program	Implement procedures to inspect and maintain City-owned structural stormwater BMPs developed under BMP 6B	DPW/Engineering	Development of inventory of City-owned BMPs in progress. Report on inspection and maintenance conducted annually.	2018 (PY1)

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

Part III: Stormwater Management Program Summary (continued)

Actions for Meeting Total Maximum Daily Load (TMDL) Requirements

Use the drop-down menus to select the applicable TMDL, action description to meet the TMDL requirements, and the responsible department/parties. If no options are applicable, or more than one, **enter your own text to override drop-down menus.**

Applicable TMDL	**Action Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)

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

Part III: Stormwater Management Program Summary (continued)

Actions for Meeting Requirements Related to Water Quality Limited Waters

Use the drop-down menus to select the pollutant causing the water quality limitation and enter the waterbody ID(s) experiencing excursions above water quality standards for that pollutant. Choose the action description from the dropdown menu and indicate the responsible party. If no options are applicable, or more than one, **enter your own text to override drop-down menus.**

Pollutant	Waterbody ID(s)	Action Description	Responsible Department/Parties (enter your own text to override the drop down menu)
Phosphorus	Aberjona River MA71-01	Adhere to requirements in part II of Appendix H	Engineering
Phosphorus	Horn Pond MA71019	Adhere to requirements in part II of Appendix H	Engineering
E. Coli	Aberjona River MA71-01	Adhere to requirements in part III of Appendix H	Engineering
Turbidity	Aberjona River MA71-01	Adhere to requirements in part V of Appendix H	Engineering

Part IV: Notes and additional information

Use the space below to indicate the part(s) of 2.2.1and 2.2.2 that you have identified as not applicable to your MS4 because you do not discharge to the impaired water body or a tributary to an impaired water body due to nitrogen or phosphorus. Provide all supporting documentation below or attach additional documents if necessary.
Also, provide any additional information about your MS4 program below.

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 will describe 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 City of Woburn meets Criterion C. The City's stormwater discharges and discharge related activities will have no affect on listed species or critical habitat. The City 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 City of Woburn meets Criterion A. The City's stormwater discharges do not have the potential to cause effects on historic properties. The City will consult with the State Historic Preservation Officer as needed during the permit term.

4. 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 will be included in the City'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: Scott Galvin

Title: Mayor

Signature:

Date: 9/27/2018

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

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

Outfalls and Receiving Waterbodies

Outfalls

Receiving Waterbody

- Aberjona River MA71-01
- Wetland/Tributary to Aberjona River MA71-01
- Cummings Brook MA71-10
- Wetland/Tributary to Cummings Brook MA71-10
- Cummings Brook
- Wetland/Tributary to Cummings Brook
- Halls Brook
- Wetland/Tributary to Halls Brook
- Horn Pond MA71019
- Wetland/Tributary to Horn Pond MA71019
- Horn Pond Brook
- Maple Meadow Brook MA92-04
- Middlesex Canal
- Outside Receiving
- Shaker Glen Brook
- Wetland/Tributary to Shaker Glen Brook
- Shaker Glen Brook MA71-11
- Wetland/Tributary to Shaker Glen Brook MA71-11
- Sucker Brook
- Wetland/Tributary to Sucker Brook
- Unnamed Pond off of Presidential Way
- Unnamed Tributary
- Wetland/Tributary to Unnamed Tributary
- Whittemore Pond
- Wetland/Tributart to Whittemore Pond
- Wetland/Tributary to Little Brook
- Unnamed Isolated Wetland

LEGEND

- Major Drainage Basin
- Subbasin
- Urban Area 2000
- Urban Area 2010 Census

MassDEP Waterbodies

- 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

Flood Zone Designations

- 100 Year Flood Zone
- Town Boundary

Water Body Segments - Rivers

Category

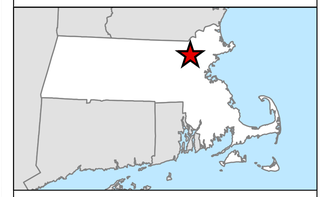
- 2 - Attaining some uses; other uses not assessed
- 3 - No uses assessed
- 4A -Impaired - TMDL is completed
- 4C - Impairment not caused by a pollutant
- 5 - Impaired - TMDL required

Water Body Segments - Lakes, Estuaries

Category

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

LOCUS MAP



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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 Woburn: Outfalls

Notice of Intent
Woburn, Massachusetts

September 2018

Tighe&Bond
Engineers | Environmental Specialists

BILLERICA
WILMINGTON
READING
BEDFORD
BURLINGTON
STONEHAM
LEXINGTON
WINCHESTER
MEDFORD
NORTH WOBURN
WOBURN
Shawsheen River
Maple Meadow Brook
Mill Pond
Aberjona River
Sandy Brook
Long Meadow Brook
Vine Brook
Butterfield Pond
Cummings Brook
Horn Pond
Winter Pond
Wedge Pond
Spot Pond
Upper Mystic Lake

Appendix B

Stormwater Management Program Team

Stormwater Management Program Team

SWMP Team Coordinator

Name	Jay Duran	Title	DPW Superintendent
Department	Public Works		
Phone Number	781-897-5980	Email	jduran@cityofwoburn.com
Responsibilities	Administer Stormwater Management Program and oversee DPW tasks including Public Education, Public Participation and Good Housekeeping; coordinate among departments and with the Mystic River Watershed Association to meet permit requirements.		

SWMP Team

Name	John E. Corey Jr., P.E.	Title	City Engineer
Department	Engineering		
Phone Number	781-897-5880	Email	jaycorey@cityofwoburn.com
Responsibilities	Oversee stormwater tasks within Engineering, specifically, oversee and implement the IDDE Program, coordinate with Planning department on Post-Construction Stormwater Management Regulations and Assessments and with the DPW on Good Housekeeping Measures.		

Name	Matthew Barrett, GISP	Title	GIS Coordinator
Department	Engineering		
Phone Number	781-897-5883	Email	mbarrett@cityofwoburn.com
Responsibilities	Coordinate stormwater related GIS tasks; update stormwater system mapping as needed and keep track of inspections and outfall sampling.		

Name	John Fralick	Title	Health Agent
Department	Board of Health		
Phone Number	781-897-5920	Email	jfralick@cityofwoburn.com
Responsibilities	Provide opportunities for public involvement and participation through the Board of Health; Support the stormwater program and represent the Board of Health in stormwater related issues.		

Name	Theresa Murphy	Title	Conservation Administrator
Department	Conservation Commission		
Phone Number	781-897-5933	Email	tmurphy@cityofwoburn.com
Responsibilities	Provide opportunities for public involvement and participation through the Conservation Commission; Support the stormwater program and represent the Conservation Commission in stormwater related issues.		

Name	Lenny Burnham	Title	DPW Deputy Superintendent
Department	Public Works		
Phone Number	781-897-5980	Email	lburnham@cityofwoburn.com
Responsibilities	Support DPW Superintendent in administering Stormwater Management Program and in executing DPW stormwater tasks.		

Name	Meghan Doherty	Title	Health Code Enforcement Officer
Department	Board of Health		
Phone Number	781-897-5922	Email	mdoherty@cityofwoburn.com
Responsibilities	Support the stormwater program and enforce stormwater regulations related to the Health Code.		

Name	Tina Cassidy	Title	Planning Director
Department	Planning Board		
Phone Number	781-897-5817	Email	tcassidy@cityofwoburn.com
Responsibilities	Coordinate with other departments to provide outreach and education to residents; work with the Engineering Department to develop and implement construction and post-construction policies and to assess street and parking lot guidelines and allowing green infrastructure.		

Name	Scott Galvin	Title	Mayor
Department	Mayor's Office		
Phone Number	781-897-5901	Email	sgalvin@cityofwoburn.com
Responsibilities	Signs Annual Reports, SWPPPs and any other documents prepared under the permit.		

Name		Title	
Department			
Phone Number		Email	
Responsibilities			

Name		Title	
Department			
Phone Number		Email	
Responsibilities			

Name		Title	
Department			
Phone Number		Email	
Responsibilities			

Appendix C

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):

1-1: Hold Earth Day Celebration – now under BMP 2B

1-2: Hold Conservation Day Event – now under BMP 2B

1-3: Continue Pet Waste Disposal Practices – now under BMP 2B

1-4: Maintain Copies of Environmental Awareness Brochures – now under BMP 1A

1-5: Develop and Distribute Stormwater Brochure – now under BMPs 1A-D

1-6: DPW Staff Available for Classroom Discussions/Tours – now under BMP 2B

1-7: Stormwater Bulletins Added to Kiosks at Horn Pond – now under BMP 1A

1-8: Stormwater Information Added to DPW's Website – now under BMPs 1A-D

2-1: Comply with State Public Notification Guidelines – now under BMP 2A

2-2: Used Oil Collection Program – now under BMP 2B

2-3: Household Hazardous Waste/Tire Collection Days – now under BMP 2B

2-4: City-wide Recycling Program – now under BMP 2B

2-5: Street Tree Planting Program – now under BMP 2B

3-1: Continue to Inspect New Sewer Connections – now under BMP 3

3-2: Map of Outfalls and Receiving Waters – now under BMP 3C

3-3: Complete Dry Weather Screening of Outfalls – now under BMP 3E-2

3-4: Stormwater Ordinance – now under BMP 3A

3-5: Develop and Implement System for Detection and Elimination of Illicit Discharges – now under BMP 3D

4-1: Continue to Apply Standard 8 of the Massachusetts Stormwater Policy – now under BMP 4B

4-2: Procedures for Collection of Public Comments – BMP 2A

4-3: Continue Inspections for Erosion Control Measures at Construction Sites with Conservation Commission Review – now under BMP 4B

4-4: Procedure for Control of Discarded Building Materials – now under BMP 4B

4-5: Amend the Subdivision Regulations to Require an Erosion and Sediment Control Plan for Sites Disturbing more than 1-acre – now under BMP 4A

4-6: Amend the Zoning Ordinance to Require Erosion and Sediment Control Plan for Sites Disturbing More than 1-acre – now under BMP 4A

5-1: Continue to Implement City's Planning Board Rules and Subdivision Regulations – now under BMP 5A

5-2: Maintain Policy Ensuring Long-term Maintenance of Private Structural BMPs – now under BMP 5A

5-3: Adopt Massachusetts Stormwater Policy Standards #2, 3, 4, 7 and 9 in City Ordinances – now under BMP 5A

6-1: Continue Street Sweeping Program – now under BMP 6D-2

6-2: Continue Catch Basin Cleaning Program – now under BMP 6D-1

6-3: Continue Salting/Snow Removal Practices – now under BMP 6D-3

6-4: Hazardous Waste Response Program – now under BMPs 6A and 6C

6-5: Continue Vehicle Washing Practices – now under BMP 6A

6-6: Continue Vehicle Maintenance Practices – now under BMP 6A

6-7: Park and Landscape Maintenance – now under BMP 6A

6-8: Develop/Implement Employee Education/Training Program – now under BMP 3F

Appendix D

Endangered Species Act Eligibility Criteria Documentation

Endangered Species Act Eligibility Certification

TO: City of Woburn Stormwater Management Program Files

FROM: Tighe & Bond

COPY: John Duran, P.E., Superintendent of Public Works

John Corey, Jr., P.E., City Engineer

DATE: November 27, 2018

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, 2018, and determined that the **City of Woburn** 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) website[1] 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 Woburn.

Tighe & Bond then went to the USFWS New England Field Office website for Endangered Species Reviews/Consultations[2] and selected the Massachusetts state list[3] 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 Bat[4]. 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 Woburn. 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. Attachment E provides the results of Tighe & Bond's informal consultation on behalf of the

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[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

City of Woburn 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 City of Woburn'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 City of Woburn'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 City of Woburn'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 City of Woburn 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 3 resulted in "Yes" and thereby we determined the City of Woburn's action area meets the endangered species' eligibility requirements included in Criterion C.

J:\W\W2064 - Woburn Stormwater Assistance\NOI and SWMP\NOI\Drafts\Endangered Species Act Eligibility Certification.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 Appendix[1].

Applicants also have an independent ESA obligation to ensure that their activities do not result in any prohibited "take" of listed species[1][2]. The term "Take" is used in the ESA to include harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. "Harass" is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Many of the measures required in this general permit and in these instructions to protect species may also assist in ensuring that the applicant's activities do not result in a prohibited take of species in violation of section 9 of the ESA. If the applicant has plans or activities in an area where endangered and threatened species are located, they may wish to ensure that they are protected from potential take liability under ESA section 9 by obtaining an ESA section 10 permit or by requesting formal consultation under ESA section 7. Applicants that are unsure whether to pursue a section 10 permit or a section 7 consultation for takings protection should confer with the appropriate United States Fish and Wildlife Service (USFWS) office or the National Marine Fisheries Service (NMFS), (jointly the Services).

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

[1] EPA strongly encourages applicants to begin this process at the earliest possible stage to ensure the notification requirements for general permit coverage are complete upon Notice of Intent (NOI) submission.
[2] Section 9 of the ESA prohibits any person from "taking" a listed species (e.g. harassing or harming it) unless: (1) the taking is authorized through an "incidental take statement" as part of completion of formal consultation according to ESA section 7; (2) where an incidental take permit is obtained under ESA section 10 (which requires the development of a habitat conversion plan; or (3) where otherwise authorized or exempted under the ESA. This prohibition applies to all entities including private individuals, businesses, and governments.

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

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

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

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

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

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

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

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

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

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

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

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

Step 1 – Determine if you can meet USFWS Criterion A

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

USFWS Effects Determination Guidance:

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

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

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

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

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

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

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

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

Step 4 - Document Results of the Eligibility Determination

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

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

C. Submittal of Notice of Intent

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

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

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

E. Services Information

United States Fish and Wildlife Service Office

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

U.S. FWS – Region 5
Supervisor

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

Natural Heritage Network

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

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

U.S. Fish and Wildlife IPaC system instructions

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

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

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

a. Indicate the action area[1] for the MS4 by either:
    a. Drawing the boundary on the map or by uploading a shapefile.
    Select "Continue"

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

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

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

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

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

Attachment B

Town of Woburn 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: July 12, 2018
Consultation Code: 05E1NE00-2018-SLI-2367
Event Code: 05E1NE00-2018-E-05514
Project Name: Woburn 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: 05E1NE00-2018-SLI-2367

Event Code: 05E1NE00-2018-E-05514

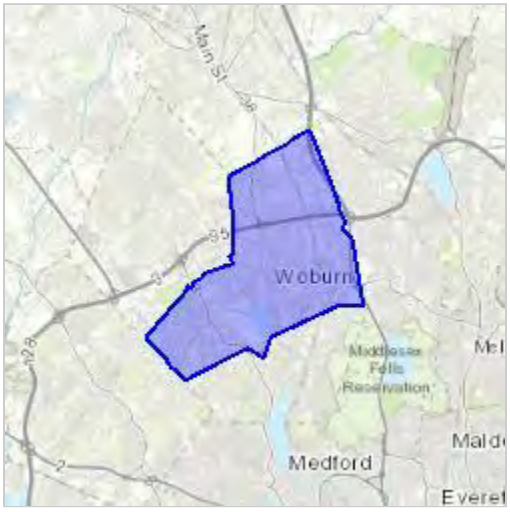
Project Name: Woburn Stormwater

Project Type: ** OTHER **

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

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.489847860235244N71.14316148822493W



Counties: Middlesex, MA

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

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

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

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

Updated 02/05/2016

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

[1]Migratory only, scattered along the coast in small numbers

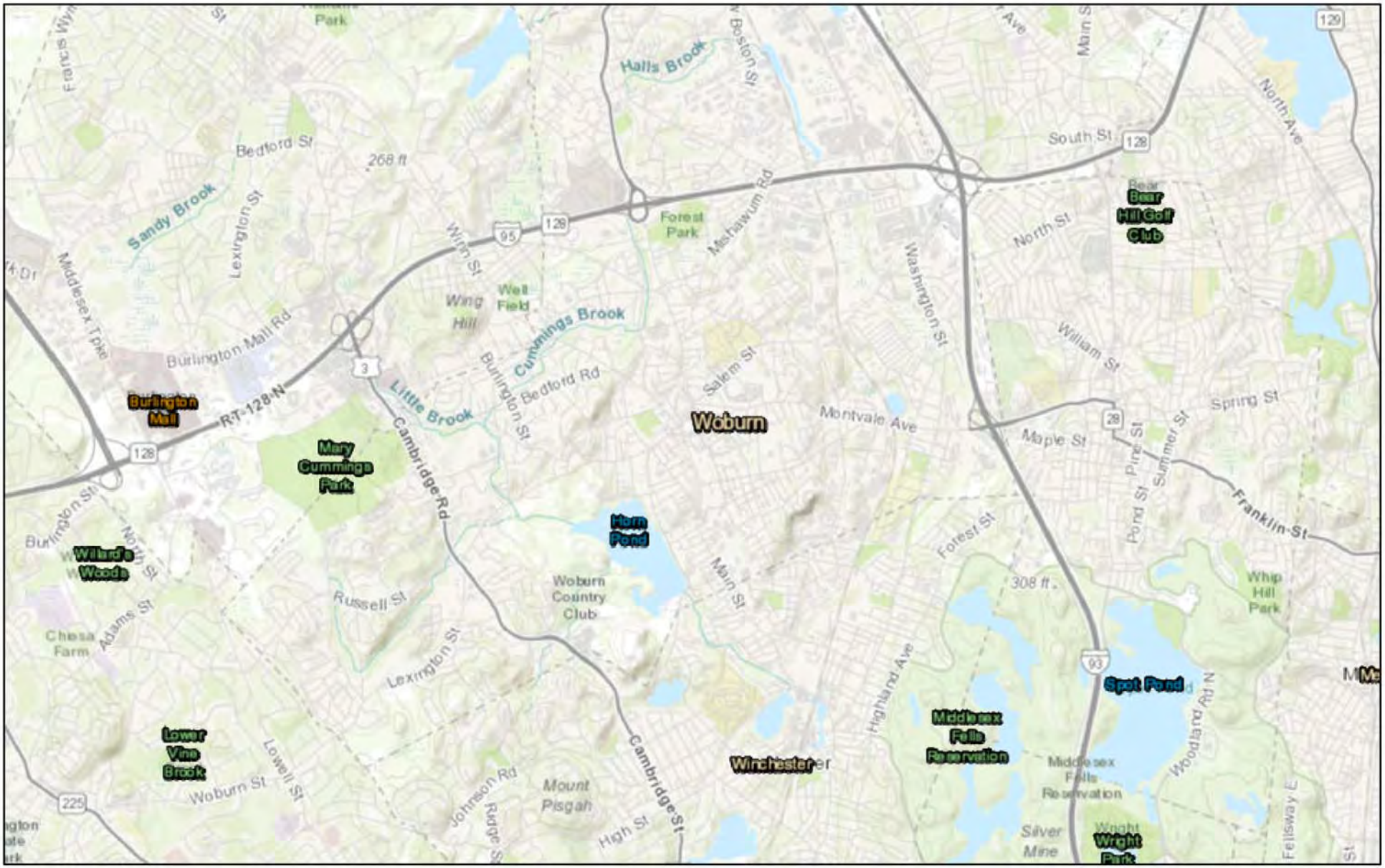
-Eastern cougar and gray wolf are considered extirpated in Massachusetts.
-Endangered gray wolves are not known to be present in Massachusetts, but dispersing individuals from source populations in Canada may occur statewide.
-Critical habitat for the Northern Red-bellied Cooter is present in Plymouth County.

Updated 02/05/2016

Attachment D

Massachusetts Natural Heritage and Endangered Species Program (NHESP) Northern Long-eared Bat Hibernaculum Location Map and Fact Sheet

Northern Longeared bat Hibernacula & Maternity Roosts



July 12, 2018

MA_NHESP_NLEB_Maternity_Roost_Tree_Locations

MA_Northern_Long_eared_Bat_Winter_Hibernacula

1:72,224

0 0.45 0.9 1.8 mi

0 0.75 1.5 3 km

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

Natural Heritage & Endangered Species Program

www.mass.gov/nhesp

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 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).

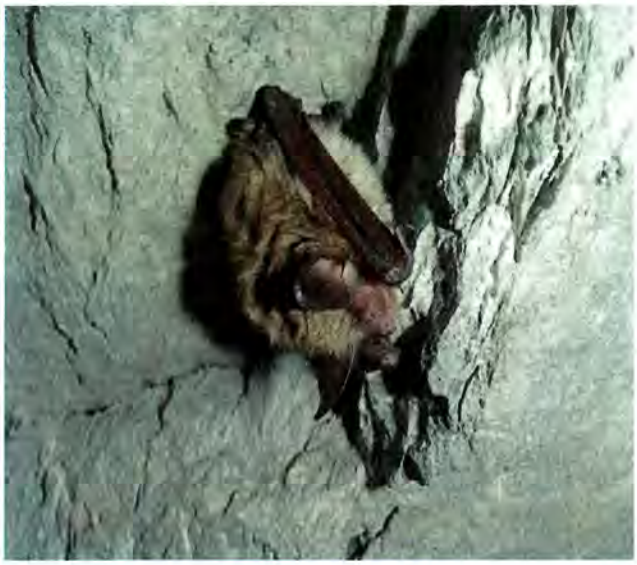


Photo: Tammy Ciesla, MassWildlife

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

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

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Massachusetts Division of Fisheries & Wildlife

1 Rabbit Hill Rd., Westborough, MA; tel: 508-389-6300; fax: 508-389-7890; www.mass.gov/dfw

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 accidently 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.

REFERENCES:

Caceres, M.C., and R.M. Barclay. 2000. Myotis septentrionalis. *Mammalian Species* 634: 1-4.

French, T.W., J.E. Cardoza, and G.S. Jones. *Homeowner's Guide to Bats*. Massachusetts Department of Fisheries & Wildlife: Westborough, MA.

Hamilton, Jr., W.J., and J.O. Whitaker, Jr. 1979. *Mammals of the Eastern United States*, Second Edition. Cornell University Press: Ithaca, NY.

U.S. Fish & Wildlife Service. 2012. "White-nose Syndrome." http://whitenosesyndrome.org/

Updated 2015

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Attachment E

U.S. Fish and Wildlife Service New England Field Office “No Species Present” 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 8, 2018

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 2018)

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 David Simmons of this office at 603-227-6425 if we can be of further assistance.

Sincerely yours,

Thomas R. Chapman
Supervisor
New England Field Office

Appendix E

Historic Properties Eligibility Criteria Documentation

National Historic Preservation Act Eligibility Certification

TO: City of Woburn Stormwater Management Program Files

FROM: Tighe & Bond

COPY: John Duran, P.E., Superintendent of Public Works

John Corey, Jr., P.E., City Engineer

DATE: November 27, 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 **City of Woburn** meets **Criterion A: 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 Woburn 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 City of Woburn'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 July 12, 2018. If the City undertakes construction on or around a property that is listed or eligible for listing, the City 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 City 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 City 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): Woburn; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
WOB.A	Battle Road - Old Lexington Road Area		Woburn	
WOB.B	Middlesex Canal		Woburn	
WOB.C	Metropolitan Park System of Greater Boston		Woburn	
WOB.D	Middlesex Canal Area		Woburn	
WOB.E	Diners of Massachusetts		Woburn	
WOB.F	Woburn Public Library		Woburn	
WOB.G	First Burial Ground		Woburn	
WOB.H	Baldwin Homestead Historic District		Woburn	
WOB.I	Saint Joseph's Roman Catholic Church Complex		Woburn	
WOB.J	Middlesex Canal Historic and Archaeological		Woburn	
WOB.K	Expanded Baldwin Homestead Historic District		Woburn	
WOB.L	Woburn Jewish Cemeteries		Woburn	
WOB.15	U. S. Post Office - Woburn Center Station	1 Abbott St	Woburn	1911
WOB.1	Baldwin, Loammi Mansion	2 Alfred St	Woburn	c 1750
WOB.46	Simonds, George A. House	1 Arlington Rd	Woburn	c 1900
WOB.47	Johnson, John House	4 Arlington Rd	Woburn	c 1860
WOB.291		6 Arlington Rd	Woburn	c 1830
WOB.293		8 Arlington Rd	Woburn	c 1910
WOB.48	Dow, Carrie Ellis - Lynch, Thomas K. House	9 Arlington Rd	Woburn	c 1890
WOB.294	Taylor, James Dexter House	10 Arlington Rd	Woburn	c 1860
WOB.49	Davis, William Frederic House	11 Arlington Rd	Woburn	1888
WOB.295		14 Arlington Rd	Woburn	c 1900
WOB.296		16 Arlington Rd	Woburn	c 1900
WOB.50	Ramsdell, Julius F. House	17 Arlington Rd	Woburn	c 1898
WOB.298	Trull, Alfred A. House	22 Arlington Rd	Woburn	c 1850
WOB.300		24 Arlington Rd	Woburn	c 1900
WOB.301		26 Arlington Rd	Woburn	c 1900

Inv. No.	Property Name	Street	Town	Year
WOB.302		30 Arlington Rd	Woburn	c 1890
WOB.303		34 Arlington Rd	Woburn	c 1890
WOB.305		36 Arlington Rd	Woburn	c 1900
WOB.635	Brown, Frederic J. House	37 Arlington Rd	Woburn	c 1882
WOB.307	Kean, Frederick Clarence House	40 Arlington Rd	Woburn	1906
WOB.636	Barnes, Rev. William S. - Ronco, David House	41 Arlington Rd	Woburn	c 1870
WOB.677	Hudson, Edward W. House	45 Arlington Rd	Woburn	c 1880
WOB.311		46 Arlington Rd	Woburn	c 1962
WOB.313	Parker, Frederick Chandler House	48 Arlington Rd	Woburn	c 1840
WOB.315		50 Arlington Rd	Woburn	c 1962
WOB.325		61 Arlington Rd	Woburn	c 1910
WOB.318	Butts, Charles A. House	62 Arlington Rd	Woburn	1928
WOB.326		63 Arlington Rd	Woburn	c 1900
WOB.319		64 Arlington Rd	Woburn	c 1910
WOB.327		65 Arlington Rd	Woburn	c 1930
WOB.322		66 Arlington Rd	Woburn	c 1890
WOB.329		69 Arlington Rd	Woburn	c 1900
WOB.637	Crovo, Harry House	70 Arlington Rd	Woburn	1924
WOB.338	Hudson, Edward W. Double House	92 Arlington Rd	Woburn	c 1860
WOB.638	McCauley, Patrick Filling Station	92 Arlington Rd	Woburn	r 1920
WOB.339		100 Arlington Rd	Woburn	c 1960
WOB.340		106 Arlington Rd	Woburn	c 1930
WOB.341		108 Arlington Rd	Woburn	c 1940
WOB.342		110 Arlington Rd	Woburn	c 1940
WOB.343	McLaughlin, James A. House	112 Arlington Rd	Woburn	c 1918
WOB.344		114 Arlington Rd	Woburn	c 1900
WOB.345		116 Arlington Rd	Woburn	c 1960
WOB.346		120 Arlington Rd	Woburn	c 1957
WOB.347		126 Arlington Rd	Woburn	c 1957
WOB.348		130 Arlington Rd	Woburn	c 1959
WOB.350	Leathe, Josiah - Burke, Patrick House	138 Arlington Rd	Woburn	c 1850
WOB.640	Donahue, Patrick Double House	6 Ash St	Woburn	c 1875
WOB.641	Sloan, Patrick - McGowan, Charles E. House	10 Ash St	Woburn	c 1870
WOB.642	Meehan, Bernard House	12 Ash St	Woburn	c 1870
WOB.248		2 Ashburton Ave	Woburn	c 1940
WOB.515	Stewart, Joseph E. House	27 Auburn St	Woburn	c 1880
WOB.516	McDermott, Michael House	18 Bacon St	Woburn	c 1887
WOB.356	Rand, Charles H. House	6 Beach St	Woburn	c 1870

Inv. No.	Property Name	Street	Town	Year
WOB.357	Knight, Alden House	10 Beach St	Woburn	c 1860
WOB.358	Kenney, John P. House	11 Beach St	Woburn	c 1926
WOB.359	Wright, Jacob House	15 Beach St	Woburn	c 1875
WOB.360	French, Charles P. - McHugh, Annie House	18-20 Beach St	Woburn	c 1910
WOB.361	Cummings, William H. - Wood, Charles Lincoln House	19 Beach St	Woburn	c 1882
WOB.518	Winn, J. House	5 Beacon St	Woburn	r 1830
WOB.519	Winn, J. House	7 Beacon St	Woburn	c 1840
WOB.520	Gifford, Seth - Hurd, E. Arthur House	9 Beacon St	Woburn	c 1887
WOB.521	Winn, Joseph - Gifford, Seth House	11 Beacon St	Woburn	c 1830
WOB.522	Simonds, Susan House	13 Beacon St	Woburn	c 1860
WOB.517	O'Hara, Martin House	22 Beacon St	Woburn	c 1894
WOB.51	Cutler, Warren House	40 Beacon St	Woburn	c 1860
WOB.52	Nichols, Frank C. Double House	43 Beacon St	Woburn	c 1890
WOB.362	Bowen, John - Shea, Michael House	49 Bedford Rd	Woburn	c 1870
WOB.523	Breslin, Charles House	80 Bedford Rd	Woburn	c 1850
WOB.524	Given, Frederic House	116 Bedford Rd	Woburn	c 1880
WOB.525	Johnson, Oscar House	118 Bedford Rd	Woburn	c 1916
WOB.526	Cummings, John House	120 Bedford Rd	Woburn	c 1810
WOB.527	Wenzell, Henry - Blaney, George Arnold House	131 Bedford Rd	Woburn	c 1865
WOB.528	Cummings, John - Stevenson, Matthew House	134 Bedford Rd	Woburn	c 1860
WOB.529	McLaughlin, Neil - Ellard, John House	135 Bedford Rd	Woburn	c 1860
WOB.530	Cummings, John - O'Rourke, Edward House	136 Bedford Rd	Woburn	c 1860
WOB.531		137 Bedford Rd	Woburn	c 1910
WOB.532	Cummings, Cyrus - Glass, Isabella G. House	141 Bedford Rd	Woburn	c 1870
WOB.533	Cummings, Cyrus Double House and Market	143 Bedford Rd	Woburn	c 1860
WOB.534	Cummings, John - Busteed, Adam Double House	157-159 Bedford Rd	Woburn	c 1810
WOB.535	Bacon, John - Doherty, John A. Double House	161-163 Bedford Rd	Woburn	r 1820
WOB.536	Kendall, Nathaniel - Cummings, John Double House	167-169 Bedford Rd	Woburn	c 1840
WOB.537	Downs, Mark - Heald, Alvah House	171 Bedford Rd	Woburn	c 1860
WOB.538	Heald, Alvah Barn	171 Bedford Rd	Woburn	r 1920
WOB.539	Graham, A. House	173 Bedford Rd	Woburn	c 1880
WOB.540	Barrett, Abel House	175 Bedford Rd	Woburn	c 1880
WOB.541	Harron, John Garage	175 Bedford Rd	Woburn	r 1920
WOB.2	Martin, Capt. William House	10 Bennett St	Woburn	c 1828
WOB.363	Leahey, Edward M. House	4 Blake St	Woburn	1928
WOB.364	Watt, John - Potamis, Gregory House	5 Blake St	Woburn	1928

Inv. No.	Property Name	Street	Town	Year
WOB.365	Maguire, John House	6 Blake St	Woburn	1928
WOB.366	Blake, Henry C. House	8 Blake St	Woburn	1928
WOB.367	Blake, Henry C. - McGonagle, Daniel House	10 Blake St	Woburn	1928
WOB.368	Blake, Henry C. - Carpenter, Edna House	1 Blake Terr	Woburn	c 1930
WOB.369	Howe, William House	3 Blake Terr	Woburn	1927
WOB.370	Smith, Kennick R. - Garrity, Mary House	5 Blake Terr	Woburn	1927
WOB.53	Conn, Horace - Place, Griffin Carriage House	6 Blake Terr	Woburn	c 1868
WOB.371	Blake, Henry C. - Mahoney, Edward House	7 Blake Terr	Woburn	1928
WOB.643	Dolan, Thomas House	10 Border St	Woburn	c 1870
WOB.4	Converse, Josiah - Richardson, Bartholomew House	76 Bow St	Woburn	c 1675
WOB.231	Richardson, F. P. Barn	76 Bow St	Woburn	r 1885
WOB.644	McDonald, James - Sullivan, Patrick House	12 Buckman Ct	Woburn	r 1875
WOB.55	Flagg, Benjamin F. House	51 Burlington St	Woburn	c 1880
WOB.56	Blanchard, David O. House	133 Burlington St	Woburn	c 1860
WOB.372	Nichols, Charles A. House	3 Burlington St.	Woburn	c 1870
WOB.34	Cummings, Ebenezer - Cummings, Charles House	35 Cambridge Rd	Woburn	c 1850
WOB.373	Weston, John House	134 Cambridge Rd	Woburn	c 1840
WOB.57	Tarky, William J. House	165 Cambridge Rd	Woburn	c 1920
WOB.58	Hale, Jonas House	210 Cambridge Rd	Woburn	c 1830
WOB.59	Looker, Bertha - Reeves, George House	213 Cambridge Rd	Woburn	c 1910
WOB.60	Russell, George House	216 Cambridge Rd	Woburn	c 1830
WOB.61	Cambridge Street School	216R Cambridge Rd	Woburn	c 1844
WOB.230	Russell, William Barn	216 Cambridge Rd	Woburn	r 1920
WOB.5	Parker, Joseph - Tufts, William A. House	221 Cambridge Rd	Woburn	1782
WOB.374	Parker, Joseph - Heald, Jonathan Bradford House	241 Cambridge Rd	Woburn	c 1800
WOB.26	Saint Joseph's Roman Catholic Rectory	22 Central St	Woburn	c 1840
WOB.27	Saint Joseph's Roman Catholic Rectory Garage	22 Central St	Woburn	c 1920
WOB.940	Saint Joseph's Roman Catholic Church Ballfield	22 Central St	Woburn	c 1920
WOB.542	Bucknam, Asahel Porter House	26 Central St	Woburn	c 1830
WOB.375	Johnson, Nathaniel M. House	3 Charles St	Woburn	c 1840
WOB.376	Shaw, J. W. Double House	5-7 Charles St	Woburn	c 1890
WOB.377	Carter, Alfred Gowing House	6-8 Charles St	Woburn	c 1870
WOB.378	Cole, Joseph H. House	9 Charles St	Woburn	c 1890
WOB.379	Rice, Thomas House	12 Charles St	Woburn	c 1870
WOB.380	Thurston, Samuel House	14 Charles St	Woburn	c 1860
WOB.574	Madan, John Jr. - Cooper, Charles E. Barn	2 Chestnut St	Woburn	c 1840

Inv. No.	Property Name	Street	Town	Year
WOB.62	Skinner, James Leather Company Worker Housing	6 Chestnut St	Woburn	c 1860
WOB.268		37 1/2 Chestnut St	Woburn	c 1880
WOB.269		45 Chestnut St	Woburn	c 1890
WOB.271		47 Chestnut St	Woburn	c 1910
WOB.543	Dow, Stephen Double House	4-6 Church Ave	Woburn	c 1820
WOB.63	Richardson, Lemuel Gerrish House	14 Church Ave	Woburn	c 1860
WOB.199	Richardson, Lemuel Gerrish Carriage House	14 Church Ave	Woburn	
WOB.544	Smith, Susan - Miller, John House	17 Church Ave	Woburn	c 1852
WOB.381	Kelley, Joseph House	10 Church St	Woburn	c 1850
WOB.545	Kelley, Joseph - Poole, Eleazer Flagg Double House	20-22 Church St	Woburn	c 1840
WOB.382	Whitcher, Celenda Thompson House	3 Cleveland Ave	Woburn	1888
WOB.383	Kendrick, Simeon Edgar House	6 Cleveland Ave	Woburn	c 1880
WOB.384	Eames, Henry M. House	7 Cleveland Ave	Woburn	c 1890
WOB.385	Godkin, Bertha House	8 Cleveland Ave	Woburn	c 1890
WOB.386	Conn, George C. House	9 Cleveland Ave	Woburn	c 1890
WOB.387	Long, Margaret I. House	10 Cleveland Ave	Woburn	c 1890
WOB.388	Parker, Gordon House	11 Cleveland Ave	Woburn	c 1890
WOB.389	Cummings, William H. - Burke, Michael F. House	12 Cleveland Ave	Woburn	c 1890
WOB.390		13 Cleveland Ave	Woburn	c 1923
WOB.391		13A Cleveland Ave	Woburn	c 1923
WOB.392	Cummings, William H. House	14 Cleveland Ave	Woburn	c 1890
WOB.393	Sweetser, John H. House	15 Cleveland Ave	Woburn	c 1890
WOB.394	Cummings, Frank H. House	16 Cleveland Ave	Woburn	c 1890
WOB.395	Cummings, William F. - Connolly, Thomas W.	17 Cleveland Ave	Woburn	c 1890
WOB.396	Wheaton, Joseph Ray	18 Cleveland Ave	Woburn	c 1910
WOB.397	Emery, William F. - Leland, Frank House	19 Cleveland Ave	Woburn	c 1880
WOB.398	LeBaron, William H.B. House	21 Cleveland Ave	Woburn	c 1880
WOB.399	Cummings, William H. House	22 Cleveland Ave	Woburn	c 1890
WOB.400	Randall, Hiram G - Wood, Guy House	25 Cleveland Ave	Woburn	c 1880
WOB.401	Kelleher, Timothy House	35 Cleveland Ave	Woburn	c 1915
WOB.402	Clement, Albert A. House	7 Clinton St	Woburn	c 1875
WOB.403	Claridge, Fred H. - Boutwell, James E. House	9 Clinton St	Woburn	c 1870
WOB.404	Temple, Charles Augustus House	10 Clinton St	Woburn	c 1910
WOB.405	Hart - Clinton Hose Company #6	12 Clinton St	Woburn	r 1879
WOB.406	Young, Charles House	14 Clinton St	Woburn	c 1920
WOB.407	Knapp, Josephine House	16 Clinton St	Woburn	c 1875

Inv. No.	Property Name	Street	Town	Year
WOB.408	Firth, John - Teele, Melinda House	17 Clinton St	Woburn	c 1860
WOB.409	Cavicchi, Joseph House	18 Clinton St	Woburn	1925
WOB.411	Brooks, R. W. Double House	19-21 Clinton St	Woburn	c 1880
WOB.410	Murdock, Alexander House	20 Clinton St	Woburn	1893
WOB.412	Sheeran, Frank J. House	22 Clinton St	Woburn	1906
WOB.413	McKay, Joseph House	23 Clinton St	Woburn	1929
WOB.414	Richardson, Marshall L. House	25 Clinton St	Woburn	c 1860
WOB.415	Richardson, Sydney S. Double House	26-28 Clinton St	Woburn	c 1870
WOB.416	Ames, Jacob House	29 Clinton St	Woburn	r 1855
WOB.417	Singer, William J. House	36 Clinton St	Woburn	c 1890
WOB.901	Woburn World War I Memorial	Common St	Woburn	c 1920
WOB.902	U. S. S. Maine Ventilator Cowl	Common St	Woburn	1912
WOB.904	Woburn Spanish American War Statue	Common St	Woburn	1934
WOB.913	Woburn Vietnam War Memorial	Common St	Woburn	c 1980
WOB.914	Woburn Korean War Memorial	Common St	Woburn	1978
WOB.915	Woburn World War II Memorial	Common St	Woburn	1944
WOB.64	Woburn Co-operative Bank	6 Common St	Woburn	1927
WOB.16	Woburn City Hall	10 Common St	Woburn	1930
WOB.65	Grammer, William T. and Samuel House	15 Court St	Woburn	c 1860
WOB.66	Woburn Water Works Engine House	5 Cove St	Woburn	1873
WOB.546	Tripp, Charles Edgar House	2 Eastern Ave	Woburn	c 1890
WOB.547	Fowle, Jeduthun - Pierce, William House	4 Eastern Ave	Woburn	c 1850
WOB.548	Grothe, John Barn	4 Eastern Ave	Woburn	c 1906
WOB.549	Putnam, William R. Double House	33-35 Eastern Ave	Woburn	c 1870
WOB.418	Seaver, John - McGrath, Jame F. House	14 Eaton Ave	Woburn	1897
WOB.419	Lausch, Frederick A. - McHugh, Rev. Thomas F House	16 Eaton Ave	Woburn	1897
WOB.420	Larsen, Hans P. House	18 Eaton Ave	Woburn	1897
WOB.421	Koniares, Theodore House	20 Eaton Ave	Woburn	1928
WOB.422	Kimball, Charles H. - Murray, Francis H. House	21 Eaton Ave	Woburn	1898
WOB.423	Ray, Arthur F. House	24 Eaton Ave	Woburn	1917
WOB.424	McLatchy, Allen H. House	28 Eaton Ave	Woburn	1923
WOB.425	Smith, William P. - Bagnall, Herbert V. House	29 Eaton Ave	Woburn	c 1895
WOB.426	Ray, John Oliver House	33 Eaton Ave	Woburn	1895
WOB.427	Dearborn, Charles A. House	35 Eaton Ave	Woburn	1893
WOB.428	Haber, William - Henchey, Judge William House	41 Eaton Ave	Woburn	1898
WOB.429	Houghton, Thomas Frank House	43 Eaton Ave	Woburn	1892
WOB.430	Bailey, David E. House	45 Eaton Ave	Woburn	1925

Inv. No.	Property Name	Street	Town	Year
WOB.431	Cummings, Eustace House	47 Eaton Ave	Woburn	1921
WOB.432	Cummings, Edward H. House	49 Eaton Ave	Woburn	c 1920
WOB.433	Riley, Thomas F. House	51 Eaton Ave	Woburn	1916
WOB.10	Baldwin Farmhouse	16-18 Elm St	Woburn	c 1820
WOB.67	Kimball, Charles H. House	19 Elm St	Woburn	c 1890
WOB.39	Thompson, Cyrus House	21 Elm St	Woburn	c 1820
WOB.68	Bowser, Fred H. Jr. House	22 Elm St	Woburn	c 1920
WOB.200	Bowser, Fred H. Jr. Garage	22 Elm St	Woburn	c 1920
WOB.40	Thompson, Samuel House	31 Elm St	Woburn	c 1730
WOB.41	Thompson, Eunice Memorial Library	33 Elm St	Woburn	1906
WOB.69	Dearborn, Charles T. House	41 Elm St	Woburn	1882
WOB.70	Buckman, Minot House	43 Elm St	Woburn	c 1885
WOB.201	Mack, Richard - Horne, Chester Garage	43 Elm St	Woburn	c 1920
WOB.42	Thompson, Charles House	44 Elm St	Woburn	c 1800
WOB.71	Goodwin, Mary F. Double House	45 Elm St	Woburn	c 1884
WOB.72	North Congregational Church Parsonage	53 Elm St	Woburn	1894
WOB.202	North Congregational Church Parsonage Garage	53 Elm St	Woburn	r 1920
WOB.73	Bixby, Dr. Josiah Peet House	55 Elm St	Woburn	1893
WOB.203	Bixby, Dr. Josiah Peet Barn	55 Elm St	Woburn	
WOB.43	Thompson, Charles Roswell House	58 Elm St	Woburn	r 1780
WOB.36	Pierce, Charles A. House	59 Elm St	Woburn	c 1900
WOB.74	Carter, Frank House	64 Elm St	Woburn	c 1910
WOB.204		64 Elm St	Woburn	r 1980
WOB.75	Richardson, E. House	65 Elm St	Woburn	c 1880
WOB.205	Shannon, Thomas J. Garage	65 Elm St	Woburn	
WOB.168	Shannon, Thomas J. - Duncan, Andrew House	67R Elm St	Woburn	c 1890
WOB.76	Winn, Abigail House	69 Elm St	Woburn	r 1880
WOB.77	Perkins, Warren B. House	70 Elm St	Woburn	c 1850
WOB.3	Shaw, Lewis - Brooks, H. House	71 Elm St	Woburn	c 1800
WOB.9	Tidd, John House	74 Elm St	Woburn	1809
WOB.78	Winn House	75 Elm St	Woburn	c 1880
WOB.79	Winn House	77 Elm St	Woburn	c 1880
WOB.207	Winn Barn	77 Elm St	Woburn	c 1880
WOB.80	Alley, Charles House	79 Elm St	Woburn	1880
WOB.81	Hopkinson, Sumner House	80 Elm St	Woburn	c 1906
WOB.208	Hopkinson, Sumner Garage	80 Elm St	Woburn	c 1906
WOB.82	Flint, Frederick W. House	81 Elm St	Woburn	c 1890
WOB.11	Rumford, Count Birthplace	90 Elm St	Woburn	1714

Inv. No.	Property Name	Street	Town	Year
WOB.550	Hayward, Alpheus Shaw House	4 Fairmount St	Woburn	c 1860
WOB.551	Seminatore, Salvatore House	8 Flagg St	Woburn	c 1925
WOB.645	Whitney, Lewis Lafayette House	51 Fowle St	Woburn	c 1850
WOB.646	Whitney, Lewis Lafayette Barn	51 Fowle St	Woburn	c 1850
WOB.647	Pollard, S. O. - Cummings, Eustace Carriage House	98 Fowle St	Woburn	c 1870
WOB.83	Wyman, Arthur - Case, Walter House	1 Frances St	Woburn	c 1890
WOB.84	Tidd, Alice Stanwood - Leathe, Henry House	3 Frances St	Woburn	c 1900
WOB.85	Murdock, J. Grafton House	5 Frances St	Woburn	c 1900
WOB.86	Langill, Amos House	9 Frances St	Woburn	c 1896
WOB.87	Murdock, John K. House	10 Frances St	Woburn	1913
WOB.88	Parker, John - Hovey, H. Stillman House	12-16 Frances St	Woburn	c 1875
WOB.89	Thompson, L. Waldo House	17 Frances St	Woburn	1911
WOB.552	Flagg, George - Conn, Horace House	12 Franklin St	Woburn	c 1840
WOB.553	Bancroft, Parker Everton Double House	14-16 Franklin St	Woburn	c 1885
WOB.554	Smith, Cyrus - Wyer, Benjamin Franklin Double Hse	17-19 Franklin St	Woburn	c 1840
WOB.555	Reed, Artemas - Cummings, Joshua House	21 Franklin St	Woburn	1853
WOB.90	Gage, G. R. - Caros, Paul House	22 Franklin St	Woburn	c 1880
WOB.91	Evans, Thomas J. House	25 Franklin St	Woburn	c 1865
WOB.556	Thompson, George - Jameson, John House	27 Franklin St	Woburn	c 1840
WOB.557	Simonds, Edward - Walsh, Dennis House	30 Franklin St	Woburn	c 1849
WOB.558	Whitford, Hiram - Taylor, Susan House	32 Franklin St	Woburn	c 1845
WOB.559	Vinall, Whitney House	33 Franklin St	Woburn	c 1840
WOB.560	Harrington, Charles House	35 Franklin St	Woburn	c 1840
WOB.561	McCauley, John F. - Mahoney, John House	3 Frederick Dr	Woburn	c 1940
WOB.562	Cedario, John - Lovell, Carleton House	10 Frederick Dr	Woburn	c 1940
WOB.648	Fowle, George E. House	67 Garfield Ave	Woburn	c 1865
WOB.649	Kimball, George W. House	76 Garfield Ave	Woburn	c 1872
WOB.650	Kimball, George W. Carriage House	76 Garfield Ave	Woburn	c 1880
WOB.651	Littlefield, Joshua - Miller, William M. House	1 Glenwood St	Woburn	c 1850
WOB.652	Littlefield, Clarence House	9 Glenwood St	Woburn	c 1860
WOB.653	Littlefield, Clarence Carriage House	9 Glenwood St	Woburn	c 1860
WOB.654	Boston Edison Electric Substation	Green St	Woburn	c 1918
WOB.655	Littlefield, Joshua House	18 Green St	Woburn	c 1840
WOB.656	Pollard, Mary S. House	20 Green St	Woburn	c 1925
WOB.657	Ring, Margaret House	22 Green St	Woburn	r 1930
WOB.658	Cottle, Edmund C. - Marion, C. Walter House	25 Green St	Woburn	c 1886

Inv. No.	Property Name	Street	Town	Year
WOB.659	Frisbee, Dr. Jesse Franklin House	26 Green St	Woburn	c 1865
WOB.660	Harkins, Thomas F. Store	26A Green St	Woburn	c 1920
WOB.661	Cummings, Cyrus Jr. House	38 Green St	Woburn	c 1875
WOB.662	Lord, George - White, James N. House	88 Green St	Woburn	c 1885
WOB.663	Larson, Nelse - Casey, William E. House	116 Green St	Woburn	r 1920
WOB.54	Flagg House	129 Harrison Ave	Woburn	c 1820
WOB.678	Richardson, Joseph House	6 Hart Pl	Woburn	c 1850
WOB.679	McLeod, George House	19 Hart Pl	Woburn	1889
WOB.563	Burbank, Daniel House	25 Hawthorne St	Woburn	c 1830
WOB.664	Johnson, Edward F. House	1 Highland St	Woburn	1882
WOB.665	Lewis, Hanson Beetfield House	2A Highland St	Woburn	1851
WOB.666	McDonald, Joseph B. House	4 Highland St	Woburn	c 1870
WOB.92	Cottle, Edmund C. House	14 Highland St	Woburn	c 1875
WOB.209	Cottle, Edmund C. Carriage House	14 Highland St	Woburn	c 1875
WOB.93	Hudson, Edward W. Groundskeeper's Cottage	35 Hudson St	Woburn	c 1870
WOB.905	Revolutionary War Memorial	Johnson St	Woburn	1924
WOB.564	Gleason, Henry A. - Dickinson, Joseph Albert House	1 Johnson St	Woburn	c 1840
WOB.680	Porter, Benjamin T. H. House	2 Johnson St	Woburn	c 1865
WOB.565	Kimball, William Kilroy House	6 Johnson St	Woburn	c 1850
WOB.566	Buckman, Otis - Shattuck, Nathan J. House	7 Johnson St	Woburn	c 1840
WOB.681	Cummings, R. - Balfe, Luke House	14 Kilby St	Woburn	c 1830
WOB.682	Mulligan, Bernard House	17 Kilby St	Woburn	c 1860
WOB.683	Fox, Warren House	21 Kilby St	Woburn	c 1830
WOB.684	Wheeler, John S. House	23 Kilby St	Woburn	c 1860
WOB.686	Parker, Benjamin - Coccoluto, Cosmo House	26 Kilby St	Woburn	c 1840
WOB.685	Fox, Warren - Clements, William House	27-29 Kilby St	Woburn	c 1850
WOB.687	Buckman, Ira House	33 Kilby St	Woburn	c 1840
WOB.264		37 Kilby St	Woburn	c 1950
WOB.265		37 Kilby St	Woburn	c 1980
WOB.266		37 Kilby St	Woburn	c 1980
WOB.688	Stevens, Edwin W. House	48 Kilby St	Woburn	c 1870
WOB.689	Johnson, Oscar E. House	50 Kilby St	Woburn	c 1887
WOB.690	Fox, John William House	54 Kilby St	Woburn	1886
WOB.691	Fox, John William Carriage House	54 Kilby St	Woburn	c 1886
WOB.692	Bryenton, Amos House	60 Kilby St	Woburn	c 1891
WOB.434	Eaton, Marcus - Stuart, Dr. James N. House	61 Kilby St	Woburn	c 1866
WOB.435	Kendall, Nathaniel House	69 Kilby St	Woburn	c 1860

Inv. No.	Property Name	Street	Town	Year
WOB.693	Kenney, Kieran House	73 Kilby St	Woburn	c 1860
WOB.694	Grant, John T. - Donovan, Patrick House	74 Kilby St	Woburn	c 1893
WOB.695	Davis, Albert D. House	78 Kilby St	Woburn	c 1890
WOB.436	Knowlton, Amos House	83 Kilby St	Woburn	c 1860
WOB.696	Cook, George House	87 Kilby St	Woburn	c 1871
WOB.667	Maguire, John H. House	22 Lake Ave	Woburn	c 1880
WOB.437	McGowan, Patrick House	24 Lake Ave	Woburn	c 1880
WOB.351		34 Lake Ave	Woburn	c 1950
WOB.355		1 Lake Circ	Woburn	c 1975
WOB.352		1 Lake Terr	Woburn	c 1955
WOB.353		7 Lake Terr	Woburn	c 1958
WOB.24	Horn Pond House	7 Lakeview Terr	Woburn	c 1820
WOB.94	O'Neill, George C. - Dolan, Elizabeth House	28 Lawrence St	Woburn	c 1925
WOB.567	Ober, Benjamin H. - Manard, William House	6 Lexington St	Woburn	c 1840
WOB.568	McIntire, Joseph - Colomb, Esther House	10 Lexington St	Woburn	c 1845
WOB.569	Colomb, Esther Barn	10 Lexington St	Woburn	r 1900
WOB.570	Thompson, Benjamin F. - Vaughan, William House	12 Lexington St	Woburn	c 1820
WOB.95	Flagg, Benjamin F. - Jones, Jenkins W. House	53 Lexington St	Woburn	c 1840
WOB.210	Jones, Jenkins W. Barn	53 Lexington St	Woburn	c 1840
WOB.7	Gardner, Dea. Joseph House	168 Lexington St	Woburn	1820
WOB.96	Harris, William B. - Pierce, Theodore L. House	183 Lexington St	Woburn	c 1810
WOB.97	Collins, Agnes House	190 Lexington St	Woburn	c 1930
WOB.98	Shannon, Robert J. House	287 Lexington St	Woburn	c 1920
WOB.99	Shannon, James House	299 Lexington St	Woburn	r 1900
WOB.100	Shannon, James W. House	305 Lexington St	Woburn	c 1920
WOB.278		Library Pl	Woburn	c 1980
WOB.438	Scire, Fortunato House	11 Locust St	Woburn	1926
WOB.439	Church, Stillman H. House	2 Lowell St	Woburn	c 1880
WOB.440	Church, Stillman H. House	4-6 Lowell St	Woburn	c 1890
WOB.441	Greydon, Frank W. House	7 Lowell St	Woburn	1896
WOB.442	Minot, Robert S. House	10 Lowell St	Woburn	c 1890
WOB.13	Thompson, Leonard House	11 Lowell St	Woburn	c 1810
WOB.443	Richards, Edward H. House	12 Lowell St	Woburn	c 1890
WOB.444	Minot, Robert S. House	14 Lowell St	Woburn	c 1895
WOB.445	Greydon, William F. - Kerr, Lewis Double House	16 Lowell St	Woburn	c 1920
WOB.446	Young, William Stage House	41 Lowell St	Woburn	c 1779
WOB.101	Fowle, Timothy House	2 Lynn St	Woburn	c 1850

Inv. No.	Property Name	Street	Town	Year
WOB.104	Saint Charles Roman Catholic Elementary School	Main St	Woburn	1907
WOB.903	Woburn Civil War Memorial	Main St	Woburn	1869
WOB.907	Baldwin, Col. Loammi Statue	Main St	Woburn	1917
WOB.102	Saint Charles Roman Catholic Church Rectory	280 Main St	Woburn	1898
WOB.941	Guardian Angel Statue	280 Main St	Woburn	1912
WOB.103	Saint Charles Borromeo Roman Catholic Church	282 Main St	Woburn	1869
WOB.17	Woburn Company G - Fifth Regiment Armory	320 Main St	Woburn	1916
WOB.20	First Congregational Church in Woburn	322 Main St	Woburn	1860
WOB.105	Bank Block - Woburn Masonic Hall	395 Main St	Woburn	1862
WOB.106	Wade, Col. John Block	406 Main St	Woburn	c 1810
WOB.19	Best Petroleum - Colonial Beacon Filling Station	477 Main St	Woburn	r 1925
WOB.571	Parker, Ebenezer - Parker, John House	520 Main St	Woburn	c 1853
WOB.107	Woods, Rev. Frederick House	524 Main St	Woburn	c 1890
WOB.572	Parker, Ebenezer - Hammond, Joseph House	528 Main St	Woburn	c 1840
WOB.108	Young, Mary A. Double House	537 Main St	Woburn	c 1840
WOB.573	Madan, John Jr. - Cooper, Charles E. House	564 Main St	Woburn	c 1840
WOB.109	Hayes, Henry B. House	568 Main St	Woburn	c 1885
WOB.447	Gillette, Osborn D. House	577 Main St	Woburn	c 1895
WOB.448	Lane, Susan M. House	578 Main St	Woburn	c 1895
WOB.449	Almore, The	579 Main St	Woburn	c 1920
WOB.450	Lane, Susan M. - Callahan, Daniel F. House	580 Main St	Woburn	c 1895
WOB.451		581 Main St	Woburn	c 1926
WOB.452	Lane, Susan M. House	582 Main St	Woburn	c 1904
WOB.453	Wyman, Elijah House	590 Main St	Woburn	r 1800
WOB.454	Wyman, Elijah Barn	592 Main St	Woburn	c 1910
WOB.455	Main Street School	595 Main St	Woburn	1794
WOB.110	Ames, Erskine House	596 Main St	Woburn	c 1830
WOB.111	Prior, William A. House	602 Main St	Woburn	r 1890
WOB.112	Murdock, John K. House	604 Main St	Woburn	c 1895
WOB.211	Murdock, John K. Carriage House	604 Main St	Woburn	c 1895
WOB.113	Wade - Wyman, Walter House	605 Main St	Woburn	c 1840
WOB.212	Burdett, C. Fred Garage	605 Main St	Woburn	c 1930
WOB.114	Hartshorne, George Franklin House	607 Main St	Woburn	c 1891
WOB.115	Beggs, Mary House	616 Main St	Woburn	c 1900
WOB.116	Beggs, William House	620 Main St	Woburn	c 1890
WOB.117	Burdett, Fred Hartshorne House	623 Main St	Woburn	c 1895
WOB.118	Conn, Horace - Place, Griffin House	627 Main St	Woburn	c 1868

Inv. No.	Property Name	Street	Town	Year
WOB.119	Place, Everett Griffin House	628 Main St	Woburn	c 1890
WOB.120	Trull, S. Franksford House	629 Main St	Woburn	c 1895
WOB.456		632 Main St	Woburn	c 1900
WOB.457	Pearson, John T. House	635 Main St	Woburn	c 1840
WOB.458	Wyman, W. House	636 Main St	Woburn	r 1830
WOB.459	Fox, Everett House	637 Main St	Woburn	c 1880
WOB.460	Slater, William H. House	639 Main St	Woburn	c 1875
WOB.461	Clement, Albert A. Double House	643-645 Main St	Woburn	c 1880
WOB.462	Buckman, Francis Alvah House	644 Main St	Woburn	c 1885
WOB.463	Buckman, Christina House	646 Main St	Woburn	c 1915
WOB.8	Thompson, Daniel House	649 Main St	Woburn	1760
WOB.464	Thompson, Jonathan House	650 Main St	Woburn	c 1860
WOB.465	Parker, Samuel P. Harness- Upholstery Shop	653 Main St	Woburn	r 1820
WOB.466	Central Square Fire Station	654 Main St	Woburn	1906
WOB.467	Rigby, George Grocery Store	658 Main St	Woburn	c 1880
WOB.14	Guastavino, R. Ceramic Tile Factory and Showroom	660 Main St	Woburn	1907
WOB.468	Flagg, Charles House	662 Main St	Woburn	c 1870
WOB.469	Wyman, Charles Austin House	663 Main St	Woburn	c 1850
WOB.470	Stone, Clinton C. House	664 Main St	Woburn	c 1870
WOB.471		668 Main St	Woburn	c 1880
WOB.472	Wyman, Charles Austin House	670 Main St	Woburn	c 1870
WOB.121	Wyman Grammar School	677 Main St	Woburn	1891
WOB.473	Parker, Josiah House	706 Main St	Woburn	c 1847
WOB.474	Adlington, William - Graham, James R. House	707 Main St	Woburn	c 1840
WOB.475	Tenney, Patrick H. House	750 Main St	Woburn	c 1906
WOB.476	Johnson, Robert - Leen, Henry M. House	751 Main St	Woburn	1922
WOB.12	1790 House	827 Main St	Woburn	c 1790
WOB.44		848 Main St	Woburn	c 1830
WOB.122	Saint Anthony Roman Catholic Church	859 Main St	Woburn	1927
WOB.213	Saint Anthony Roman Catholic Church Garage	859 Main St	Woburn	1927
WOB.942	Virgin Mary Immaculate Conception Statue	859 Main St	Woburn	
WOB.943	Saint Anthony Statue	859 Main St	Woburn	
WOB.944	Knights of Columbus Memorial to the Unborn	859 Main St	Woburn	1995
WOB.123	North Congregational Church	896 Main St	Woburn	1882
WOB.21	Main Street Diner	901 Main St	Woburn	1952
WOB.45	Winn, Col. Moses F. House	903 Main St	Woburn	c 1830
WOB.249		985 Main St	Woburn	c 1970

Inv. No.	Property Name	Street	Town	Year
WOB.247		1011 Main St	Woburn	c 1970
WOB.246		1021 Main St	Woburn	c 1930
WOB.245		1023 Main St	Woburn	c 1920
WOB.243		1037 Main St	Woburn	c 1885
WOB.239		1071R Main St	Woburn	c 1959
WOB.237		1075 Main St	Woburn	c 1963
WOB.236		1077 Main St	Woburn	c 1910
WOB.235		1081 Main St	Woburn	1890
WOB.234		1082 Main St	Woburn	c 1921
WOB.575	Tay, William Jr. - Wood, Robert House	1083 Main St	Woburn	r 1780
WOB.233		1098 Main St	Woburn	c 1985
WOB.232		1100 Main St	Woburn	c 1956
WOB.241		2 Massachusetts Ave	Woburn	c 1900
WOB.242		7 Massachusetts Ave	Woburn	c 1950
WOB.257		2 Merrimac St	Woburn	c 2003
WOB.258		10 Merrimac St	Woburn	c 1967
WOB.945	Middlesex Canal	Middlesex Canal	Woburn	c 1802
WOB.274		2 Middlesex St	Woburn	c 1997
WOB.22	Middlesex Canal Tollkeeper's House	5 Middlesex St	Woburn	c 1802
WOB.909	Mishawum Road Bridge over Route 128	Mishawum Rd	Woburn	1961
WOB.124	Burdett, Charles A. House	7 Mishawum Rd	Woburn	c 1880
WOB.125	Fox, Everett P. House	8 Mishawum Rd	Woburn	c 1895
WOB.126	Richardson, Frank B. House	9 Mishawum Rd	Woburn	c 1895
WOB.127	Beggs, Daniel R. House	11 Mishawum Rd	Woburn	c 1899
WOB.128	Beggs, Thomas G. Jr. House	12 Mishawum Rd	Woburn	c 1920
WOB.129	Blodgett, William E. House	14 Mishawum Rd	Woburn	c 1895
WOB.214	Varney, Lloyd Garage	14 Mishawum Rd	Woburn	c 1965
WOB.130	Fox, John William - Glaser, Charles House	15 Mishawum Rd	Woburn	c 1889
WOB.477	Hovey, Eveline House	17 Mishawum Rd	Woburn	1886
WOB.478	Blodgett, Malcolm House	18 Mishawum Rd	Woburn	1922
WOB.479	Waughn, George W. House	19 Mishawum Rd	Woburn	c 1885
WOB.480	Chute, William Prior Jr. - Johnson, Dexter House	20 Mishawum Rd	Woburn	1917
WOB.481	Dean, Joseph - Bancroft, Hartwell House	21 Mishawum Rd	Woburn	c 1800
WOB.482	Bancroft, Charles H. Double House	23-25 Mishawum Rd	Woburn	c 1890
WOB.483	Tuttle, Samuel L. - Sweetser, Charles A. House	24 Mishawum Rd	Woburn	1870
WOB.484	Mundy, John House	26 Mishawum Rd	Woburn	c 1850
WOB.485	Brooks, Andrew Bigelow House	30 Mishawum Rd	Woburn	c 1850
WOB.486	Vacant Lot	31 Mishawum Rd	Woburn	c 1910

Inv. No.	Property Name	Street	Town	Year
WOB.487	Eames, Henry House	35 Mishawum Rd	Woburn	c 1906
WOB.488	Parker, Robert W. Double House	37-39 Mishawum Rd	Woburn	c 1880
WOB.489	Eames, Henry Martin House	38 Mishawum Rd	Woburn	c 1860
WOB.490	Sleeper, Moses W. - Blye, Harrie House	66 Mishawum Rd	Woburn	c 1880
WOB.900	Montvale Avenue Bridge over B & M Railroad	Montvale Ave	Woburn	1917
WOB.131	Woburn Company G 5th Regiment Armory	29 Montvale Ave	Woburn	1891
WOB.132	Woburn Swedish Evangelical Lutheran Church	29A Montvale Ave	Woburn	1898
WOB.133	Bean, Gilman A. House	47 Montvale Ave	Woburn	1874
WOB.134	Gage, Gawin Riddle House	51 Montvale Ave	Woburn	c 1870
WOB.491	Leighton, F. M. - Johnson, Charles House	65 Montvale Ave	Woburn	c 1870
WOB.135	Skinner, James House	79 Montvale Ave	Woburn	1875
WOB.576	Stabile, Pasquale - Donahue, Mary House	81 Montvale Ave	Woburn	c 1930
WOB.577	Bezatti, Edward House	83 Montvale Ave	Woburn	c 1930
WOB.578	Begley, John House	85 Montvale Ave	Woburn	c 1930
WOB.579	Spencer, Julia - McDonough, Harold House	87 Montvale Ave	Woburn	c 1929
WOB.492	Fowle, J. House	91-93 Montvale Ave	Woburn	c 1850
WOB.580	Hastings, Oliver - Hill, Jotham House	97 Montvale Ave	Woburn	r 1820
WOB.581	Swallow, Rev. J. E. - Taylor, Edward E. House	99 Montvale Ave	Woburn	c 1860
WOB.582	Hall, Capt. George W. M. House	101 Montvale Ave	Woburn	c 1860
WOB.583	Converse, John - Floyd, William House	110 Montvale Ave	Woburn	c 1800
WOB.584	Trull, Dr. Samuel - Yates, James House	111 Montvale Ave	Woburn	c 1856
WOB.585	Maquire, John G. House	113 Montvale Ave	Woburn	c 1887
WOB.136	Pollard, F. - True, John S. House	120 Montvale Ave	Woburn	1871
WOB.586	Moore, Charles - Ford, Howard M. House	129 Montvale Ave	Woburn	c 1850
WOB.587	Barber, Joseph F. - Linnell, Joseph House	133 Montvale Ave	Woburn	c 1870
WOB.588	Stevens, Frank - Brown, Charles A. House	135 Montvale Ave	Woburn	c 1860
WOB.697	Boutelle, Theodore House	138 Montvale Ave	Woburn	c 1890
WOB.698	Bishop, Harry S. - Elson, Alfred House	142 Montvale Ave	Woburn	c 1890
WOB.700	Waisnor, William Double House	144-146 Montvale Ave	Woburn	c 1890
WOB.701	Anderson, Peter House	147 Montvale Ave	Woburn	c 1900
WOB.702	Donovan, James P. House	160 Montvale Ave	Woburn	c 1890
WOB.703	Corry, Robert J. House	162 Montvale Ave	Woburn	c 1916
WOB.704	Johnson, John G. House	166 Montvale Ave	Woburn	c 1890
WOB.589	Tucker, Hannah - Prentice, Daniel House	192 Montvale Ave	Woburn	c 1850
WOB.705	Mahoney, Timothy House	197 Montvale Ave	Woburn	c 1860
WOB.706	Jones, Charles S. House	239 Montvale Ave	Woburn	1889
WOB.707	Pettingill, William House	251 Montvale Ave	Woburn	c 1850
WOB.708	McDonald, Patrick House	269 Montvale Ave	Woburn	1909

Inv. No.	Property Name	Street	Town	Year
WOB.709	Ramsdell, Henry - Cogan, Patrick Double House	284 Montvale Ave	Woburn	c 1860
WOB.590	Woburn Agricultural Manufacturing Boarding House	286 Montvale Ave	Woburn	1837
WOB.591	Woburn Agricultural Manufacturing Boarding House	288 Montvale Ave	Woburn	1837
WOB.592	Woburn Agricultural Manufacturing Boarding House	290 Montvale Ave	Woburn	1837
WOB.593	Woburn Agricultural Manufacturing Boarding House	292 Montvale Ave	Woburn	1837
WOB.699	Bishop, Harry S. - Elson, Alfred Barn	142 Montvale St	Woburn	c 1890
WOB.668	Whitcher, Jacob C. House	8 Mount Pleasant St	Woburn	c 1872
WOB.669	Stewart, Donald W. - Chester, Thomas House	10 Mount Pleasant St	Woburn	c 1875
WOB.670	Stewart, Donald W. Barn	10R Mount Pleasant St	Woburn	c 1875
WOB.671	Oxford, Charles - Bryant, Grace Marion House	47 Mount Pleasant St	Woburn	c 1860
WOB.672	Allen, George W. - Wyer, Capt. Edwin F. House	50 Mount Pleasant St	Woburn	c 1860
WOB.673	Conn, Charles Kyler House	53 Mount Pleasant St	Woburn	c 1865
WOB.137	Conn, George H. - Bickford, Dr. H. C. House	62 Mount Pleasant St	Woburn	1873
WOB.138	Saint Charles Roman Catholic Parish School	8 Myrtle St	Woburn	1921
WOB.288		1 North Warren St	Woburn	c 1920
WOB.594	Ellard - Larkin, John F. House	8 North Warren St	Woburn	r 1820
WOB.595	Murray, Patrick H. - Martin, Philip House	39 North Warren St	Woburn	c 1880
WOB.596	Burbank, Daniel Poultry House	34 Orange St	Woburn	r 1889
WOB.597	New Jerusalem Swedenborgian Chapel	36 Orange St	Woburn	1868
WOB.598	Montvale Congregational Church Parsonage	36 Orange St	Woburn	c 1945
WOB.493	Kenty, Frederick W. House	6 Page Pl	Woburn	c 1900
WOB.494	Sherburne, William Alexander House	8 Page Pl	Woburn	c 1890
WOB.495	Wallace, John M. House	10 Page Pl	Woburn	c 1890
WOB.496	Page, Catherine - Robinson, Albert H. House	11 Page Pl	Woburn	c 1870
WOB.497	Wallace, John M. - Crowell, Clarence M. House	12 Page Pl	Woburn	c 1890
WOB.498	Robinson, Carrie Page House	13 Page Pl	Woburn	c 1906
WOB.499	Burnes, Clara M. House	14 Page Pl	Woburn	c 1930
WOB.500	Robinson, Carrie Page Double House	15-17 Page Pl	Woburn	c 1890
WOB.800	Woburn First Burial Ground	Park St	Woburn	1642
WOB.917	Woburn First Burial Ground Perimeter Wall	Park St	Woburn	r 1850
WOB.918	Woburn First Burial Ground Chain Link Fence	Park St	Woburn	r 1980
WOB.919	Woburn First Burial Ground Path, Plaza & Flagpole	Park St	Woburn	r 1980
WOB.920	First Burial Ground - Convers, Ann Headstone	Park St	Woburn	c 1691
WOB.921	First Burial Ground - Thomson, Lt. James Headstone	Park St	Woburn	c 1693

Inv. No.	Property Name	Street	Town	Year
WOB.922	First Burial Ground - Wyman, Francis Headstone	Park St	Woburn	c 1699
WOB.923	First Burial Ground - Johnson, Sarah Headstone	Park St	Woburn	c 1710
WOB.924	First Burial Ground - Fyfeild, Abraham Headstone	Park St	Woburn	c 1711
WOB.925	First Burial Ground - Richardson, Samuel Headstone	Park St	Woburn	c 1712
WOB.926	First Burial Ground - Burbeen, John Headstone	Park St	Woburn	c 1713
WOB.927	First Burial Ground - Wyman, Benjamin Headstone	Park St	Woburn	c 1774
WOB.928	First Burial Ground - Thompson, Daniel Headstone	Park St	Woburn	c 1775
WOB.929	First Burial Ground - Gardner, Dorothy Headstone	Park St	Woburn	c 1787
WOB.930	First Burial Ground - Pool, Eleazar F. Headstone	Park St	Woburn	c 1776
WOB.931	First Burial Ground - Brook, Benjamin Headstone	Park St	Woburn	c 1769
WOB.932	First Burial Ground - Wyman, Abigail Headstone	Park St	Woburn	c 1772
WOB.933	First Burial Ground - Tyng, Judith Headstone	Park St	Woburn	c 1736
WOB.934	First Burial Ground - Baldwin Family Obelisk	Park St	Woburn	r 1820
WOB.935	First Burial Ground - Fowle, James Monument	Park St	Woburn	c 1856
WOB.936	First Burial Ground - Commemorative Plaques	Park St	Woburn	r 1980
WOB.28	Downing, Jonathan - Parkhurst, George House	48 Pearl St	Woburn	c 1860
WOB.29	Tuttle, Mary - White, Hugh House	52 Pearl St	Woburn	c 1870
WOB.139	Locke House	61 Pearl St	Woburn	c 1800
WOB.215	Locke Barn	61 Pearl St	Woburn	
WOB.30	Reed, Moses D. - Howard, J. P. House	66 Pearl St	Woburn	r 1835
WOB.31	Thayer, Howard - Duffy, Thomas E. Double House	68 Pearl St	Woburn	c 1910
WOB.32	Eaton, Edwin House	70 Pearl St	Woburn	c 1870
WOB.33	Green, Charles B. House	72 Pearl St	Woburn	r 1865
WOB.140	Page, John O. - Hall, Charles A. House	76 Pearl St	Woburn	c 1800
WOB.141	Poole, Rufus F. House	88 Pearl St	Woburn	c 1890
WOB.142	Tidd, Jonathan House	89 Pearl St	Woburn	c 1700
WOB.216	Watson, Abby Tidd Garage	89 Pearl St	Woburn	r 1920
WOB.143	Fridolin, Julius Double House	90 Pearl St	Woburn	c 1906
WOB.144	Andersen, M. Peter House	94 Pearl St	Woburn	1914
WOB.145	Pierce, Andrew House	108 Pearl St	Woburn	c 1840
WOB.146	Greenan, William Double House	121 Pearl St	Woburn	r 1900
WOB.147	Carter, Alfred G. House	125 Pearl St	Woburn	c 1870
WOB.599	Hermann, Alfred House	16 Pine St	Woburn	1914
WOB.600	Leech, Henry E. House	20 Pine St	Woburn	1923

Inv. No.	Property Name	Street	Town	Year
WOB.601	Wright, Thomas J. - Cornett, Frank House	40 Pine St	Woburn	c 1904
WOB.501	Kent, George House	100 Pine St	Woburn	c 1925
WOB.602	Place, Griffin - Cook, William House	7 Place Ln	Woburn	r 1780
WOB.148	Woburn Congregational Church	1 Pleasant St	Woburn	r 1850
WOB.149	Woburn Five Cents Savings Bank	19 Pleasant St	Woburn	1931
WOB.6	Woburn Public Library	45 Pleasant St	Woburn	c 1876
WOB.906	Count Rumford Statue	45 Pleasant St	Woburn	1899
WOB.150	Craigin, Francis K. Double House	57 Pleasant St	Woburn	c 1870
WOB.283		61 Pleasant St	Woburn	c 1900
WOB.284		69 Pleasant St	Woburn	c 1910
WOB.287		71 Pleasant St	Woburn	c 1950
WOB.151	Winn, Joseph House	73 Pleasant St	Woburn	c 1860
WOB.152	West - Chute, William Prior House	82 Pleasant St	Woburn	c 1880
WOB.217	West - Chute, William Carriage House	82 Pleasant St	Woburn	c 1880
WOB.153	Gifford, Seth T. House	83 Pleasant St	Woburn	c 1880
WOB.154	Pierce, Maj. Thomas Jefferson House	84 Pleasant St	Woburn	c 1870
WOB.155	Crosby, Rufus P. House	85 Pleasant St	Woburn	c 1870
WOB.603	Winn, Joseph B. House	96 Pleasant St	Woburn	c 1840
WOB.156	Winn, William H. House	103 Pleasant St	Woburn	c 1850
WOB.157	Leonard, Christopher Double House	105-107 Pleasant St	Woburn	c 1880
WOB.604	Trull, George - Bacon, Mary B. House	106 Pleasant St	Woburn	c 1840
WOB.605	Chickering, Rev. Joseph - Bacon, Oliver House	115 Pleasant St	Woburn	c 1810
WOB.158	Dow, Stephen - Ellis, George F. House	131 Pleasant St	Woburn	c 1840
WOB.606	Thompson, Abijah - Dow, Stephen House	132 Pleasant St	Woburn	c 1825
WOB.502	Lyons, Thomas F. House	136 Pleasant St	Woburn	1933
WOB.159	Doyle, John B. House	137 Pleasant St	Woburn	c 1850
WOB.503	Finn, George House	138 Pleasant St	Woburn	1933
WOB.504	Simonds, Marshall House	143 Pleasant St	Woburn	c 1890
WOB.505	Thompson, Benjamin Franklin - Frost, Walter House	146 Pleasant St	Woburn	c 1820
WOB.506	Symmes, Zachariah - Doherty, John N. House	147 Pleasant St	Woburn	c 1815
WOB.160	Clark, George F. House	149 Pleasant St	Woburn	1846
WOB.507	Johnson, Joseph House	151 Pleasant St	Woburn	1846
WOB.508	Buss, Dr. Charles H. House	15 Plympton St	Woburn	1913
WOB.674	Hudson, Edward W. - Keany, Terrence House	34 Porter St	Woburn	r 1860
WOB.675	Whitcher, Jacob C. - Began, Timothy House	42 Prospect St	Woburn	r 1873
WOB.161	Cole, John G. - Giles, Royal House	62 Prospect St	Woburn	c 1856
WOB.162	Ferullo, Luigi House	7 Richmond Ave	Woburn	c 1900

Inv. No.	Property Name	Street	Town	Year
WOB.218	Ferullo Garage	7 Richmond Ave	Woburn	c 1980
WOB.908	Route 128 Bridge over Route 38 (Westbound)	Rt 128	Woburn	1949
WOB.910	Route 128 Bridge over Boston and Maine Railroad	Rt 128	Woburn	1950
WOB.911	Route 128 Bridge over Route 38 (Eastbound)	Rt 128	Woburn	1949
WOB.912	Route 128 Bridge over Aberjona River	Rt 128	Woburn	1949
WOB.916	Walnut Hill Bridge	Salem St	Woburn	1928
WOB.163	Converse, Parker Lindall House	10 Salem St	Woburn	c 1870
WOB.219	Converse, Parker Lindall Outbuilding	10 Salem St	Woburn	c 1870
WOB.164	Perry, Florence Clemson House	178 Salem St	Woburn	c 1920
WOB.165	Heald, Walter House	184 Salem St	Woburn	c 1916
WOB.166	Maplewood Farm	372 Salem St	Woburn	c 1910
WOB.220	Hayward, Martin Barn	372 Salem St	Woburn	c 1850
WOB.221	Schneider Dairy Farm Milkhouse	372 Salem St	Woburn	c 1910
WOB.222	Maplewood Farm Blacksmith Shop	372 Salem St	Woburn	
WOB.710	McFeeley, James House	36 School St	Woburn	c 1871
WOB.711	Ames, Henry Lyman House	170 School St	Woburn	r 1830
WOB.607	Thompson, Lewis Waldo - McMahon, Frank House	10 Scott St	Woburn	c 1885
WOB.608	Thompson, Lewis Waldo - Rooney, Henry J. House	12 Scott St	Woburn	c 1900
WOB.609	Thompson, Lewis Waldo - Clemson, Frederick House	14 Scott St	Woburn	c 1900
WOB.610	Thompson, Lewis Waldo - Carr, Alice House	16 Scott St	Woburn	c 1900
WOB.611	Deland, Joseph Foster House	19-21 Scott St	Woburn	c 1874
WOB.612	Wyman, Nathan House	22 Scott St	Woburn	c 1865
WOB.613	MacDonald, John House	31 Scott St	Woburn	c 1919
WOB.676	Barker, George G. - Campbell, Donald House	14 South St	Woburn	c 1895
WOB.167	DeLong, James F. Three Decker	11 Sturgis St	Woburn	r 1915
WOB.712	Wyman, William P. House	14 Sturgis St	Woburn	c 1850
WOB.713	Hudson, Edward W. House	30 Sturgis St	Woburn	c 1875
WOB.169	Ray, George House	3 Tidd Ave	Woburn	c 1890
WOB.37	Pierce, Charles A. Carriage House	4 Tidd Ave	Woburn	c 1900
WOB.170	Torry, Richard - Veno, George House	5 Tidd Ave	Woburn	c 1890
WOB.171	Bond, Daniel Wilbur House	6 Tidd Ave	Woburn	c 1902
WOB.172	Healey, Francis C. House	1 Traverse St	Woburn	c 1900
WOB.223	Healey, Francis C. Garage	1 Traverse St	Woburn	
WOB.173	Cutler, Warren - Thompson, Jonathan House	7 Traverse St	Woburn	c 1860
WOB.174	Tidd, Marshall - Flint, Frederick House	19 Traverse St	Woburn	c 1870

Inv. No.	Property Name	Street	Town	Year
WOB.224	Bond, Lewis F. Garage	19 Traverse St	Woburn	c 1926
WOB.175	Hartshorn, S. A. House	60 Union St	Woburn	c 1880
WOB.509	Murphy, James H. House	6 Valley Rd	Woburn	1925
WOB.285		1 Wade Pl	Woburn	c 1920
WOB.286		1 Wade Pl	Woburn	c 1910
WOB.282		7 Wade Pl	Woburn	c 1920
WOB.714	Menchin, Frank House	96 Waltham St	Woburn	1894
WOB.176	Foucar, Mary M. House	4 Ward St	Woburn	c 1906
WOB.225	Foucar, Mary M. Garage	4 Ward St	Woburn	
WOB.177	Merrill, William R. House	6 Ward St	Woburn	c 1870
WOB.226		6 Ward St	Woburn	
WOB.178	Carlberg, Carl House	9 Ward St	Woburn	c 1906
WOB.38	Tidd, Marshall House	11 Ward St	Woburn	r 1820
WOB.179	Tidd, Arthur W. House	15 Ward St	Woburn	c 1910
WOB.180	Edgecomb, Noah House	18 Ward St	Woburn	c 1848
WOB.181	Tidd, Jonathan House	23 Ward St	Woburn	c 1870
WOB.182	Bond, Charles House	30 Ward St	Woburn	c 1870
WOB.227	Colvin, John Garage	30 Ward St	Woburn	1918
WOB.289	Thompson, Jonathan - Tidd, Marshall House	1 Warren Ave	Woburn	c 1835
WOB.183	Grammer, Col. William T. House	14 Warren Ave	Woburn	c 1875
WOB.18	Hayden, Edward D. House	17 Warren Ave	Woburn	c 1892
WOB.184	Munroe, John I. House	26 Warren Ave	Woburn	1894
WOB.185	Dow, Alfred A. House	31 Warren Ave	Woburn	c 1870
WOB.186	Fagg, Stephen D. House	35 Warren Ave	Woburn	c 1910
WOB.228	Fagg, Stephen D. Garage	35 Warren Ave	Woburn	c 1910
WOB.187	Nichols, Benjamin Harrison House	37 Warren Ave	Woburn	c 1890
WOB.188	Duncan, Robert - Barker, E. Gerry House	39 Warren Ave	Woburn	c 1890
WOB.189	Munroe, George J. House	43 Warren Ave	Woburn	c 1870
WOB.229	Munroe, George J. Garage	43 Warren Ave	Woburn	c 1870
WOB.190	Crane, Capt. John P. House	48 Warren Ave	Woburn	c 1875
WOB.614	Wyman, Amasa - Allen, George W. House	150 Washington Cir	Woburn	r 1780
WOB.615	Hadley - Allen, George W. House	152 Washington Cir	Woburn	c 1800
WOB.628	Anshei Poland Cemetery Chapel	Washington St	Woburn	1922
WOB.629	Congregation Ohel Jacob Cemetery Chapel	Washington St	Woburn	
WOB.630	Chevra Kadusha of Boston Cemetery Chapel	Washington St	Woburn	c 1903
WOB.631	Pride of Boston Cemetery Chapel	Washington St	Woburn	c 1980
WOB.632	Shari Jerusalem Chevra Thilim Cemetery Chapel	Washington St	Woburn	
WOB.633	Anshe Libavitz Cemetery Chapel	Washington St	Woburn	

Inv. No.	Property Name	Street	Town	Year
WOB.634	Knights of Liberty Cemetery Chapel	Washington St	Woburn	1941
WOB.801	Anshei Poland Cemetery	Washington St	Woburn	c 1900
WOB.802	Beth Joseph #1 Cemetery	Washington St	Woburn	c 1908
WOB.803	Meretz Cemetery	Washington St	Woburn	1893
WOB.804	Beth David Cemetery	Washington St	Woburn	c 1906
WOB.805	Beth David #2 Cemetery	Washington St	Woburn	c 1906
WOB.806	Montefiore Cemetery	Washington St	Woburn	c 1906
WOB.807	Chebra Kadisha of Chelsea Cemetery	Washington St	Woburn	c 1899
WOB.808	Congregation Ohel Jacob and East Boston Cemetery	Washington St	Woburn	c 1906
WOB.809	South Boston Lodge Cemetery	Washington St	Woburn	c 1906
WOB.810	Roxbury Mutual Cemetery	Washington St	Woburn	c 1898
WOB.811	Kenesseth Israel Cemetery	Washington St	Woburn	c 1899
WOB.812	Chevra Kadusha of Boston Cemetery	Washington St	Woburn	c 1903
WOB.813	United Congregation Beth Jacob Cemetery	Washington St	Woburn	c 1902
WOB.814	Puritan - Mount Sinai Cemetery	Washington St	Woburn	c 1906
WOB.815	Pride of Boston Cemetery A	Washington St	Woburn	c 1897
WOB.816	Pride of Boston Cemetery B	Washington St	Woburn	c 1897
WOB.817	Pride of Boston Cemetery C	Washington St	Woburn	c 1897
WOB.818	Pride of Boston Cemetery D	Washington St	Woburn	c 1897
WOB.819	Agudath Achim Cemetery	Washington St	Woburn	c 1906
WOB.820	Shari Jerusalem Chevra Thilim Cemetery	Washington St	Woburn	c 1906
WOB.821	Anshe Libavitz Cemetery	Washington St	Woburn	c 1899
WOB.822	Woburn Hebrew Center Cemetery	Washington St	Woburn	c 1945
WOB.823	Beth Joseph #3 Cemetery	Washington St	Woburn	c 1906
WOB.824	Knights of Liberty Cemetery	Washington St	Woburn	c 1903
WOB.825	Independent Pride of Boston Cemetery	Washington St	Woburn	c 1900
WOB.826	Independent Golden Crown Cemetery	Washington St	Woburn	c 1906
WOB.827	American Austrian - City of Boston Lodge Cemetery	Washington St	Woburn	c 1906
WOB.828	Chevra Mishnias Cemetery	Washington St	Woburn	c 1906
WOB.946	Anshei Poland Cemetery Gate and Fence	Washington St	Woburn	
WOB.947	Meretz Cemetery Gate and Fence	Washington St	Woburn	c 1914
WOB.948	Beth David #2 Cemetery Gate and Fence	Washington St	Woburn	
WOB.949	Beth Joseph Cemetery #2 - Wolkon, Rose Tablet	Washington St	Woburn	c 1974
WOB.950	Montefiore Cemetery Gate - Fence - Tablets	Washington St	Woburn	1924
WOB.951	Chebra Kadisha of Chelsea Cemetery Gate	Washington St	Woburn	
WOB.952	Chebra Kadisha of Chelsea Cemetery Fence	Washington St	Woburn	

Inv. No.	Property Name	Street	Town	Year
WOB.953	Congregation Ohel Jacob Cemetery Gate and Fence	Washington St	Woburn	
WOB.954	South Boston Lodge Cemetery Gate and Fence	Washington St	Woburn	
WOB.955	Roxbury Mutual Cemetery Gate and Fence	Washington St	Woburn	1930
WOB.956	Kenesseth Israel Cemetery Gate and Fence	Washington St	Woburn	
WOB.957	Kenesseth Israel Cemetery Tablets	Washington St	Woburn	1899
WOB.958	Kenesseth Israel Cemetery Tablet	Washington St	Woburn	1899
WOB.959	Kenesseth Israel Cemetery Tablet	Washington St	Woburn	1899
WOB.960	Chevra Kadusha of Boston Cemetery Gate and Fence	Washington St	Woburn	1925
WOB.961	United Congregation Beth Jacob Cemetery Gate	Washington St	Woburn	c 1970
WOB.962	Puritan - Mount Sinai Cemetery Gate and Fence	Washington St	Woburn	
WOB.963	Pride of Boston Cemetery Gate and Wall	Washington St	Woburn	c 1930
WOB.964	Pride of Boston Cemetery Gate and Fence	Washington St	Woburn	
WOB.965	Agudath Achim Cemetery Gate and Fence	Washington St	Woburn	
WOB.966	Shari Jerusalem Chevra Thilim Cemetery Gate	Washington St	Woburn	
WOB.967	Anshe Libavitz Cemetery Gate	Washington St	Woburn	
WOB.968	Anshe Libavitz Cemetery Fence	Washington St	Woburn	
WOB.969	Woburn Hebrew Center Cemetery Gate and Plaque	Washington St	Woburn	1945
WOB.970	Beth Joseph #3 Cemetery Gates	Washington St	Woburn	
WOB.971	Beth Joseph #3 Cemetery Marker	Washington St	Woburn	
WOB.972	Knights of Liberty Cemetery Fence	Washington St	Woburn	
WOB.973	Independent Pride of Boston Cemetery Tablet	Washington St	Woburn	1900
WOB.974	Independent Pride of Boston Cemetery Tablet	Washington St	Woburn	1931
WOB.975	Independent Golden Crown Cemetery Gate	Washington St	Woburn	
WOB.976	American Austrian Cemetery Gate	Washington St	Woburn	1922
WOB.977	City of Boston Lodge Cemetery Gate and Fence	Washington St	Woburn	
WOB.978	Chevra Mishnias Cemetery Gate and Fence	Washington St	Woburn	
WOB.616	Hayward, Nathaniel - Macfarlane, Duncan House	72 Washington St	Woburn	c 1840
WOB.25	Saint Joseph's Roman Catholic Church	100 Washington St	Woburn	1877
WOB.937	Immaculate Conception Statue	100 Washington St	Woburn	1926
WOB.938	Saint Jude Statue	100 Washington St	Woburn	
WOB.939	Gillis, Shawn - Carroll, Paul Monument	100 Washington St	Woburn	
WOB.617	Knights, John II - Nelson, James House	10 Water St	Woburn	c 1840
WOB.618	Eaton, Timothy - Devlin, John House	12 Water St	Woburn	r 1840
WOB.256		10 West Dexter Ave	Woburn	c 1983
WOB.191	Thompson, Samuel A. House	7 West St	Woburn	c 1885
WOB.192	Lyng, Arthur House	11 West St	Woburn	c 1932

Inv. No.	Property Name	Street	Town	Year
WOB.193	Flaws, James House	16 West St	Woburn	c 1930
WOB.194	Bell, James D. - Rollins, Elijah Jr. House	25 West St	Woburn	c 1860
WOB.195	Fowle, James House	26 West St	Woburn	c 1920
WOB.196	Sevrens, Urial House	30 West St	Woburn	c 1895
WOB.244		2 Wheeling St	Woburn	c 1940
WOB.510	Cummings, Lottie - Wilcox, Walter L. House	6 Wilcox Cir	Woburn	1898
WOB.511	Cummings, M. - Newman, John Hawkins House	74 Willow St	Woburn	c 1870
WOB.512	Taylor, Sewell 2nd House	75 Willow St	Woburn	1864
WOB.513	Colgate, William A. - Aylward, Michael J. House	78 Willow St	Woburn	1851
WOB.620	Winn and Lane Row House	Winn Pk	Woburn	c 1880
WOB.619	Winn and Lane Row House	2-12 Winn Pk	Woburn	c 1880
WOB.197	Woburn First Baptist Church	3 Winn St	Woburn	1926
WOB.621	Woburn First Baptist Church Parsonage	7 Winn St	Woburn	c 1895
WOB.35	Tillson, David H. House	56 Winn St	Woburn	c 1850
WOB.275		100 Winn St	Woburn	c 1964
WOB.622	Henchey, James H. House	122 Winn St	Woburn	c 1880
WOB.623	Ryan, John J. House	126 Winn St	Woburn	1913
WOB.624	Barnes, James - O'Hare, Fannie Double House	127-129 Winn St	Woburn	c 1890
WOB.625	Boviard, James - Palage, Harry House	131 Winn St	Woburn	c 1929
WOB.198	Caulfield, Dr. Peter House	160 Winn St	Woburn	1908
WOB.514	Richardson, S. S. House	2 Wyman St	Woburn	c 1840
WOB.626	Wheaton, Frank E. House	7 Wyman St	Woburn	c 1924
WOB.627	Chute, Susan - Cummings, Joanna House	21 Wyman St	Woburn	c 1925

Appendix F

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 contaminates 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).

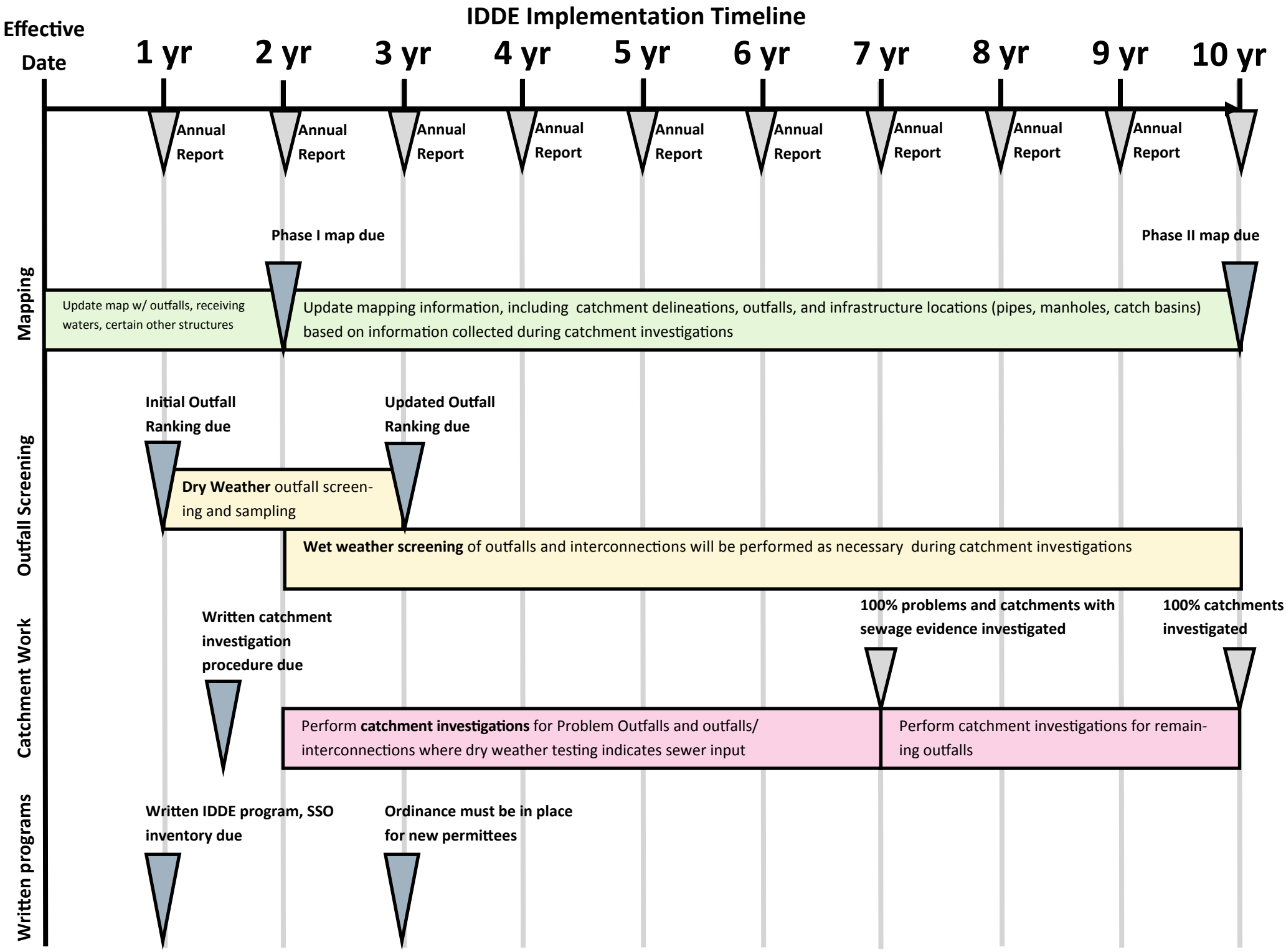
Source: California Stormwater Quality Association, Stormwater BMP Handbook, 2003.

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/)										


IDDE Implementation Timeline
Effective Date
1 yr
2 yr
3 yr
4 yr
5 yr
6 yr
7 yr
8 yr
9 yr
10 yr
Annual Report
Mapping
Phase I map due
Phase II map due
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
Outfall Screening
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
Catchment Work
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 programs
Written IDDE program, SSO inventory due
Ordinance must be in place for new permittees

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) <u>OR</u> 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.

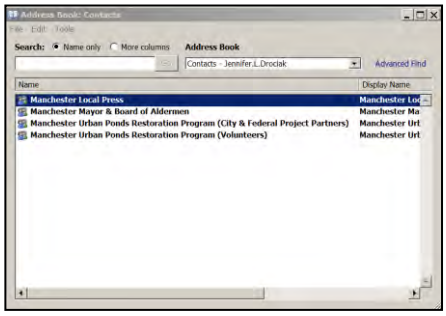
The UPRP has partnered with the Student Conservation Association, local high school ecology clubs, local boy-scout troops, trout-fishing clubs, geo-cashing groups, and others in the past. This has helped garner additional / new volunteers.

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 repellant, water) and what to do in case of bad weather (rain date or cancellation information / phone number).

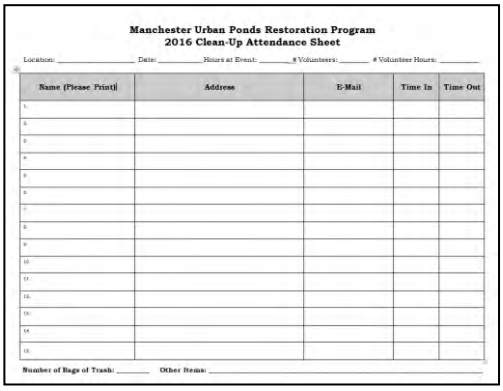
For Example: Seeking volunteers of all ages to assist in an annual trash clean-up at Black Brook and Blodget Park in Manchester on Saturday, April 23, 2016 from 9:00AM – 11:00AM. Volunteers will partner to clean the park and skirt the edges of the brook and wetland complex to remove accumulated trash. 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 safely concerns that may have accrued / arisen since your last visit.

The UPRP coordinator(s) typically meet on-site approximately 15-30 minutes in advance of volunteers to set up trash bags, latex gloves, and the "Clean-Up Attendance Sheet". We also survey the site to identify any new trash or safety hazards to relay to volunteers.

B. Welcome Your Volunteers and Ask Them to Sign-In: Welcome each volunteer upon arrival and ask that they sign a "Clean-Up Attendance Sheet" so that your group may account for number of volunteers and volunteer hours contributed to the clean-up event. Consider leaving the "Clean-Up Attendance Sheet" at the check-in location for those volunteers who may have to leave (and sign out) earlier than the full allotted time.



Manchester Urban Ponds Restoration Program
2016 Clean-Up Attendance Sheet

Location: _____ Date: _____ Hours at Event: _____ # Volunteers: _____ # Volunteer Hours: _____

	Name (Please Print)	Address	E-Mail	Time In	Time Out
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					

Number of Bags of Trash: _____ Other Items: _____

The UPRP "Clean-Up Attendance Sheet" typically notes the location and date of the event, and has room to tally the number of volunteers, number of volunteer hours, number of bags of trash and other debris. It also has fields for volunteers to print their name, address, and e-mail, and note the time they checked in, and the time they checked out.

C. Ask Volunteers to Sign a Liability Waiver and Photo-Release Form: Trash found in a waterbody will likely be dirty, rusty, slimy, and sharp. In addition, your group may find broken glass, hypodermic needles and hazardous wastes. Heavy items should not be lifted alone. Caution is needed when handling all trash in order to avoid cuts and other injuries. Consider asking volunteers to sign a liability waiver and photo-release form. These can be two documents, or combined into one. The form should explain any dangers associated with the clean-up event and reminds volunteers to act responsibly for their own safety. The form helps protect you and your organization from potential liability if a volunteer is injured. In addition, with their permission, it allows you to use photographs taken that day. Examples of these forms can be found on-line.

D. Introduce Yourself and Provide Opening Remarks: Introduce yourself, thank special guests, sponsors / project partners (who have helped by providing goods or services), and volunteers. If the media is there, they may want to interview you or for you to provide a brief quote. Consider preparing remarks ahead-of-time, and allowing any special guests to also provide opening remarks to the group.

The UPRP coordinators typically introduce themselves, and thank any special guests (city aldermen, city employees, etc.), sponsors (municipal and local), and volunteers themselves.

E. Provide Volunteers with a Brief Background / History of the Area(s): To acquaint new volunteers to your group / program and to the area, consider providing a brief background / history about the waterbody / area, distinguishing features, and its importance to the community. Consider showing volunteers a map of the waterbody and / or watershed. Also consider providing information such as points of interest, recent (or upcoming) restoration projects in the area, and / or information relative to water quality / monitoring, exotic species, other volunteer opportunities, etc.

Many of the UPRP volunteers are returning volunteers. However, with any new volunteers, we typically offer basic information on the program itself, as well as the watershed, inlet / outlet, history fun-facts, and any recent / upcoming restoration projects. We have fact sheets on each of our ponds on our website, which we can also direct them to for more information.

Manchester Urban Ponds Restoration Program

Nutts Pond Facts

Manchester Urban Ponds Restoration Program

The History of Nutts Pond

Manchester Urban Ponds Restoration Program

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 an 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.

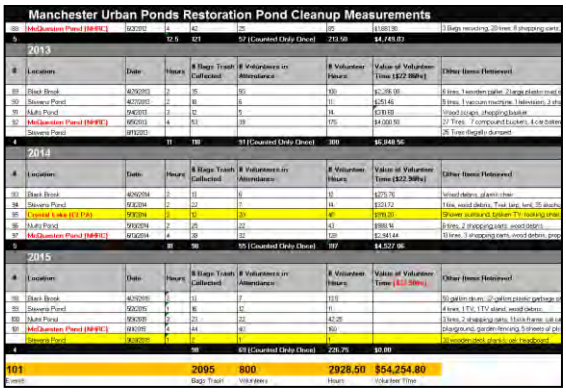
Above Right: Cake served to volunteers at the 100th official cleanup of the Manchester Urban Ponds Restoration Program .

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.

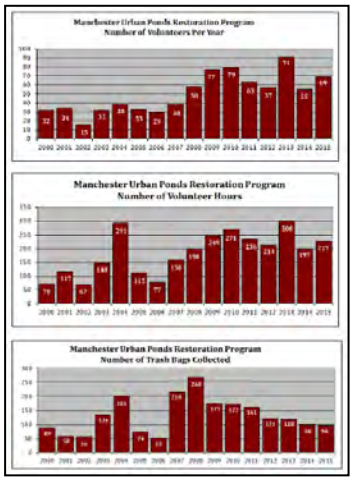
Step 7: Follow Up After the Clean-Up Event

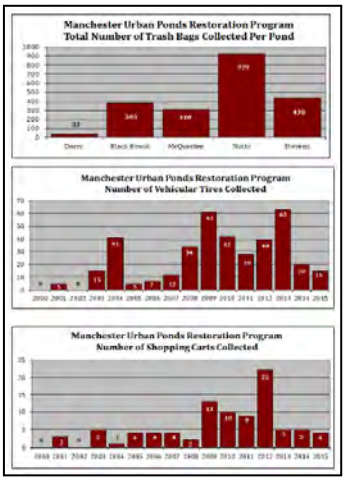
A. Update Your Electronic Records: Now is the time to transpose the information collected on the "Clean-Up Attendance Sheet" into an electronic record-retention system if you have access to one. Perhaps you have access to a database. If not, consider using a Microsoft Excel workbook / spreadsheet system 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 ($22.96/hr)	Other Items Retrieved
	2013							
99	Black Brook	4/6/2013	2	35	90	180	$2,206.80	6 tires, 1 wooden pallet, 2 large plastic mats
100	Stevens Pond	4/7/2013	2	16	6	11	$251.46	5 tires, 1 vacuum machine, 1 television, 2 she
101	Mutts Pond	5/4/2013	3	12	5	14	$310.53	Wood scraps, shopping basket
102	McQuesten Pond (MHPEC)	6/5/2013	4	53	39	175	$4,000.50	37 Tires, 7 compound buckets, 4 cb bikes
	Stevens Pond	8/11/2013						25 Tires illegally dumped.
4			11	130	59 (Counted Only Once)	380	$8,848.56	
	2014							
97	Black Brook	4/26/2014	2	11	6	12	$275.76	Wood debris, plastic chair
98	Stevens Pond	5/3/2014	2	22	7	14	$321.72	1 tire, wood debris, Trash bag, yard, 35 plastic
99	Crystal Lake (CL) Park	5/3/2014	3	10	20	60	$1,378.20	Shower surround, Splash TV, bathing suit
100	Mutts Pond	5/10/2014	2	25	22	43	$988.16	8 tires, 2 shopping carts, wood debris
101	McQuesten Pond (MHPEC)	6/14/2014	4	28	32	128	$2,941.44	13 tires, 3 shopping carts, wood debris, prop
5			13	96	55 (Counted Only Once)	197	$4,527.06	
	2015							
98	Black Brook	4/25/2015	2	11	7	13.5		50 gallon drum, 2 gallon plastic garbage pail
99	Stevens Pond	5/2/2015	3	16	12	31		4 tires, 1 TV, TV stand, wood debris
100	Mutts Pond	5/9/2015	3	21	22	47.25		3 tires, 2 shopping carts, 1 bike frame, tub ca
101	McQuesten Pond (MHPEC)	6/6/2015	4	44	40	160		playground, garden fencing, 5 sheets of pla
	Stevens Pond	9/5/2015	1	1	1	1		12 wooden deck planks, 1 oak headboard
4			13	93	69 (Counted Only Once)	220.75	$0.00	
101				2095	800	2928.50	$54,254.80	
Event:				Bags Trash	Volunteers	Hours	Volunteer Time	





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.

Appendix G

Sanitary Sewer Overflow Inventory

Draft SSO Inventory for the City of Woburn, MA (January 1, 2014 – May 22, 2019)

Summary table:

Date	Time	Location	Discharge to surface water or MS4	Estimated SSO Volume	Cause of SSO	Mitigation / Corrective Measures Completed
12/09/2014	06:45pm – 09:30pm	Sturgis Street	Horn Pond	16,500 gallons	Rain Event, Insufficient Capacity in the System	Area bermed and constrained by DPW to prevent discharge to Pond.
01/08/2017	01:20pm – 02:20pm	SMH HP-19; behind 58 Sturgis Street	Horn Pond	375 gallons	Due to contractor operations	Contractor corrected problems with their pumps.

Detailed descriptions:

- No SSOs occurred in 2019
- No SSOs occurred in 2018
- On **January 8, 2017** at approximately 01:20 PM, the Sewer Department was notified of sewage coming out of a manhole in the walking path behind 58 Sturgis Street. A contractor was working on the Horn Pond lining project downstream of the manhole. At the time of discharge, the contractor had the line plugged and temporary bypass in place. However, the contractor had problems with the bypass pumps which resulted in the discharge. A backup also occurred into the property basement at 51 Sturgis Street. The total volume of wastewater discharged to the area surrounding Horn Pond was 375 gallons.
- No SSOs occurred in 2016
- No SSOs occurred in 2015
- On **December 9, 2014** at approximately 06:45 PM, the Sewer Department was notified of sewage coming out of a manhole on Sturgis Street. After responding and investigating, it was determined there was insufficient capacity in the system to convey flow during the rain storm at that time. Department of Public Works staff bermed the area and maintained the constraint to prevent discharge to the Pond. The total volume of wastewater discharged to the area of Horn Pond was approximately 16,500 gallons. The reason for the SSO was a rainstorm which cumulated 4.21 inches of rain during the duration of the storm. This surcharged the system and caused the SSO event.

Appendix H

Annual Reports & Record Keeping

Annual Evaluation

Year 1 Annual Report

Document Name and/or Web Address:

Year 2 Annual Report

Document Name and/or Web Address:

Year 3 Annual Report

Document Name and/or Web Address:

Year 4 Annual Report

Document Name and/or Web Address:

Year 5 Annual Report

Document Name and/or Web Address:

Appendix I

Plan Amendment Log

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			