Stormwater Management Program (SWMP)

Town of Bellingham

26 Blackstone Street MA 02019

EPA NPDES Permit Number MAR041091

Updated October 2024

This Stormwater Management Plan is based on the EPA's Template and is designed to be updated annually based on the progress of the Town's Stormwater Management Program. Tighe & Bond has added language and information and made minor adjustments to the template based on our best professional judgement. Page numbers have not been noted in the Table of Contents below because they will change annually.

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J:\B\B0852 Bellingham MS4 Engineering\013 FY24 Stormwater Assistance\PY5 Annual Report\SWMP Update\SWMP TOC_2024.docx

Certification

Authorized Representative (Optional): All reports, including SWPPPs, inspection reports, annual reports, monitoring reports, reports on training and other information required by this permit must be signed by a person described in Appendix B, Subsection 11.A or by a duly authorized representative of that person in accordance with Appendix B, Subsection 11.B. If there is an authorized representative to sign MS4 reports, there must be a signed and dated written authorization.
The authorization letter is:

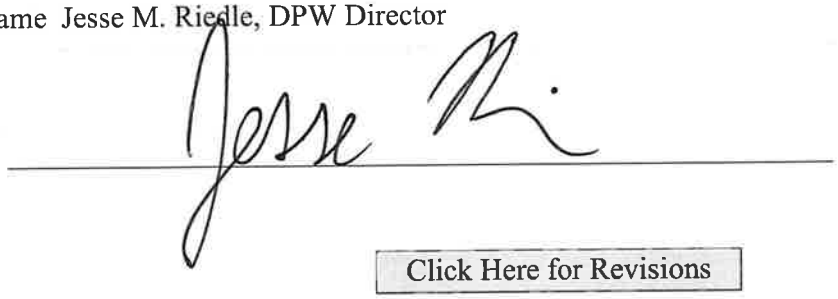
☒ Attached to this document (document name listed below)

Delegation of Authority (Attached in Appendix A)

☐ Publicly available at the website below

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

Printed Name Jesse M. Riedle, DPW Director

Signature  Date 4/12/24

Click Here for Revisions

Background

Stormwater Regulation

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

Permit Program Background

On May 1, 2003, EPA Region 1 issued its Final General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (2003 small MS4 permit) consistent with the Phase II rule. The 2003 small MS4 permit covered "traditional" (i.e., cities and towns) and "non-traditional" (i.e., Federal and state agencies) MS4 Operators located in the states of Massachusetts and New Hampshire. This permit expired on May 1, 2008 but remained in effect until operators were authorized under the 2016 MS4 general permit, which became effective on July 1, 2018.

Stormwater Management Program (SWMP)

The SWMP describes and details the activities and measures that will be implemented to meet the terms and conditions of the permit. The SWMP accurately describes the permittees plans and activities. The document should be updated and/or modified during the permit term as the permittee's activities are modified, changed or updated to meet permit conditions during the permit term. The main elements of the stormwater management program are (1) a public education program in order to affect public behavior causing stormwater pollution, (2) an opportunity for the public to participate and provide comments on the stormwater program (3) a program to effectively find and eliminate illicit discharges within the MS4 (4) a program to effectively control construction site stormwater discharges to the MS4 (5) a program to ensure that stormwater from development projects entering the MS4 is adequately controlled by the construction of stormwater controls, and (6) a good housekeeping program to ensure that stormwater pollution sources on municipal properties and from municipal operations are minimized.

Town Specific MS4 Background (optional)

Attached in Appendix B.

Small MS4 Authorization

The NOI was submitted on Sep 28, 2018

The NOI can be found at the following (document name or web address):

https://www3.epa.gov/region1/npdes/stormwater/ma/tms4noi/bellingham.pdf AND Attached in Appendix C.

Authorization to Discharge was granted on Mar 5, 2019

The Authorization Letter can be found (document name or web address):

https://www3.epa.gov/region1/npdes/stormwater/ma/tms4noi/bellingham-auth.pdf AND Attached in Appendix C.

Stormwater Management Program Team

SWMP Team Coordinator

Name	Jesse Riedle	Title	DPW Director
Department	Public Works		
Phone Number	508-966-5813	Email	jriedle@bellinghamma.org
Responsibilities	Manages the Town of Bellingham's Stormwater Management Program and compliance with the MS4 Permit. Oversees DPW Stormwater Operations, including outfall screening, IDDE employee training, and the good housekeeping program.		

SWMP Team

Name	Sean Harrington	Title	Assistant DPW Director
Department	Public Works		
Phone Number	508-966-5813	Email	sharrington@bellinghamma.org
Responsibilities	Assists in managing DPW Stormwater Operations including keeping an inventory of SSOs; overseeing outfall screening and employee training; and managing the good housekeeping program.		

Name	David Ahnert	Title	GIS Coordinator/MS4 Compliance Mgr.
Department	Public Works		
Phone Number	508-966-5813	Email	dahnert@bellinghamma.org
Responsibilities	Manages the public education and outreach of Bellingham's stormwater program; provides opportunities for public involvement and participation; maintains a storm sewer system map; and coordinates with other Town departments on the development of construction and post-construction bylaws, policies and procedures.		

Name	Chris Seariac	Title	DPW Project Manager MS4 Coordinator
Department	Public Works		
Phone Number	508-966-5813	Email	csеariac@bellinghamma.org
	Assists in managing DPW Stormwater Operations including keeping an inventory of SSOs;		

Receiving Waters

The following table lists all receiving waters, impairments and number of outfalls discharging to each waterbody segment.

OR

The information can be found in the following document or at the following web address:

Table of Receiving Water included in NOI and Attached in Appendix C.

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
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Eligibility: Endangered Species and Historic Properties

*Reminder: The proper consultations and updates to the SWMP must be conducted for construction projects related to your permit compliance where Construction General Permit (CGP) coverage, which requires its own endangered species and history preservation determination, is NOT being obtained.

Attachments:

- ☒ The results of Appendix C U.S. Fish and Wildlife Service endangered species screening determination
- ☒ The results of the Appendix D historic property screening investigations
- ☐ If applicable, any documents from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), or other Tribal representative to mitigate effects

These attachments are required within one year of the permit effective date and are:

- ☒ Attached to this document (document names listed below)

  Endangered Species Act Eligibility Certification attached in Appendix D and National Historic Preservation Act Certification attached in Appendix E.

- ☐ Publicly available at the website listed below

Under what criterion did permittee determine eligibility for ESA?

☐ Criterion A ☐ Criterion B ☒ Criterion C

Under what criterion did permittee determine eligibility for Historic Properties?

☒ Criterion A ☐ Criterion B ☐ Criterion C

Below add any additional measures for structural controls that you're required to do through consultation with U.S. Fish and Wildlife Service (if applicable):

Not applicable.

Below add any additional measures taken 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 applicable):

Not applicable.

MCM 1
Public Education and Outreach
Permit Part 2.3.2

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 the pollutants in stormwater are reduced.

Examples and Templates:
EPA's Stormwater Education Toolbox
MassDEP's Stormwater Outreach Materials

Other templates relevant to MCM 1 can be found here: https://www.epa.gov/npdes-permits/stormwater-tools-new-england#peo

BMP: Multi-media Public Education and Outreach

BMP Number (Optional) **1A**

Document Name and/or Web Address:

Description:

Education and outreach on stormwater management using multi-media methods including web and print materials. The Town shall consider the following topics when developing educational messages and focus on topics most relevant to the Town of Bellingham: effects of lawn care on water quality, benefits of on-site infiltration of stormwater, effects of automotive work and car washing on water quality and proper disposal of swimming pool water. The Town is required to include proper pet waste management and septic system maintenance in educational messages as part of the requirements of Appendix H of the permit for bacteria impairments.

Targeted Audience: Residents

Responsible Department/Parties: Planning Board

Measurable Goal(s):

Distribute a minimum of two (2) educational messages to residents spaced at least one year apart and supplement this message with an annual message on proper pet waste management. The Town may also wish to measure results in more specific ways, like the percent of residents reached or changes in behaviors impacting stormwater management.

Message Date(s): 2018 (PY1), 2020 (PY3)

BMP: Multi-media Public Education and Outreach

BMP Number (Optional) **1B**

Document Name and/or Web Address:

Description:

Education and outreach on stormwater management using multi-media methods including web and print materials. The Town shall consider the following topics when developing educational messages and focus on topics most relevant to the Town of Bellingham: proper lawn maintenance, benefits of on-site infiltration of stormwater, use of detergents in building maintenance, proper use and storage of salt or other de-icing and anti-icing materials, proper storage of materials, proper management of waste and dumpsters, proper management of parking lot surfaces, proper car care activities, and proper disposal of swimming pool water.

Targeted Audience: Businesses, institutions and commercial facilities

Responsible Department/Parties: Planning Board

Measurable Goal(s):

Distribute a minimum of two (2) educational messages to businesses, institutions and commercial facilities spaced at least one year apart. The Town may also wish to measure results in more specific ways, like the

percent of businesses, institutions and commercial facilities reached or changes in behaviors impacting stormwater management.

Message Date(s): 2019 (PY2), 2021 (PY4)

BMP: Multi-media Public Education and Outreach

BMP Number (Optional) **1C**

Document Name and/or Web Address:

Description:

Education and outreach on stormwater management using multi-media methods including web and print materials. The Town shall consider the following topics when developing educational messages and focus on topics most relevant to the Town of Bellingham: 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).

Targeted Audience: Developers (construction)

Responsible Department/Parties: Planning Board

Measurable Goal(s):

Distribute a minimum of two (2) educational messages to developers spaced at least one year apart. The Town may also wish to measure results in more specific ways, like the percent of developers reached or changes in behaviors impacting stormwater management.

Message Date(s): 2018 (PY1), 2020 (PY2)

BMP: Multi-media Public Education and Outreach

BMP Number (Optional) **1D**

Document Name and/or Web Address:

Description:

Education and outreach on stormwater management using multi-media methods including web and print materials. The Town shall consider the following topics when developing educational messages and focus on topics most relevant to the Town of Bellingham: equipment inspection and maintenance, proper storage of industrial materials, 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, benefits of on-site infiltration of stormwater runoff from areas with low exposure to industrial materials, proper maintenance of parking lot surfaces, and requirements for coverage under EPA's Multi-Sector General Permit.

Targeted Audience: Industrial facilities

Responsible Department/Parties: Planning Board

Measurable Goal(s):

Distribute a minimum of two (2) educational messages to industrial facilities spaced at least one year apart. The Town may also wish to measure results in more specific ways, like the percent of industrial facilities reached or changes in behaviors impacting stormwater management.

Message Date(s): 2019 (PY2), 2021 (PY4)

MCM 2
Public Involvement and Participation
Permit Part 2.3.3

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

BMP: Public Review of Stormwater Management Program

BMP Number (Optional) **2A**

Location of Plan and/or Web Address: hptts://www.bellinghamma.org/department-public-works

Responsible Department/Parties: Public Works

Measurable Goal(s):

Annually provide the public with an opportunity to participate in the review and implementation of the SWMP.

BMP: Public Participation in Stormwater Management Program Development

BMP Number (Optional) **2B**

Description:

Provide opportunities for public involvement and participation in Bellingham's stormwater program. Specific activities may include, but are not limited to, the annual hazardous waste collection day (hosted by DPW), and annual cleanups along the Charles River.

Responsible Department/Parties: Public Works

Measurable Goal(s):

Ongoing compliance and reporting of events and activities organized for public participation in Annual Reports.

BMP: Public Participation

BMP Number (Optional) **2C**

Document Name and/or Web Address: N/A

Description:

Organize meetings of Interdepartmental Stormwater Working Group, consisting of representatives from departments including Planning and Zoning, Public Works, and Town Administrator's Office.

Responsible Department/Parties: Planning Board

Measurable Goal(s):

Meetings and communication between the Stormwater working group as needed.

MCM 3
Illicit Discharge Detection and Elimination (IDDE) Program

Permit Part 2.3.4

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

Examples and Templates:
IDDE Program Template and SOPs

Other templates relevant to IDDE can be found here: https://www.epa.gov/npdes-permits/stormwater-tools-new-england#idde

BMP: IDDE Legal Authority

BMP Number (Optional) **3A** **Completed** (by May 1, 2008) ☒

Ordinances Link or Reference: https://ecode360.com/15957903

Department Responsible for Enforcement: Board of Selectmen

BMP: Sanitary Sewer Overflow (SSO) Inventory

BMP Number (Optional) **3B** **Completed** (by year 1) ☒

Document Name and/or Web Address: SSO Inventory included in Appendix F

Description:

Annually track and report the following SSO information: the location; a clear statement of whether the discharge entered a surface water directly or entered the MS4; date(s) and time(s) of each known SSO occurrence; estimated volume(s) of the occurrence; description of the occurrence indicating known or suspected cause(s); mitigation and corrective measures completed with dates implemented; and mitigation and corrective measures planned with implementation schedules.

Responsible Department/Parties: Public Works

Measurable Goal(s):

Develop SSO inventory by June 30, 2019. Track number of SSOs identified and removed annually and update in Annual Reports.

SSO Reporting:

In the event of an overflow or bypass, a notification must be reported within 24 hours by phone to MassDEP, EPA, and other relevant parties. Follow up the verbal notification with a written report following MassDEP's Sanitary Sewer Overflow (SSO)/Bypass notification form within 5 calendar days of the time you become aware of the overflow, bypass, or backup.

The MassDEP contacts are:	The EPA contacts are:
Northeast Region (978) 694-3215 205B Lowell Street Wilmington, MA 01887 Central Region (508) 792-7650 8 New Bond Street Worcester, MA 01606 Southeast Region (508) 946-2750 20 Riverside Drive Lakeville, MA 02347 Western Region (413) 784-1100 436 Dwight Street Springfield, MA 01103 24-hour Emergency Line 1-888-304-1133	EPA New England (617) 918-1510 5 Post Office Square Boston, MA 02109

BMP: Map of Storm Sewer System

BMP Number (Optional) **3C**

Phase I Completed (by year 2) ☒

Phase II Completed (by year 10) ☐

Document Location and/or Web Address: https://www3.epa.gov/region1/npdes/stormwater/ma/tms4noi/bellingham.pdf

Description:

Create a map of the storm sewer system and update during IDDE program implementation.

Responsible Department/Parties: Public Works

Measurable Goal(s):

By June 30, 2020, complete Phase I: map 100% of outfalls and receiving waters, open channel conveyances, interconnections with other MS4s and other storm sewer systems, municipally-owned stormwater treatment structures, waterbodies identified by name and indication of all use impairments, and initial catchment delineations. By June 30, 2028, complete Phase II: map 100% of outfall spatial locations, pipes, manholes, catch basins, refined catchment delineations, and municipal sanitary sewer system.

BMP: IDDE Program

BMP Number (Optional) **3D/3E1-3**

Written Document Completed (by year 1) ☒

Document Name and/or Web Address: Illicit Discharge Detection and Elimination Program

Description:

Create written IDDE program. Complete outfall/interconnection inventory and initial ranking, dry weather outfall screening and sampling, and catchment investigations.

Responsible Department/Parties: Public Works

Measurable Goal(s):

By June 30, 2019, develop written IDDE program and complete outfall/interconnection and initial ranking. Update IDDE program, inventory and ranking as necessary. By June 30, 2021, conduct 100% of outfall screening on High and Low Priority Outfalls. By June 30, 2025, complete catchment investigations for 100% of the Problem Outfalls. By June 30, 2028, complete 100% of all catchment investigations. Track number of illicit discharges identified and volume removed. This BMP will be coordinated with requirements for TMDLs and Water Quality Limited Waters.

The outfall/interconnection inventory and initial ranking and the dry weather outfall and interconnection screening and sampling results can be found:

At the Department of Public Works

BMP: Employee Training

BMP Number (Optional) **3F**

Description:

Train employees on IDDE implementation.

Responsible Department/Parties: Public Works

Measurable Goal(s):

Training occurs annually. Track employees trained, training topics, date/time, and materials presented.

MCM 4
Construction Site Stormwater Runoff Control
Permit Part 2.3.5

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

Examples and Templates:
Examples and templates relevant to MCM 4, including model ordinances and site inspection templates, can be found here: https://www.epa.gov/npdes-permits/stormwater-tools-new-england#csrc

BMP: Sediment and Erosion Control Ordinance

BMP Number (Optional) **4A** **Completed** (by May 1, 2008) ☒

Ordinances Link or Reference: https://www.bellinghamma.org/sites/bellinghamma/files/uploads/procedural_rules_for_the_planning_board.pdf

Department Responsible for Enforcement: Planning Board

BMP: Site Plan Review Procedures

BMP Number (Optional) **4B** **Written procedures completed** (by year 1) ☒

Document Name and/or Web Address:

Description:

Develop and implement written procedures for site plan review per Part 2.3.5 of the General Permit.

Responsible Department/Parties: Planning Board

Measurable Goal(s):

Review current procedures and modify if necessary by June 30, 2019.

BMP: Site Inspections and Enforcement of Sediment and Erosion Control Measures Procedures

BMP Number (Optional) **4B** **Completed** (by year 1) ☒

Document Name and/or Web Address:

Description:

Develop and implement written procedures for site inspections and enforcement procedures per Part 2.3.5 of the General Permit.

Responsible Department/Parties: Planning Board

Measurable Goal(s):

Review current procedures and modify if necessary by June 30, 2019.

MCM 5
Post Construction Stormwater Management in New Development and Redevelopment

Permit Part 2.3.6

Objective: The objective of an effective post construction stormwater management program is to reduce the discharge of pollutants found in stormwater to the MS4 through the retention or treatment of stormwater after construction on new or redeveloped sites and to ensure proper maintenance of installed stormwater controls.

Examples and Templates:
Examples and templates relevant to MCM 5, including model ordinances and bylaw review templates and guidance can be found here: https://www.epa.gov/npdes-permits/stormwater-tools-new-england#pcsm

BMP: Post-Construction Ordinance

BMP Number (Optional) **5A** **Completed** (by year 2) ☐

Town Ordinances Link or Reference: https://www.bellinghamma.org/sites/bellinghamma/files/uploads/procedural_rules_for_the_planning_board.pdf

Department Responsible for Enforcement: Planning Board

BMP: Street Design and Parking Lot Guidelines Report

BMP Number (Optional) **5B** **Completed** (by year 4) ☒

Document Name and/or Web Address:

Description:

By June 30, 2022, develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if change to design standards for streets and parking lots can be modified to support low impact design options.

Responsible Department/Parties: Planning Board

Measurable Goal(s):

Complete report no later than four (4) years of permit effective date.

BMP: Green Infrastructure Report

BMP Number (Optional) **5C** **Completed** (by year 4) ☒

Document Name and/or Web Address:

Description:

By June 30, 2022, develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist.

Responsible Department/Parties: Planning Board

Measurable Goal(s):

Complete report no later than four (4) years of permit effective date.

BMP: List of Municipal Retrofit Opportunities

BMP Number (Optional) **5D** **Completed** (by year 4) ☒

Document Name and/or Web Address:

Description:

By June 30, 2022, conduct detailed inventory of Town-owned properties and rank for retrofit potential. At a minimum, the Town shall consider municipal properties with significant impervious cover that could be modified or retrofitted to reduce the frequency, volume or pollutant loads of stormwater discharges.

Responsible Department/Parties: Public Works

Measurable Goal(s):

Complete report no later than four (4) years of permit effective date, beginning in year 5 keep a running list of at least five (5) retrofit sites.

MCM 6
Good Housekeeping and Pollution Prevention for Permittee Owned Operations

Permit Part 2.3.7

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.

Examples and Templates:
Examples and templates relevant to MCM 6, including SOP templates for catch basin cleaning, street sweeping, vehicle maintenance, parks and open space management, winter deicing, and Stormwater Pollutoin Prevention Plans can be found here: https://www.epa.gov/npdes-permits/stormwater-tools-new-england#gh

PERMITTEE OWNED FACILITIES

BMP: Parks and Open Spaces Operations and Maintenance Procedures

BMP Number (Optional) **6A** **Written Document Completed** (by year 2) ☒

Document Name and/or Web Address:

Description:

By June 30, 2020, inventory and create O&M procedures for all permittee-owned parks and open spaces.

Responsible Department/Parties: Public Works

Measurable Goal(s):

Complete two (2) years after permit effective date, implement in following years.

Properties List (Optional)**:**

BMP: Buildings and Facilities Operations and Maintenance Procedures

BMP Number (Optional) **6A** **Written Document Completed** (by year 2) ☒

Document Name and/or Web Address:

Description:

By June 30, 2020, inventory and create O&M procedures for all permittee-owned buildings and facilities (including their storm drains).

Responsible Department/Parties: Public Works

Measurable Goal(s):

Complete two (2) years after permit effective date, implement in following years.

Properties List (Optional)**:**

BMP: Vehicles and Equipment Operations and Maintenance Procedures

BMP Number (Optional) **6A** **Written Document Completed** (by year 2) ☒

Document Name and/or Web Address:

Description:

By June 30, 2020, inventory and create O&M procedures for all permittee-owned vehicles and equipment.

Responsible Department/Parties: Public Works

Measurable Goal(s):

Complete two (2) years after permit effective date, implement in following years.

Properties List (Optional)**:**

INFRASTRUCTURE

BMP: Infrastructure Operations and Maintenance Procedures

BMP Number (Optional) **6B** **Written Procedure Completed** (by year 2) ☒

Document Name and/or Web Address:

Description:

By June 30, 2020, establish and implement a program for repair and rehabilitation of MS4 infrastructure.

Responsible Department/Parties: Public Works

Measurable Goal(s):

Complete two (2) years after permit effective date, implement in following years.

BMP: Catch Basin Cleaning Program

BMP Number (Optional) **6D-1** **Written Procedure Completed** (by year 1) ☒

Document Name and/or Web Address:

Description:

By June 30, 2019, begin to improve procedures to optimize catch basin cleaning developed under BMP 6B.

Formalize procedures in Town-wide Operations and Maintenance Plan described in BMP 6A by June 30, 2020. This BMP will be coordinated with requirements for TMDLs and Water Quality Limited Waters.

Responsible Department/Parties: Public Works

Measurable Goal(s):

Track frequency and material quantity of catch basin cleaning. Document plan for optimizing catch basin cleaning in the first Annual Report.

BMP: Street Sweeping Program

BMP Number (Optional) **6D-2** **Written Procedure Completed** (by year 1) ☒

Document Name and/or Web Address:

Description:

By June 30, 2019, implement procedures for street and parking lot sweeping developed under BMP 6B. Per the metals impairment for the Peters River, the frequent of street sweeping must be increased for target areas with potential for high pollutant loads.

Responsible Department/Parties: Public Works

Measurable Goal(s):

Annually track number of miles cleaned or the volume or mass of material removed.

BMP: Winter Road Maintenance Program

BMP Number (Optional) **6D-3** **Written Procedure Completed** (by year 1) ☒

Document Name and/or Web Address:

Description:

By June 30, 2019, implement procedures for use and storage of deicing materials developed under BMP 6B.

Responsible Department/Parties: Public Works

Measurable Goal(s):

Evaluate at least one salt/chloride alternative for use in the municipality. Implement program for winter road maintenance throughout permit term.

BMP: Stormwater Treatment Structures Inspection and Maintenance Procedures

BMP Number (Optional) **6D-4** **Completed** (by year 1) ☒

Document Name and/or Web Address:

Description:

Inspect stormwater treatment structures annually by June 30, beginning in Year 1. By June 30, 2020, implement procedures to inspect and maintain Town-owned structural stormwater BMPs.

Responsible Department/Parties: Public Works

Measurable Goal(s):

Develop an inventory of Town-owned BMPs within two years of permit effective date. Annually report on inspection and maintenance conducted.

BMP: SWPPP

BMP Number (Optional) **6C** **Completed** (by year 2) ☒

Document Name and/or Web Address: Department of Public Works Facility SWPPP
Recycling Center Facility SWPPP

Description:

By June 30, 2020, develop and implement a SWPPP and SWPPP BMPs at maintenance garages, transfer stations and other waste-handling facilities.

Responsible Department/Parties: Public Works

Measurable Goal(s):

Update or develop SWPPPs within two years of permit effective date, implement in following years.

Annual Evaluation

Year 1 Annual Report

Document Name and/or Web Address:

https://www3.epa.gov/region1/npdes/stormwater/ma/reports/2019/bellingham-ma-ar19.pdf

Year 2 Annual Report

Document Name and/or Web Address:

https://www3.epa.gov/region1/npdes/stormwater/ma/reports/2020/bellingham-ma-ar20.pdf

Year 3 Annual Report

Document Name and/or Web Address:

https://www3.epa.gov/region1/npdes/stormwater/ma/reports/2021/BELLINGHAM_MA_AR21.pdf

Year 4 Annual Report

Document Name and/or Web Address:

Insert link to EPA website or include copy in Appendix I when complete.

Year 5 Annual Report

Document Name and/or Web Address:

Insert link to EPA website or include copy in Appendix I when complete.

Year 6 Annual Report

Document Name and/or Web Address:

Insert link to EPA website or include copy in Appendix I when complete.

Add a Year

TMDLs and Water Quality Limited Waters

Select the applicable Impairment(s) and/or TMDL(s).

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus

☐ Solids/oil/grease (hydrocarbons)/metals

TMDL(s)

In State:

☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen

☒ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State:

☐ Bacteria and Pathogen ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Bacteria/Pathogens

Combination of Impaired Waters Requirements and TMDL Requirements as Applicable

Applicable Receiving Waterbody(ies)	TMDL Name (if applicable)	Add/Delete Row
Charles River MA72-04	Total Maximum Daily Loads for Pathogens within the Charles River Watershed	+ -
Peters River MA51-18		+ -
Beaver Brook MA72-12		+ -
Arnolds Brook MA51-32		+ -
Hopping Brook MA72-35		+ -

Annual Requirements Beginning Year 1

Rank outfalls to these receiving waters as high priority for IDDE implementation in the initial outfall ranking

The relevant BMP number(s) listed above in the Stormwater Management Program OR the description of implementation actions and document location(s) are:

The Town of Bellingham must implement the IDDE program described in BMPs 3A-3F. Additionally, catchments draining to any of the waterbodies listed above, which are impaired for bacteria or pathogens, shall be designated as either Problem Catchments or High Priority in implementation of the IDDE program and in the initial outfall ranking.

Public Education and Outreach

(Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information))

Annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate

The relevant BMP number(s) listed above in the Stormwater Management Program OR the description of implementation actions and document location(s) are:

Bellingham must supplement the residential public education program described in BMP 1A with an annual message about the proper management of pet waste, including noting existing bylaws where appropriate.

Permittee or its agents disseminate educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time

The relevant BMP number(s) listed above in the Stormwater Management Program OR the description of implementation actions and document location(s) are:

Bellingham must supplement the residential public education program described in BMP 1A by disseminating educational material to dog owners at the time of issuance or renewal of dog licenses. This is an ongoing requirement.

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

The relevant BMP number(s) listed above in the Stormwater Management Program OR the description of implementation actions and document location(s) are:

Bellingham must supplement the residential public education program described in BMP 1A by providing information to owners of septic systems about proper maintenance in any catchment that discharges to a waterbody impaired for bacteria or pathogens (i.e., Charles River, Peters River, Beaver Brook, and Arnolds Brook).

Charles River Watershed Phosphorus TMDL

PCP Phase	Document Location
I (completed by year 5)	Bellingham DPW, 26 Blackstone Street, Bellingham, MA https://www.bellinghamma.org/stormwater
II (completed by year 10)	
III (completed by year 15)	

Appendix A

Delegation of Authority

Town of Bellingham
BOARD OF SELECTMEN
10 Mechanic Street
Bellingham, Massachusetts 02019
Tel: 508-966-5800 * Fax: 508-966-4425

July 8, 2019

Ms. Thelma Murphy
U.S. Environmental Protection Agency
5 Post Office Square, Suite 100 (OEP06-1)
Boston, MA 02109-3912

Re: NPDES MA Small MS4 General Permit
Delegating an "Authorized Representative"

Dear Ms. Murphy:

This letter serves to designate the Town of Bellingham's DPW Director as an authorized person for signing the Stormwater Management Plan (SWMP), stormwater pollution prevention plans (SWPPPs), inspection reports, annual reports, monitoring reports, reports on training and other information required under the General Permit. This authorization cannot be used for signing a NPDES permit application (e.g., Notice of Intent (NOI)) in accordance with 40 CFR 122.22.

By signing this authorization, I confirm that the Chair of the Board of Selectmen meets the following requirements to make such a designation as set forth in Appendix B, Subparagraph 11 of the Small MS4 General Permit:

> *For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).*

"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."

Sincerely,

Daniel Spencer
Chair of Board of Selectmen

Appendix B

Town Specific MS4 Background

Bellingham is located in Norfolk County, approximately 25 miles southeast of Worcester. There are approximately 0.5 square miles of water within its 19.0 square mile footprint. According to the 2010 United States Census, Bellingham is home to approximately 16,330 residents in more than 6,150 households. Almost all of the Town is within the urbanized area and therefore, regulated by EPA under the MS4 program.

Figure 1 Location of Bellingham, Massachusetts

The Town of Bellingham is located within the Charles River Watershed and the Blackstone River Watershed. Protecting the quality of Bellingham's water resources, including lakes, ponds, rivers and groundwater supplies, is a priority for the Town of Bellingham. Pollutants from stormwater runoff are a contributing factor to the impairment of Bellingham's waterbodies, including bacterial contamination and high phosphorus levels.

The Town of Bellingham has achieved all of the measurable goals for the BMPs selected in the 2003 Notice of Intent and those added in subsequent years to reflect unplanned stormwater activities by the Town. A list of BMPs completed under the 2003 Small MS4 Permit is included on the next page.

The Town of Bellingham has taken advantage of low-cost and innovate approaches to provide stormwater education and outreach, primarily to residential audiences and developers. The Town maintains a Stormwater Information webpage, which includes education for households and small businesses. The Town also displays educational posters on stormwater topics at the Town Hall including pet waste management, fertilizer use and low impact development. The Town provides opportunities for public participation through hazardous waste collection day and annual cleanups along the Charles River.

The Town has made significant progress in mapping the stormwater system and developing a GIS base map of catch basins, drainage manholes, 286 known Town-owned outfalls and known connectivity. The Town approved the Illicit Connections and Discharges Bylaw in 2006 and requires that all new catch basins have hoods installed over the outlet pipe and new drain manholes have a one-foot sump below the lowest outlet pipe, as part of the Subdivision Regulations.

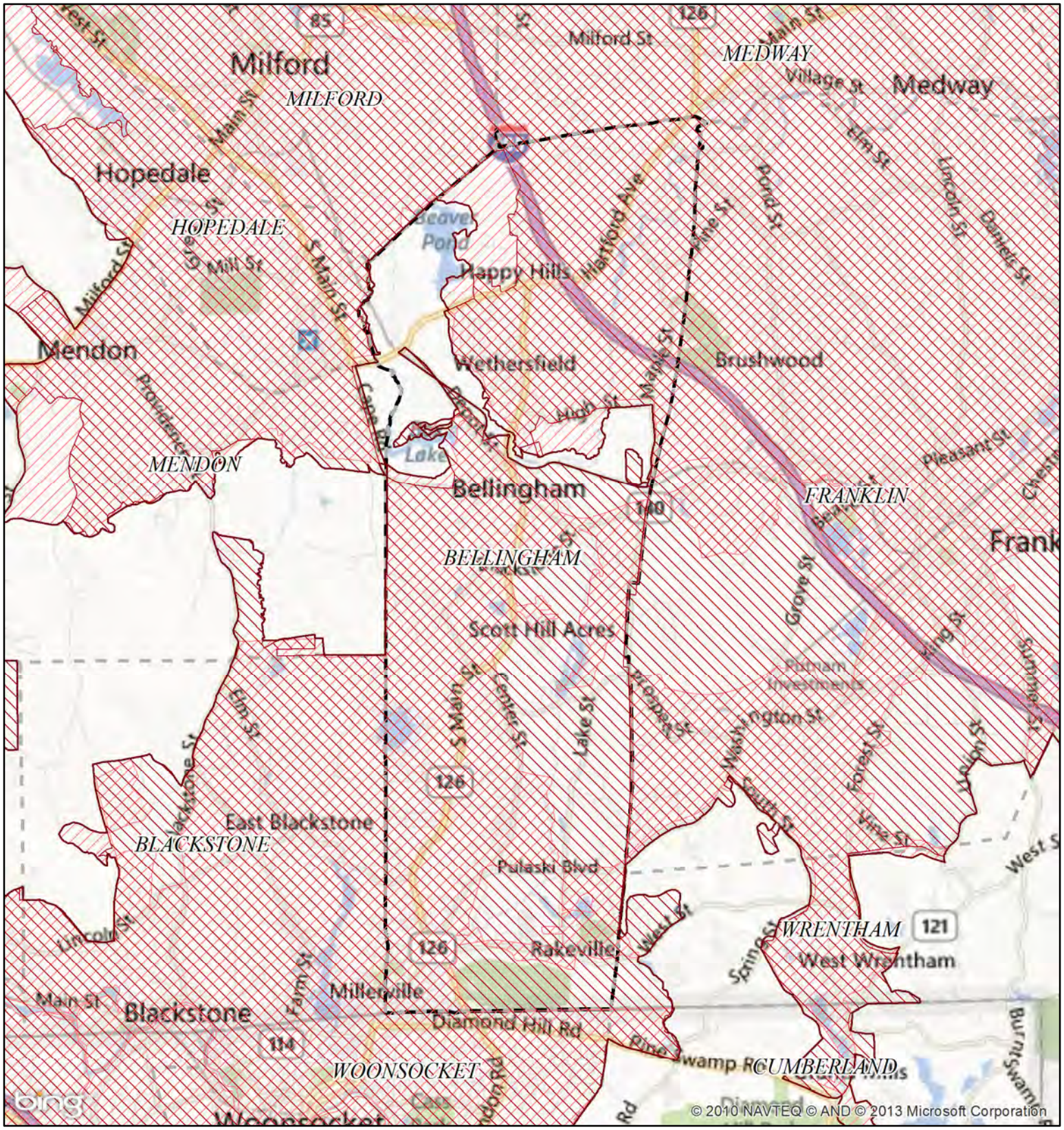
In 2007, the Town revised their Regulations and Procedural Rules to include Erosion and Sedimentation Control requirements both during and post construction.

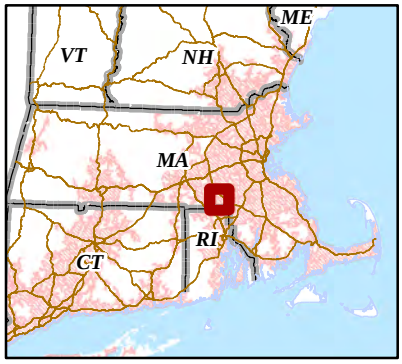
Lastly, the Town has established an active Good Housekeeping Program for stormwater pollution prevention including active street sweeping, catch basin cleaning, maintaining a SWPPP and SPCC Plan for their DPW garage.

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):

1.01: Youth Summer Water Awareness Program – now under BMP 1A
1.02: Distribute Written Information – now under BMPs 1A-D
1.03: Smart Storm Roof Runoff Recharge/Reuse Info Posting – now under BMP 1A-1D
2.01: Create Storm Water Management Committee – now under BMP 2C
2.02: Open and Advertise SWMC Meetings – now under BMPs 2B-2C
3.01: Complete GIS Mapping of 2000 Urbanized Area – now under BMP 3C
3.02: Distribute Written Info to Residents on Illicit Discharge – now under BMP 1A
3.03: Illicit Discharge Bylaw to Town Meeting – now under BMPs 3A
3.04: Train DPW Staff to Identify Illicit Discharges – now under BMP 3F
4.01: Review Existing Bylaws – now under BMP 4A
4.02: Suggest Modifications to Bylaws & Regulations – now under BMP 4A
4.03: Procedures for Town's Site Inspectors – now under BMP 4B
5.01: Review existing bylaws – now under BMP 5A
5.02: Suggest Modification to Bylaws & Regulations – now under BMP 5A
5.03: Annual Review of Post Construction Runoff Procedures – now under BMP 5A
6.01: Continuous Street Sweeping & CB Cleaning – now under BMP 6D-2
6.02: Sweeping & CB Cleaning Records – now under BMP 6D-1
6.03: DPW & Parks Department Facilities Master Plan – now under BMP 6A
6.04: All Town Facilities Stormwater Review and Master Plan – now under BMP 6A
6.05: Construct Recharge & Treatment at Plymouth Road – now covered under MCM 5





NPDES Phase II Stormwater Program
Automatically Designated MS4 Areas
Bellingham MA

Regulated Area:

UA Based on 2000 Census | UA Based on 2010 Census

0 1 2 3 4 5 Kilometers

0 1 2 3 4 Miles

Town Population: 16333

Regulated Population: 16143

(Populations estimated from 2010 Census)

EPA

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

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

Appendix C

Notice of Intent, System 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: Town of Bellingham | State: MA

EPA NPDES Permit Number (if applicable): MAR041091

Primary MS4 Program Manager Contact Information

Name: Donald DiMartino | Title: DPW Director

Street Address Line 1: 26 Blackstone Street

Street Address Line 2:

City: Bellingham | State: MA | Zip Code: 02019

Email: DDiMartino@bellinghamma.org | Phone Number: (508) 966-5813

Fax Number: (508) 966-5814

Other Information

Stormwater Management Program (SWMP) Location (web address or physical location, if already completed): https://www.bellinghamma.org/department-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.bellinghamma.org/sites/bellinghamma/files/uploads/noi_drainage_infrastructure_map.pdf

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): 10/11/06

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): 10/01/07

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): 10/01/07

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
Direct Discharge to Arnolds Brook MA51-32	6	☐	☐	☐	☐	☐	☐	☐	☒	☐	
Direct Discharge to Beaver Brook MA72-12	4	☐	☐	☐	☐	☐	☐	☐	☒	☐	
Tributary/Wetland to Beaver Brook MA72-12	12	☐	☐	☐	☐	☐	☐	☐	☒	☐	
Direct Discharge to Beaver Pond MA72004	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	Mercury in Fish Tissue
Direct Discharge to Bungay Brook	5	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Direct Discharge to Charles River MA72-04	16	☐	☐	☐	☐	☐	☐	☐	☐	☐	Other flow regime alterations, Chlordane, DDT, Fish Bioassessments, Mercury in Fish Tissue
Tributary/Wetland to Charles River MA72-04	5	☐	☐	☐	☐	☐	☐	☐	☐	☐	Other flow regime alterations, Chlordane, DDT, Fish Bioassessments, Mercury in Fish Tissue
Tributary/Wetland to Charles River MA72-03	6	☐	☐	☐	☐	☐	☐	☐	☐	☐	DDT
Tributary/Wetland to Crystal Lake	3	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Direct Discharge to Lake Hiawatha MA51062	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Tributary/Wetland to Lake Hiawatha MA51062	3	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Direct Discharge to Hopping Brook MA72-35	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Direct Discharge to Jenks Reservoir MA51075	3	☐	☐	☐	☐	☐	☐	☐	☐	☐	Non-native aquatic plants
Direct Discharge to Peters River MA51-18	17	☐	☐	☐	☐	☐	☐	☐	☒	☐	Copper, Lead
Tributary/Wetland to Peters River MA51-18	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Direct Discharge to Stall Brook	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Tributary/Wetland to Mine Brook MA72-14	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	Habitat assessment, Water temperature
Wetland to Lakeview Pond	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
Unnamed Pond off of Pony Court	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Bellstone Drive	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Denault Drive	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Easy Street	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Lake Street	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Linwood Ave	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Mann Street	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Maple Street	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of South Main Street	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Isolated Wetland off of Westminster Street	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Outside Receiving Water Discharge	162	☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	☐	☐	
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		☐	☐	☐	☐	☐	☐	☐	☐	☐	
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		☐	☐	☐	☐	☐	☐	☐	☐	☐	

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 and distribution of print materials)	Education and outreach on stormwater management topics of significance, (including proper pet waste management, effects of lawn care on water quality). Educational topics will include but are not limited to those in Part 2.3.2.d.i	Residents	Planning Board	Distribute a minimum of two (2) educational messages spaced at least a year apart	2018 (PY1)

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

BMP ID	BMP Media/Category	BMP Description	Targeted Audience	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
1B	Multi-media methods (including web and distribution of print materials)	Education and outreach on stormwater management topics of significance (including effects of lawn care on water quality, illicit discharges to the MS4). Educational topics will include but are not limited to those in Part 2.3.2.d.ii	Businesses, Institutions, and Commercial Facilities	Planning Board	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 attachment)	Education and outreach on stormwater management topics of significance (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)	Planning Board	Distribute a minimum of two (2) educational messages spaced at least a year apart	2018 (PY1)
1D	Multi-media methods (including web and distribution of print materials)	Education and outreach on stormwater management topics of significance (including general pollution prevention, illicit discharges to the MS4). Educational topics will include but are not limited to those in Part 2.3.2.d.iv	Industrial Facilities	Planning Board	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	Public Works	Annually provide the public with an opportunity to participate in the review and implementation of the SWMP	2018 (PY1)
2B	Public Participation	Provide opportunities for public involvement and participation in Bellingham's stormwater program (including supporting clean-up events and hosting a hazardous waste collection day). Specific activities, schedule, and lead departments are included in the SWMP.	Public Works	Ongoing compliance	2018 (PY1)
2C	Public Participation	Inter-departmental Stormwater Working Group	Planning Board	Stormwater working group will meet and communicate via email as needed	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/Bylaw	Complete. Continue to enforce and update if necessary.	Public Works	Track illicit discharges identified and removed. Track permits issues with certification of no illicit connections.	2018 (PY1)
3B	SSO Inventory	Develop SSO inventory in accordance of permit conditions	Public Works	Complete within 1 year of effective date of permit. Track # of SSOs identified and removed annually	2018 (PY1)
3C	Storm sewer system map	Create map and update during IDDE program implementation	Public Works	Update map within 2 years of effective date of permit and complete full system map 10 years after effective date of permit	2018 (PY1)
3D	Written IDDE program	Create written IDDE program	Public Works	Complete within 1 year of the effective date of permit and update as required	2018 (PY1)
3E	Assessment and Priority Ranking of Outfalls & Interconnections	1. Outfall/Interconnection Inventory and Initial Ranking as part of BMP 3D	Public Works	Complete within 1 year of the effective date of permit and update as necessary	2018 (PY1)
3E	Assessment and Priority Ranking of Outfalls & Interconnections	2. Dry Weather Outfall Screening & Sampling in accordance with IDDE Plan and permit conditions	Public Works	Complete 3 years after effective date of permit. Track # of illicit discharges identified & volume removed. Summarize screening/sampling results.	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
3E	Assessment and Priority Ranking of Outfalls & Interconnections	3. Catchment Investigations according to program and permit conditions	Public Works	Complete 10 years after effective date of permit. Track # and percentage of MS4 catchments evaluated. Track # of illicit discharges identified & volume removed. Summarize screening/sampling results.	2019 (PY2)
3F	Employee Training	Train employees on IDDE implementation	Public Works	Train annually. Track employees trained, training topic, date/time, and materials presented.	2018 (PY1)

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

Part III: Stormwater Management Program Summary

MCM 4: Construction Site Stormwater Runoff Control

BMP ID	BMP Category	BMP Description	Responsible Department/ Parties	Measurable Goal	Beginning Year of BMP Implementation
4A	Construction Bylaw and Regulations	Modify local bylaw and regulations, if necessary, to contain new MS4 provisions per Part 2.3.5.	Planning Board	Review current procedures and modify if necessary within 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 Part 2.3.5.	Planning Board	Review current procedures and modify if necessary within 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 Bylaw and Regulations	Modify local bylaw and regulations to contain new MS4 provisions per Part 2.3.6.a.	Planning Board	Modify existing bylaw and regulations within two (2) years of permit effective date	2019 (PY 2)
5B	Assess street and parking lot guidelines	Develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support low impact design options.	Planning Board	Complete report no later than (4) years of permit effective date	2020 (PY3)
5C	Assess allowing green infrastructure	Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist	Planning Board	Complete report no later than (4) years of permit effective date	2020 (PY3)
5D	Retrofit Feasibility Assessment	Conduct detailed inventory of Town-owned properties and rank for retrofit potential	Public Works	Complete report no later than 4 years of permit effective date, beginning in year 5 keep running list of at least 5 retrofit sites	2020 (PY3)

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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	Additional Description/Measurable Goal	Beginning Year of BMP Implementation
6A	Operation & Maintenance Program	Inventory and create O&M procedures for all permittee-owned parks and open spaces, buildings and facilities (including their storm drains), and vehicles and equipment	Public Works	Complete 2 years after permit effective date, implement in following years	2018 (PY1)
6B	Operation & Maintenance Program	Establish and implement program for repair and rehabilitation of MS4 infrastructure	Public Works	Complete 2 years after permit effective date, implement in following years	2019 (PY2)
6C	Stormwater Pollution Prevention Plans (SWPPP)	Develop and implement a SWPPP and SWPPP BMPs at maintenance garages, transfer stations and other waste-handling facilities	Public Works	Update or develop SWPPPs within 2 year of permit effective date, implement in following years	2019 (PY2)
6D	Operation & Maintenance Program	1. Implement procedures to optimize catch basin cleaning developed under BMP 6B	Public Works	Track frequency and material quantity of catch basin cleaning in town. In first Annual Report and in SWMP, document plan for optimizing catch basin cleaning.	2018 (PY1)
6D	Operation & Maintenance Program	2. Implement procedures for street and parking lot sweeping developed under BMP 6B	Public Works	Annually track number of miles cleaned or the volume or mass of material removed.	2018 (PY1)
6D	Operation & Maintenance Program	3. Implement procedures for use and storage of deicing materials developed under BMP 6B	Public Works	Implement program for winter road maintenance throughout permit term.	2018 (PY1)

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

BMP ID	BMP Category	BMP Description	Responsible Department / Parties	Additional Description/Measurable Goal	Beginning Year of BMP Implementation
6D	Operation & Maintenance Program	4. Implement procedures to inspect and maintain Town-owned structural stormwater BMPs	Public Works	Develop an inventory of Town-owned BMPs during PY3. Report on inspection and maintenance conducted annually starting in PY4.	2020 (PY3)

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)
Upper/Middle Charles River (Phosphorus)	Adhere to requirements in part A.I of Appendix F	Public Works
Lower Charles River (Phosphorus)	Adhere to requirements in part A.I of Appendix F	Public Works
Charles River Watershed (Bactria/Pathogen)	Adhere to requirements in part A.III of Appendix F	Public Works

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)
E. Coli	MA51-32 Arnolds Brook	Adhere to requirements in part III of Appendix H	Public Works
E. Coli	MA72-12 Beaver Brook	Adhere to requirements in part III of Appendix H	Public Works
E. Coli	MA51-18 Peters River	Adhere to requirements in part III of Appendix H	Public Works
Copper	MA51-18 Peters River	Adhere to requirements in part V of Appendix H	Public Works
Lead	MA51-18 Peters River	Adhere to requirements in part V of Appendix H	Public Works

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 Town of Bellingham meets Criterion C. The Town's stormwater discharges and discharge related activities will have no affect on listed species or critical habitat. The Town will consult with U.S. Fish and Wildlife as needed during the permit term.

3. The National Historic Preservation Act Eligibility Determination screening process has been completed and the Town of Bellingham meets Criterion A. The Town's stormwater discharges do not have the potential to cause effects on historic properties. The Town will consult with the State Historic Preservation Officer as needed during the permit term.

4. The 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 Town's Stormwater Management Plan.

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

Part V: Certification

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

Name:	Michael Soter	Title:	Board of Selectmen Chair
Signature:		Date:	9/19/2018

[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

MEDWAY

MILFORD

HOPEDALE

MENDON

FRANKLIN

BLACKSTONE

WRENTHAM

CHARLES

BLACKSTONE

Outfalls

Receiving Waterbody

- Direct Discharge Arnolds Brook MA51-32
- Direct Discharge Beaver Brook MA72-12
- Tributary/Wetland to Beaver Brook MA72-12
- Direct Discharge to Beaver Pond MA72004
- Direct Discharge Bungay Brook
- Direct Discharge Charles River MA72-04
- Tributary/Wetland to Charles River MA72-04
- Direct Discharge Charles River MA72-03
- Tributary/Wetland to Charles River MA72-03
- Wetland/Tributary to Crystal Lake
- Direct Discharge to Lake Hiawatha MA51062
- Tributary/Wetland to Lake Hiawatha MA51062
- Direct Discharge Hopping Brook MA72-35
- Isolated Wetland off of Denault Drive
- Isolated Wetland off of South Main Street
- Isolated Wetland off of Lake Street
- Isolated Wetland off of Easy Street
- Isolated Wetland off of Linwood Avenue
- Direct Discharge Jenks Reservoir MA51075
- Outside Receiving Water Discharge
- Direct Discharge Peters River MA51-18
- Tributary/Wetland to Peters River MA51-18
- Direct Discharge Stall Brook
- Tributary/Wetland to Mine Brook MA72-14
- Wetland to Lakeveiw Pond
- Unnamed Pond off of Pony Court

Legend

Roads

CLASS

- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road

National Wetlands Inventory Wetland Areas

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine
- NWI Rivers and Streams

Water Body Segments - Rivers (arcs)

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 (polygons)

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

- Urban Area 2000 Census
- Urban Area 2010 Census

Flood Zone Designations

- 100 Year Flood Zone
- Major Drainage Basin
- Subbasin
- Town Boundary
- Public Surface Water Supply
- Lake, Pond, River or Impoundment
- Inland Wetlands
- Coastal Wetlands
- Stream/Intermittent Stream

1:18,000

0 1,500 3,000

Feet

OUTFALLS AND RECEIVING WATERBODIES

Notice of Intent
Bellingham, Massachusetts

September 2018

Tighe&Bond
Engineers | Environmental Specialists

G:\GIS\MA\BellinghamMA\avproj\24x36_NOIRecWaters.mxd

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

VIA EMAIL

March 5, 2019

Michael Soter
Board of Selectmen Chair

And;

Donald DiMartino
DPW Director
26 Blackstone Street
Bellingham, MA. 02019
DDiMartino@bellinghamma.org

Re: National Pollutant Discharge Elimination System Permit ID #: MAR041091, Town of Bellingham

Dear Donald DiMartino:

The 2016 NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts (MS4 General Permit) is a jointly issued EPA-MassDEP permit. Your Notice of Intent (NOI) for coverage under this MS4 General Permit has been reviewed by EPA and appears to be complete. You are hereby granted authorization by EPA and MassDEP to discharge stormwater from your MS4 in accordance with the applicable terms and conditions of the MS4 General Permit, including all relevant and applicable Appendices. This authorization to discharge expires at midnight on **June 30, 2022.**

For those permittees that certified Endangered Species Act eligibility under Criterion C in their NOI, this authorization letter also serves as EPA's concurrence with your determination that your discharges will have no effect on the listed species present in your action area, based on the information provided in your NOI.

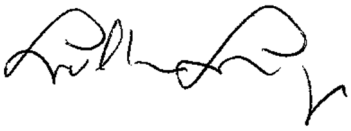
As a reminder, your first annual report is due by **September 30, 2019** for the reporting period from May 1, 2018 through June 30, 2019.

Information about the permit and available resources can be found on our website: https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit. Should you have any questions regarding this permit please contact Newton Tedder at tedder.newton@epa.gov or (617) 918-1038.

Sincerely,

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

and;



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

Appendix D

Endangered Species Act Eligibility Criteria Documentation

Endangered Species Act Eligibility Certification

TO: Town of Bellingham Stormwater Management Program Files

FROM: Tighe & Bond

COPY: Donald DiMartino, DPW Director

DATE: November 28, 2017

Tighe & Bond has completed the National Endangered Species Eligibility Determination screening process in accordance with Part 1.9.1 and Appendix C of U.S. EPA's National Pollutant Discharge Elimination System (NPDES) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) in Massachusetts (see Attachment A of this memorandum), effective July 1, 2018[1], and determined that the **Town of Bellingham** 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[2] and created an IPaC Trust Resources Report, included in Attachment B of 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 Bellingham.

Tighe & Bond then went to the USFWS New England Field Office website for Endangered Species Reviews/Consultations[3] and selected the Massachusetts state list[4] 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 of 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[5]. 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 Bellingham. Based on the results of the NHESP website review, Tighe & Bond determined there is no potential habitat for any listed species within the action area and therefore no further coordination is required with the USFWS. Attachment E provides

[1] Revised General Permit effective date according to June 29, 2017 EPA memorandum from EPA Region 1 Acting Regional Administrator.
[2] http://ecos.fws.gov/ipac/
[3] https://www.fws.gov/newengland/EndangeredSpec-Consultation_Project_Review.htm
[4] https://www.fws.gov/newengland/pdfs/MA%20species%20by%20town.pdf
[5] http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/species-information-and-conservation/rare-mammals/northern-long-eared-bat.html

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

Step 1 – Determine if you can meet USFWS Criterion A

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

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

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

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

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

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

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

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

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

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

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

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

3) Do you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the NOI that you will conduct an endangered species screening for the proposed site and contact the USFWS if you determine that the new activity "may

affect" or is "not likely to adversely affect" listed species or critical habitat under the jurisdiction of the USFWS."

Yes, during the course of the permit term the Town of Bellingham 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 of the questions under Step 3 resulted in "Yes" and thereby we determined the Town of Bellingham's action area meets the endangered species' eligibility requirements included in Criterion C.

J:\B\B0852 Bellingham MS4 Engineering\NPDES Compliance\ESA Eligibility\Endangered Species Act Eligibility Certification_Final.docx

Attachment A

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

APPENDIX C
ENDANGERED SPECIES GUIDANCE

A. Background

In order to meet its obligations under the Clean Water Act and the Endangered Species Act (ESA), and to promote the goals of those Acts, the Environmental Protection Agency (EPA) is seeking to ensure the activities regulated by this general permit do not adversely affect endangered and threatened species or critical habitat. Applicants applying for permit coverage must assess the impacts of their stormwater discharges and discharge-related activities on federally listed endangered and threatened species ("listed species") and designated critical habitat ("critical habitat") to ensure that those goals are met. Prior to obtaining general permit coverage, applicants must meet the ESA eligibility provisions of this permit by following the steps in this Appendix[1].

Applicants also have an independent ESA obligation to ensure that their activities do not result in any prohibited "take" of listed species[12]. The term "Take" is used in the ESA to include harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. "Harass" is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Many of the measures required in this general permit and in these instructions to protect species may also assist in ensuring that the applicant's activities do not result in a prohibited take of species in violation of section 9 of the ESA. If the applicant has plans or activities in an area where endangered and threatened species are located, they may wish to ensure that they are protected from potential take liability under ESA section 9 by obtaining an ESA section 10 permit or by requesting formal consultation under ESA section 7. Applicants that are unsure whether to pursue a section 10 permit or a section 7 consultation for takings protection should confer with the appropriate United States Fish and Wildlife Service (USFWS) office or the National Marine Fisheries Service (NMFS), (jointly the Services).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Step 1 – Determine if you can meet USFWS Criterion A

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

USFWS Effects Determination Guidance:

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

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

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

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

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

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

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

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

Step 4 - Document Results of the Eligibility Determination

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

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

C. Submittal of Notice of Intent

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

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

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

E. Services Information

United States Fish and Wildlife Service Office

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

U.S. FWS – Region 5
Supervisor

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

Natural Heritage Network

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

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

U.S. Fish and Wildlife IPaC system instructions

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

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

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

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

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

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

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

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

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

Attachment B

Bellingham IPaC Trust Resources Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 COMMERCIAL STREET, SUITE 300
CONCORD, NH 03301
PHONE: (603)223-2541 FAX: (603)223-0104
URL: www.fws.gov/newengland

Consultation Code: 05E1NE00-2017-SLI-1055 March 14, 2017
Event Code: 05E1NE00-2017-E-01953
Project Name: Bellingham NOI

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

United States Department of Interior
Fish and Wildlife Service

Project name: Bellingham NOI

Official Species List

Provided by:

New England Ecological Services Field Office
70 COMMERCIAL STREET, SUITE 300
CONCORD, NH 03301
(603) 223-2541
http://www.fws.gov/newengland

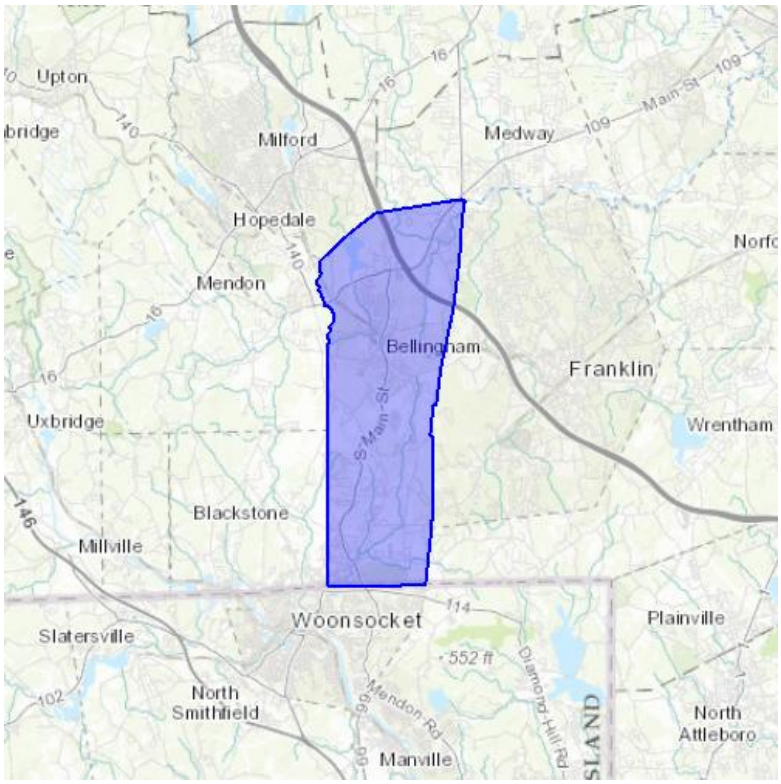
Consultation Code: 05E1NE00-2017-SLI-1055
Event Code: 05E1NE00-2017-E-01953

Project Type: Regulation Promulgation

Project Name: Bellingham NOI
Project Description: This project is applying for coverage under the 2016 MS4 General Permit. The project consists of the entire area of the Town of Bellingham's small municipal separate storm sewer systems (MS4) that falls within the urbanized area of the town. Based on EPA's 2016 MS4 General Permit Bellingham must apply for permit coverage for the Town's MS4 stormwater discharges and assess the impacts of the stormwater discharges and discharge-related activities on endangered and threatened species, and designated critical habitats that fall within the areas that fall within the MS4.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: The coordinates are too numerous to display here.

Project Counties: Norfolk, MA | Worcester, MA | Providence, RI

Endangered Species Act Species List

There are a total of 1 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Mammals	Status	Has Critical Habitat	Condition(s)
Northern long-eared Bat *(Myotis septentrionalis)* Population: Wherever found	Threatened		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Attachment C

Federally Listed Endangered and Threatened Species in Massachusetts

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

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

Updated 02/05/2016

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

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

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

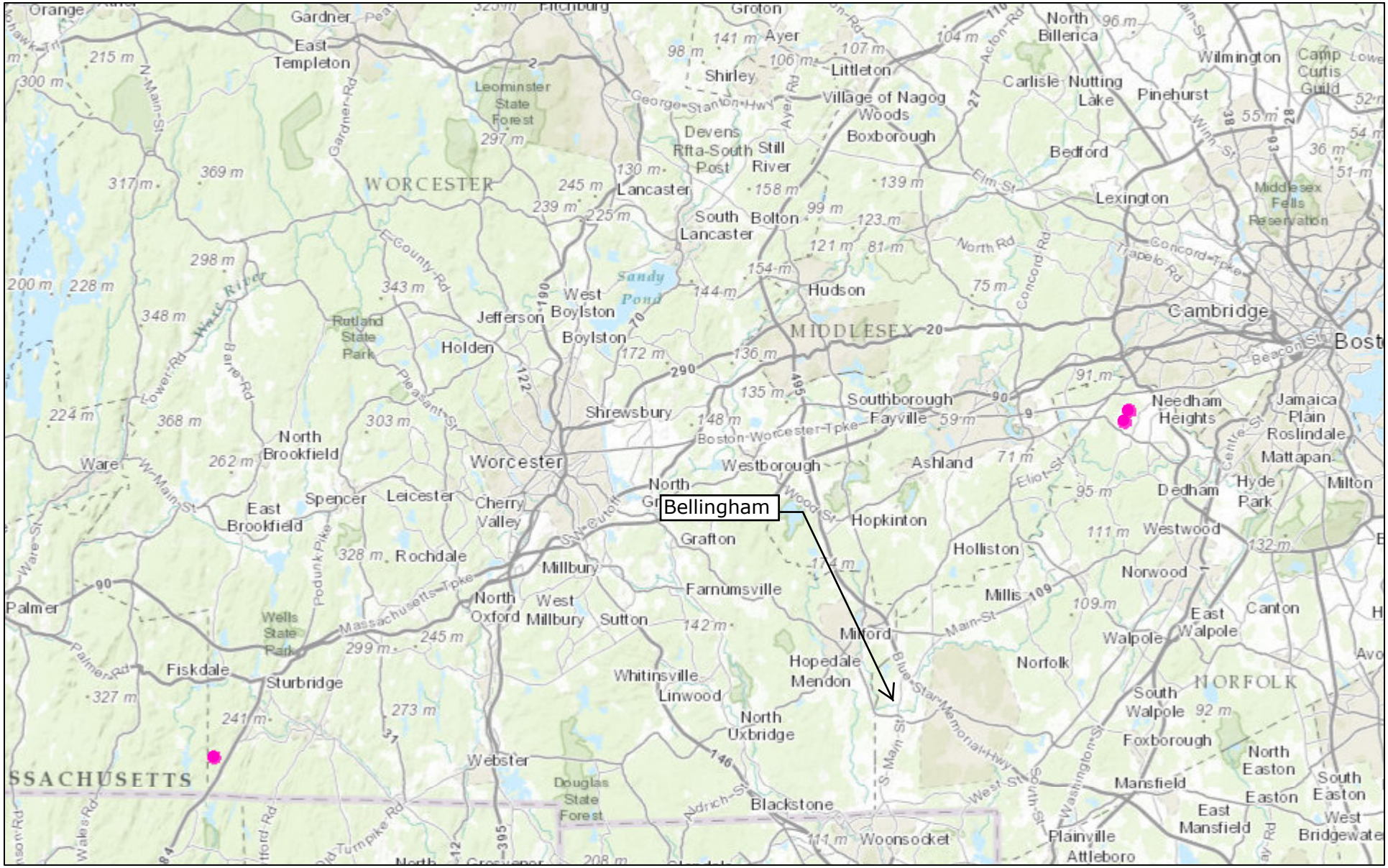
-Eastern cougar and gray wolf are considered extirpated in Massachusetts.
-Endangered gray wolves are not known to be present in Massachusetts, but dispersing individuals from source populations in Canada may occur statewide.
-Critical habitat for the Northern Red-bellied Cooter is present in Plymouth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

Updated 02/05/2016

Attachment D

Northern Long-eared Bat Location Map

NHESP No. Long-eared Bat Locations


Bellingham
WORCESTER
MIDDLESEX
NORFOLK
Worcester
Cambridge
Boston
Lancaster
Shrewsbury
Millbury
Grafton
Hopkinton
Milford
Holliston
Framingham
Natick
Needham
Dedham
Westwood
Norwood
Walpole
Foxborough
Mansfield
Attleboro
Woonsocket
Blackstone
Webster
Sturbridge
Palmer
Ware
Spencer
Leicester
Rochdale
Holden
Jefferson
West Boylston
Boylston
Hudson
Bolton
Harvard
Littleton
Ayer
Groton
Shirley
Devens
Lexington
Bedford
Boxborough
Concord
Acton
Carlisle
Billerica
Wilmington
Tewksbury
Chelmsford
Westford
Dunstable
Pepperell
Townsend
Fitchburg
Gardner
Templeton
Orange
Barre
Petersham
Hubbardston
Rutland
Paxton
Auburn
Southbridge
Oxford
Sutton
Uxbridge
Douglas
Whitinsville
Linwood
Hopedale
Mendon
Franklin
Wrentham
Norfolk
Plainville
Easton
Canton
Milton
Braintree
Weymouth
Hingham
Quincy
Brookline
Newton
Waltham
Watertown
Somerville
Medford
Malden
Revere
Winthrop
Chelsea
Everett
Arlington
Belmont
Wayland
Weston
Sudbury
Framingham
Natick
Wellesley
Dover
Medfield
Walpole
Norwood
Canton
Milton
Braintree
Weymouth
Hingham
Quincy
Brookline
Newton
Waltham
Watertown
Somerville
Medford
Malden
Revere
Winthrop
Chelsea
Everett
Arlington
Belmont
Wayland
Weston
Sudbury
Wellesley
Dover
Medfield
Leominster State Forest
Douglas State Forest
Wells State Park
Rutland State Park
Sandy Pond
Nutting Lake
Pinehurst
Camp Curtis Guild
Middlesex Fells Reservation
Jamaica Plain
Roslindale
Mattapan
Hyde Park
Needham Heights
Southborough
Fayville
Westborough
Ashland
North Billerica
Littleton
Village of Nagog Woods
Still River
Devens
Rfta-South Post
South Lancaster
North Brookfield
East Brookfield
West Brookfield
Cherry Valley
North Oxford
West Millbury
Farnumsville
Millis
East Walpole
South Walpole
North Easton
South Easton
East Mansfield
West Bridgewater
Plainville
Fiskdale
Whitinsville
North Uxbridge
Hopedale
Mendon
Norfolk
Foxborough
Mansfield
Easton
Plainville
Attleboro
Woonsocket
Blackstone
Webster

Attachment E

U.S. Fish and Wildlife Review Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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

January 20, 2017

To Whom It May Concern:

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

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

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

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

Sincerely yours,

Thomas R. Chapman
Supervisor
New England Field Office

Appendix E

Historic Properties Eligibility Criteria Documentation

National Historic Preservation Act Eligibility Certification

TO: Town of Bellingham Stormwater Management Program Files

FROM: Tighe & Bond

COPY: Donald DiMartino, DPW Director

DATE: July 10, 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[1], and determined that the **Town of Bellingham** 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 Bellingham is an existing facility authorized by the previous permit and therefore meets Criterion A (see Question 1 in Appendix D of the Permit) and is not, as part of developing and submitting the Notice of Intent for permit coverage, undertaking any activity involving subsurface land disturbance less than an acre. Based on this screening process, the Town of Bellingham'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 10, 2018. If the Town undertakes construction on or around a property that is listed or eligible for listing, the Town will coordinate with the State Historic Preservation Officer (SHPO) (i.e. the Massachusetts Historical Commission) by submitting a Project Notification Form and associated documentation for the project. As applicable for each project, the Town will implement measures to avoid or minimize adverse impacts on places listed, or eligible for listing, on the NRHP, including any conditions imposed by the SHPO or THPO. If the Town fails to document and implement such measures, those discharges are ineligible for coverage under EPA's Small MS4 General Permit.

J:\B\B0852 Bellingham MS4 Engineering\NPDES Compliance\HP\National Historic Preservation Act Eligibility Certification_Final.docx

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

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): Bellingham; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
BEL.A	North Bellingham Mill District		Bellingham	
BEL.B	Caryville - West Medway		Bellingham	
BEL.C	Caryville Mill Area		Bellingham	
BEL.D	North Bellingham Cemetery and Oak Hill Cemetery		Bellingham	
BEL.926	Adams - Ray Farmstead Site		Bellingham	
BEL.1	Bellingham Public Library	Common St	Bellingham	1930
BEL.3	Massey School - Center Elementary School	Common St	Bellingham	1873
BEL.81	Taft Woolen Company Worker Housing	2 Cutler St	Bellingham	c 1920
BEL.82	Taft Woolen Company Worker Housing	8 Cutler St	Bellingham	c 1920
BEL.83	Taft Woolen Company Worker Housing	10 Cutler St	Bellingham	c 1920
BEL.84	Taft Woolen Company Worker Housing	12 Cutler St	Bellingham	c 1920
BEL.85	Taft Woolen Company Worker Housing	14 Cutler St	Bellingham	c 1920
BEL.802	Scammell Cemetery	Depot St	Bellingham	c 1838
BEL.904	Depot Street Bridge over Charles River	Depot St	Bellingham	1829
BEL.10	Hixon House	237 Depot St	Bellingham	r 1850
BEL.11	Bellingham High School	60 Harpin St	Bellingham	c 1937
BEL.27	North School - Bellingham District #7 Schoolhouse	Hartford Ave	Bellingham	c 1855
BEL.800	Oak Hill Cemetery	Hartford Ave	Bellingham	1849
BEL.801	North Bellingham Cemetery	Hartford Ave	Bellingham	1712
BEL.907	North Bellingham Cemetery Perimeter Wall	Hartford Ave	Bellingham	r 1750
BEL.908	North Bellingham Cemetery Security Fence	Hartford Ave	Bellingham	r 1980
BEL.909	North Bellingham Cemetery Circulation System	Hartford Ave	Bellingham	c 1850
BEL.910	North Bellingham Cemetery Receiving Tombs	Hartford Ave	Bellingham	1804
BEL.911	North Bellingham Cemetery Flagpole	Hartford Ave	Bellingham	r 1980
BEL.912	North Bellingham Cemetery - Adams-Barber Monument	Hartford Ave	Bellingham	c 1807

Inv. No.	Property Name	Street	Town	Year
BEL.913	North Bellingham Cemetery - Smith Monument	Hartford Ave	Bellingham	r 1850
BEL.914	North Bellingham Cemetery - Bryant Obelisk	Hartford Ave	Bellingham	r 1850
BEL.915	North Bellingham Cemetery - Partridge, John Marker	Hartford Ave	Bellingham	1791
BEL.916	North Bellingham Cemetery - Coombes, Polly Marker	Hartford Ave	Bellingham	1795
BEL.917	North Bellingham Cemetery - Holbrook, Grace Marker	Hartford Ave	Bellingham	1791
BEL.918	North Bellingham Cemetery - Holbrook, J. Marker	Hartford Ave	Bellingham	1785
BEL.919	North Bellingham Cemetery - Holbrook, Luke Marker	Hartford Ave	Bellingham	1775
BEL.920	Oak Hill Cemetery - Penniman, Nathan Marker	Hartford Ave	Bellingham	1839
BEL.921	Oak Hill Cemetery - Slocomb Family Monument	Hartford Ave	Bellingham	r 1875
BEL.922	Oak Hill Cemetery - Benedict, Olive Marker	Hartford Ave	Bellingham	1869
BEL.923	Oak Hill Cemetery - Elmer Marker	Hartford Ave	Bellingham	r 1850
BEL.924	Oak Hill Cemetery - Hill, Asa Marker	Hartford Ave	Bellingham	1892
BEL.925	Oak Hill Cemetery - Stearns, Harold F. Marker	Hartford Ave	Bellingham	1960
BEL.12	Messenger, William House	23 Hartford Ave	Bellingham	c 1830
BEL.13	Rockwood, John House	24 Hartford Ave	Bellingham	c 1703
BEL.14	Holbrook, Lyman House	66 Hartford Ave	Bellingham	c 1830
BEL.4	Holbrook, John House	124 Hartford Ave	Bellingham	1765
BEL.15	Marsh, John - Thayer, Elias House	182 Hartford Ave	Bellingham	c 1780
BEL.47	Rays Woolen Company Worker Housing	319 Hartford Ave	Bellingham	c 1888
BEL.48	Rays Woolen Company Worker Housing	321 Hartford Ave	Bellingham	c 1888
BEL.49	Rays Woolen Company Worker Housing	323 Hartford Ave	Bellingham	c 1888
BEL.50	Rays Woolen Company Worker Housing	325 Hartford Ave	Bellingham	c 1888
BEL.51	Rays Woolen Company Worker Housing	331 Hartford Ave	Bellingham	c 1888
BEL.16	Bates and Arnold Cotton Mill Building	334 Hartford Ave	Bellingham	c 1835
BEL.17	North Baptist Church	365 Hartford Ave	Bellingham	c 1907
BEL.18	North Baptist Church Parsonage	365 Hartford Ave	Bellingham	c 1907
BEL.19	Saint Brendan's Roman Catholic Church	384 Hartford Ave	Bellingham	c 1895
BEL.5	Metcalf, Stephen House	430 Hartford Ave	Bellingham	c 1777
BEL.96		430 Hartford Ave	Bellingham	
BEL.20	Williams, P. A. House	436 Hartford Ave	Bellingham	c 1840
BEL.21	Nashon - Kean, P. House	454 Hartford Ave	Bellingham	c 1870
BEL.22	Fairbanks, E. House	457 Hartford Ave	Bellingham	c 1840
BEL.23	Fairbanks, Joseph House	462 Hartford Ave	Bellingham	c 1803
BEL.24	Rockwood, G. D. House	479 Hartford Ave	Bellingham	c 1875

Inv. No.	Property Name	Street	Town	Year
BEL.25	Metcalf, Hollis House	485 Hartford Ave	Bellingham	c 1825
BEL.26	Metcalf, F. House	491 Hartford Ave	Bellingham	c 1850
BEL.9		505 Hartford Ave	Bellingham	c 1900
BEL.99	Holbrook House	High St	Bellingham	r 1800
BEL.905	Meeting House - First Baptist Church Stone Marker	7 High St	Bellingham	1912
BEL.903	Maple Street Bridge over Penn Central Railroad	Maple St	Bellingham	c 1900
BEL.52	Rays Woolen Company Worker Housing	3 Maple St	Bellingham	c 1888
BEL.53	Rays Woolen Company Worker Housing	5 Maple St	Bellingham	c 1888
BEL.54	Rays Woolen Company Worker Housing	6-8 Maple St	Bellingham	c 1888
BEL.55	Rays Woolen Company Worker Housing	9 Maple St	Bellingham	c 1888
BEL.56	Rays Woolen Company Worker Housing	10 Maple St	Bellingham	c 1888
BEL.57	Rays Woolen Company Worker Housing	13 Maple St	Bellingham	c 1888
BEL.58	Charles River Woolen Company Worker Housing	15-17 Maple St	Bellingham	c 1910
BEL.59	Rays Woolen Company Worker Housing	18 Maple St	Bellingham	c 1888
BEL.60	Rays Woolen Company Worker Housing	21 Maple St	Bellingham	c 1888
BEL.61	Rays Woolen Company Worker Housing	22 Maple St	Bellingham	c 1888
BEL.62	Bellingham Woolen Company Worker Housing	26 Maple St	Bellingham	c 1920
BEL.63	Charles River Woolen Company Worker Housing	27 Maple St	Bellingham	c 1910
BEL.64	Bellingham Woolen Company Worker Housing	31 Maple St	Bellingham	c 1920
BEL.6	Rays Cotton Mill	32 Maple St	Bellingham	c 1826
BEL.65	Bellingham Woolen Company Worker Housing	33 Maple St	Bellingham	c 1920
BEL.7	Rays Woolen Company Mill #2	38 Maple St	Bellingham	c 1880
BEL.66	Bellingham Cotton Mill Worker Housing	46 Maple St	Bellingham	c 1840
BEL.67	Bellingham Cotton Mill Worker Housing	51 Maple St	Bellingham	c 1825
BEL.68	Bellingham Cotton Mill Worker Housing	52 Maple St	Bellingham	c 1840
BEL.69	Rays Woolen Company Worker Housing	55 Maple St	Bellingham	c 1890
BEL.70	Rays Woolen Company Worker Housing	56 Maple St	Bellingham	c 1890
BEL.71	Rays Woolen Company Worker Housing	58-60 Maple St	Bellingham	c 1890
BEL.72	Rays Woolen Company Worker Housing	59 Maple St	Bellingham	c 1890
BEL.73	Rays Woolen Company Worker Housing	63 Maple St	Bellingham	c 1890
BEL.74	Rays Woolen Company Worker Housing	67 Maple St	Bellingham	c 1890
BEL.75	Rays Woolen Company Worker Housing	70 Maple St	Bellingham	c 1900
BEL.76	Rays Woolen Company Worker Housing	71 Maple St	Bellingham	c 1890
BEL.28	Daniels House	74 Maple St	Bellingham	c 1825
BEL.29	Ames, W. House	79 Maple St	Bellingham	r 1840
BEL.97	Ames, W. Barn	79 Maple St	Bellingham	r 1840
BEL.2	Bellingham Town Hall	Mechanic St	Bellingham	1802

Inv. No.	Property Name	Street	Town	Year
BEL.901	Bellingham Soldier's Monument	Mechanic St	Bellingham	1874
BEL.902	Bellingham Watering Trough	Mechanic St	Bellingham	1904
BEL.30	Hitchcock, N. House	68 North Main St	Bellingham	c 1876
BEL.31	Tavern House Inn	71 North Main St	Bellingham	c 1780
BEL.32	Weatherby, Nathaniel House	72 North Main St	Bellingham	c 1702
BEL.906	Keystone Bridge	Old Pulaski Blvd	Bellingham	1835
BEL.33	Stowe, Elijah B. House and Store	10 Pearl St	Bellingham	c 1877
BEL.93	Stowe, Elijah B. Barn	10 Pearl St	Bellingham	c 1877
BEL.86		13 Pearl St	Bellingham	c 1860
BEL.94		13 Pearl St	Bellingham	
BEL.87	Fairbanks House	14 Pearl St	Bellingham	c 1890
BEL.95	Fairbanks Garage	14 Pearl St	Bellingham	
BEL.88	Taft Woolen Company Worker Housing	17 Pearl St	Bellingham	c 1920
BEL.89	Taft Woolen Company Worker Housing	19 Pearl St	Bellingham	c 1920
BEL.8	Ray - Taft - Cutler - McKean Woolen Mill	26 Pearl St	Bellingham	c 1865
BEL.90	Taft Woolen Company Worker Housing	28 Pearl St	Bellingham	c 1920
BEL.91	Taft Woolen Company Worker Housing	30 Pearl St	Bellingham	c 1920
BEL.92	Taft Woolen Company Worker Housing	32 Pearl St	Bellingham	c 1920
BEL.34	Chilson - Burr, Willie A. House	50 Railroad St	Bellingham	c 1840
BEL.77	Bellingham Woolen Company Worker Housing	5 Ray Ave	Bellingham	c 1920
BEL.78	Bellingham Woolen Company Worker Housing	9 Ray Ave	Bellingham	c 1920
BEL.79	Bellingham Woolen Company Worker Housing	11 Ray Ave	Bellingham	c 1920
BEL.80	Bellingham Woolen Company Worker Housing	13 Ray Ave	Bellingham	c 1920
BEL.35	Barber, A. J. Jr. House	5 Scott St	Bellingham	1840
BEL.98	Barber, A. J. Jr. Barn	5 Scott St	Bellingham	c 1840
BEL.36	Scott, Saul House	20 Scott St	Bellingham	c 1770
BEL.44	Bellingham First Baptist Church	South Main St	Bellingham	c 1826
BEL.37	Wilcox, F. House	501 South Main St	Bellingham	c 1780
BEL.38	Scott, Edgar House	510 South Main St	Bellingham	c 1925
BEL.39	Arnold, Jacob House	741 South Main St	Bellingham	c 1800
BEL.40	Cushman, Amariah House	950 South Main St	Bellingham	c 1800
BEL.41	Slocomb, Bethuel House	975 South Main St	Bellingham	c 1800
BEL.42	Scott, Daniel - Thayer, Gen. John M. House	1068 South Main St	Bellingham	c 1830
BEL.43	Rockwood, M. House	1198 South Main St	Bellingham	c 1840
BEL.45	Bellingham Fire Station #1 and Municipal Building	Wrentham Rd	Bellingham	1927
BEL.46	Wilcox, Jerald O. House	470 Wrentham Rd	Bellingham	c 1848

Appendix F

Sanitary Sewer Overflow Inventory

SSO Inventory for Bellingham, MA – Permit Year 6 Update

Summary table:

Date	Time	Location	Discharge to surface water or MS4	Estimated SSO Volume	Cause of SSO	Mitigation/Corrective Measures Completed
8/2/2018	8:00 PM	Wrentham Manor	No	2,000 Gallons	Pump/Lift Station Failure	See detailed descriptions below
6/3/2023	6:31 PM	77 Cross Street	No	600 Gallons	Pump/Lift Station Failure	
9/12/2023	9:52 AM	77 Cross Street	No	150 Gallons	Pump/Lift Station Failure	

Detailed descriptions:

- On **August 2nd, 2018** at approximately 8:00 PM, the Sewer Department was notified of sewage coming out of a manhole at Wrentham Manor (Wrentham Road). After responding and investigating, it was discovered that the pump/lift station failed and that the Mission Dialer failed to call out the alarms. The total volume of wastewater discharged to groundwater was approximately 2,000 gallons (no receiving water was impacted). Town staff repaired both pumps and investigated pump changes to eliminate clogging. The town is working with an electrician to get an alarm if power is lost due to mission dialer unit.

- **No SSOs in 2019, 2020, 2021, or 2022.**

- On **June 3rd, 2023** at approximately 6:31 PM, the Sewer Department noticed sewage coming out of a manhole near 77 Cross Street which connects to the sewer pump station. Crews arrived on site and started running the pump station manually which lowered the well and stopped the SSO by 7:30 PM. Crews had to monitor the station overnight until Veolia arrived on site to help vactor down the wet well. To continue to run the pump station without causing another SSO, Veolia was called on site to vactor the pump station wet well as needed to avoid another SSO. A contractor was hired to repair the station.

- On **September 12th, 2023** at approximately 9:52 AM, a DPW employee noticed sewage discharging out of a manhole near 77 Cross St, located in front of the sewer pump station. It was discovered that the control power for the station was turned off. The employee switched the breaker on, which initiated pumping and lowered the wet well, ultimately stopping the SSO. Pump 1 was out for repairs and once the station was fully operational, it was closely monitored. An outside contractor inspected the sewer station to ensure nothing was missed.

Appendix G

Plan Amendment Log

MS4 Record Keeping Update
Bellingham, MA
December 2024

Tighe&Bond

The Town's Stormwater Management Program has been appended through the Permit term, including development of the following standalone reports. These reports are available from the Bellingham Department of Public Works.

The **IDDE Program** has been updated to include:

- Illicit Discharge Detection and Elimination Program, June 2019
- Sanitary Sewer Overflow (SSO) inventory, updated annually
- Bellingham Outfall Inventory and Dry Weather Screening Field Effort Summary – Spring 2019, June 2019
- Bellingham Outfall Inventory and Dry Weather Screening Field Effort Summary – Spring 2020 and 2021
- Bellingham Outfall Inventory and Dry Weather Screening Field Effort Summary – Permit Year 2, 3, 6 and 7 outfall investigation fieldwork results, Drafted September 2020, Updated August 2024
- Bellingham MS4 Catchment Investigation Procedures, December 2019
- Phase I MS4 System Map, September 2020
- Summary of Bellingham's TMDLs and Impaired Waters, 2018/2020 303(d) Integrated List
- Summary of Bellingham's TMDLs and Impaired Waters, 2022 303(d) Integrated List

The **Construction and Post-Construction Programs** have been updated to include:

- Section 7 of the Planning Board's Procedural Regulations and the Planning Board's As-Built Policy requires the submission of as-built drawings and an operations and maintenance plan for permanent stormwater management systems. The September 2016 Planning Board As-Built Policy Handbook and Certificate are here: https://www.bellinghamma.org/planning-board/pages/built-policy-handbook-certificate
- A report assessing current street design and parking lot guidelines and feasibility of allowing green infrastructure.
- An assessment of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas.

The **Municipal Good Housekeeping Program** has been updated to include:

- Department of Public Works Facility Stormwater Pollution Prevention Plan, January 2021
    - Quarterly inspection records are available from the Bellingham Department of Public Works
- Recycling Center Facility Stormwater Pollution Prevention Plan, January 2021
    - Quarterly inspection records are available from the Bellingham Department of Public Works
- Good Housekeeping and Pollution Prevention Operations and Maintenance Plan, June 2020

The **Charles River Watershed Phosphorus Control Plan** has been updated to include:

- Technical Review of EPA's Small Municipal Separate Storm Sewer Systems (MS4) General Permit Phosphorus Control Plan Obligations for the Town of Bellingham, June 2018
- Legal Analysis, June 2020, updated January 2021 to reflect Stormwater Utility (part of draft Phosphorus Control Plan)
- The Town completed a preliminary financial analysis of various phosphorus reduction and pollutant removal techniques and determined that additional revenue, as well as private property participation, would be required in order to meet the reduction goal. It was determined that a stormwater enterprise fund would be established in part to meet TMDL requirements, which was approved in Permit Year 2. A rate evaluation and 5-year revenue projections were completed and included in the draft Phosphorus Control Plan. On August 24, 2020, the Stormwater Utility Fee Regulations and Stormwater Fee Schedule were presented at a Board of Selectmen meeting and approved. An associated credit policy ("Stormwater Fee Adjustments & Credits") was finalized in September 2020, which incentivizes phosphorus reduction on private property. The first bills were issued in October 2020. More information: https://www.bellinghamma.org/department-public-works/pages/stormwater-utility-fees-regulations-and-adjustment-credit-policy
- The Scope of the PCP has been defined as the urbanized area portion of the Town's jurisdiction within the Charles River Watershed.
- The baseline phosphorus export reduction required from PCP Area and phosphorus load decrease due to changes in land use since 2005 were determined using University of Vermont Spatial Analysis land use and NearMap impervious area data, September 2023 (part of draft Phosphorus Control Plan)
- The Phase 1 Phosphorus Control Plan, June 2023, Updated June 2024

The **SWMP** is updated to include the following information to address Section 3.0 of the General Permit, Additional Requirements for Discharges to Surface Drinking Water Supplies and Their Tributaries:

- EPA's SWMP template does not include provisions to address this requirement. However, this is not applicable to Bellingham because there are no surface drinking water supplies or tributaries to surface drinking water supplies within the MS4.

Reporting includes:

- Year 1 Annual Report and attachments:
  - SSO Inventory (January 1, 2014 – June 30, 2019)
  - Outfall Investigation Summary
  - Spring 2019 Outfall Inventory and Sampling map
  - Illicit Discharge Removal Report
  - Catch Basin Cleaning Optimization Plan Schedule
- Year 2 Annual Report and attachments:
  - Summary of Bellingham's TMDLs and Impaired Waters

  - Outfall Investigation Summary
- Year 3 Annual Report and attachments:
  - Outfall Investigation Summary
- Year 4 Annual Report and attachments:
  - Summary of Bellingham's TMDLs and Impaired Waters
  - Street Sweeping Schedule
- Year 5 Annual Report and attachments:
  - Summary of Bellingham's TMDLs and Impaired Waters
  - Estimate for Street Sweeping Credits (2018)
- Year 6 Annual Report and attachments:
  - Outfall Inventory and Screening Data (delivered electronically)
  - SSO Inventory
  - PCP Phase 1

Amendment Reviewed by: _____

Natalie Koncki
Project Manager
Tighe & Bond

Appendix H

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).

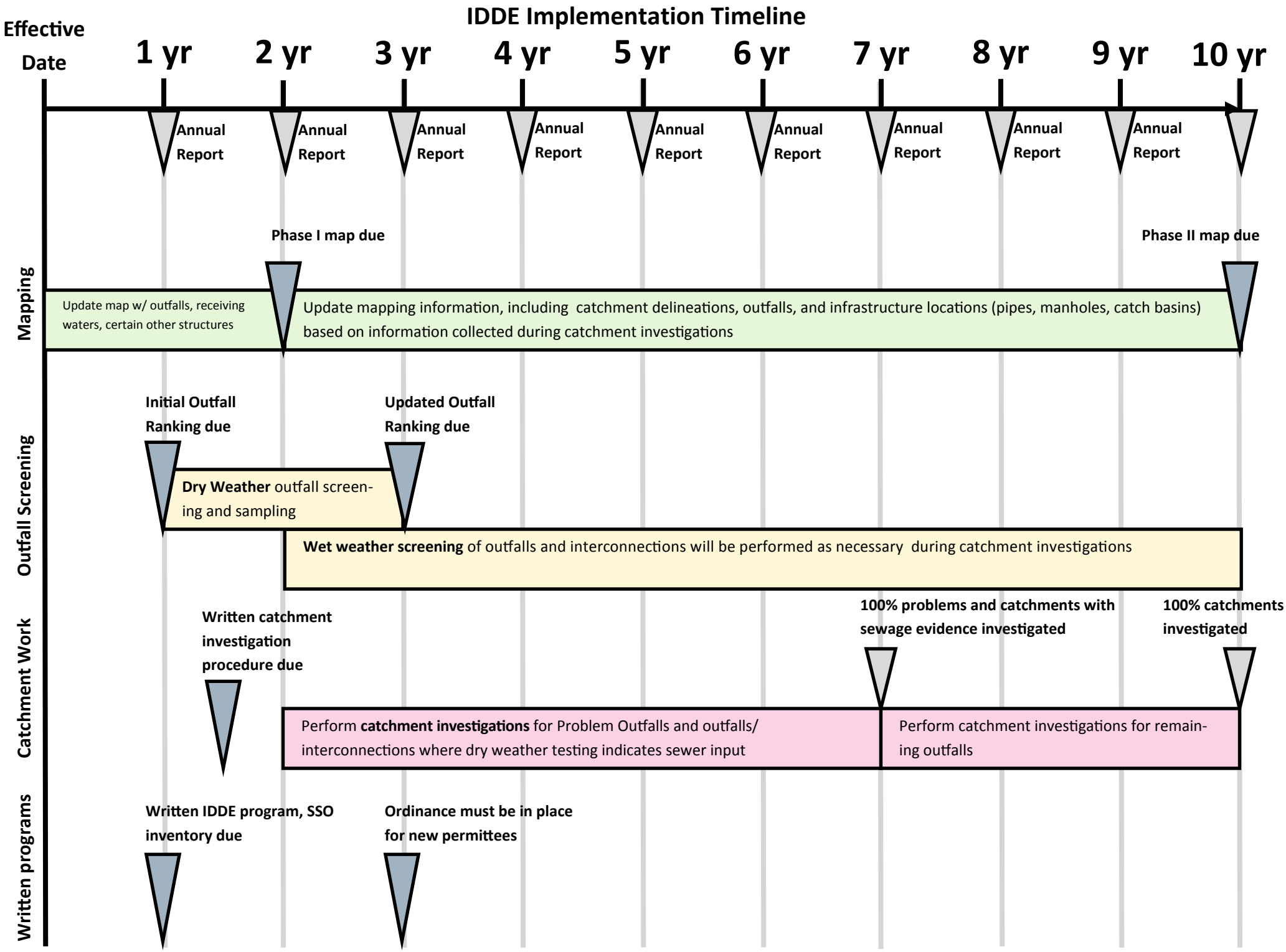
Source: California Stormwater Quality Association, Stormwater BMP Handbook, 2003.

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

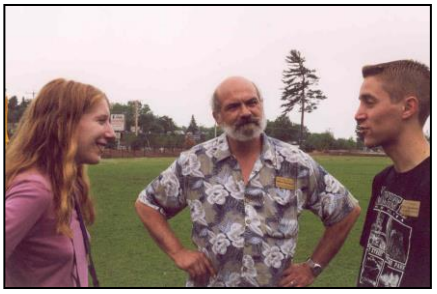
Tips for Organizing and Conducting Volunteer Clean-up Events

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.

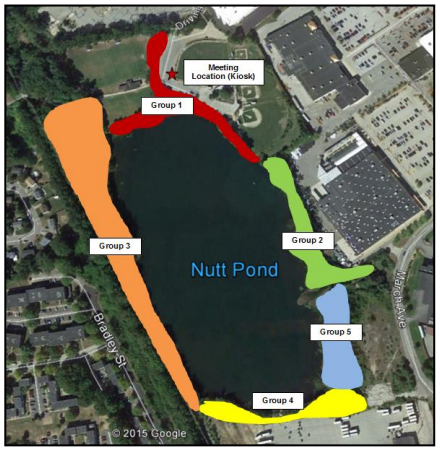
E. Determine the Most Appropriate Age(s) of Your Volunteers: Based upon the task(s) at hand, determine the most appropriate age(s) of your volunteers. Are you seeking adults only? Children? Both? Do you have tasks that all can partake in, or are the tasks age-specific?

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.

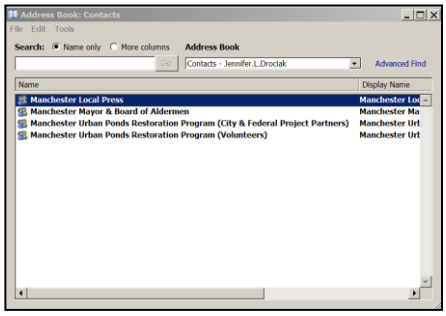
The UPRP has partnered with the Student Conservation Association, local high school ecology clubs, local boy-scout troops, trout-fishing clubs, geo-cashing groups, and others in the past. This has helped garner additional / new volunteers.

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).

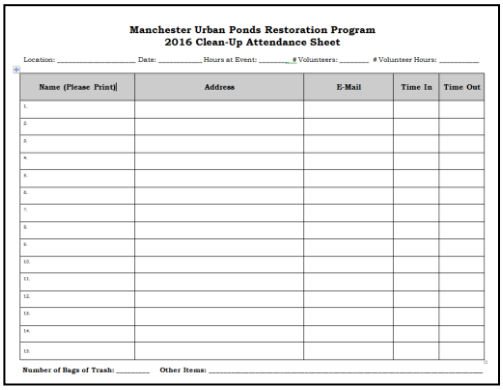
For Example: Seeking volunteers of all ages to assist in an annual trash clean-up at Black Brook and Blodget Park in Manchester on Saturday, April 23, 2016 from 9:00AM – 11:00AM. Volunteers will partner to clean the park and skirt the edges of the brook and wetland complex to remove accumulated trash. 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
City of Manchester Environmental Protection Division
300 Wilson Street - Manchester NH 03103 (603) 645-6099
www.manchesternh.gov/urbanponds

Nutts Pond Facts

- **Namesake:** Named after a local circus performer, "Commodore" George Washington Nutt
- **Location:** Driving Park Road, off of South Willow Street in south Manchester
- **Type of Waterbody:** Natural Pond fed by Tannery Brook
- **Inlet/Outlet:** Tannery Brook, flowing into Nutts Pond to the south of Home Depot, and emptying into the Merrimack River near the Riverwalk in downtown Manchester
- **Watershed Area:** 635 acres
- **Waterbody Size:** 16.1 acres
- **Volume of Water:** 260,500 m³
- **Mean/Average Water Depth:** 13.12 feet
- **Maximum Water Depth:** 30.10 feet
- **Shoreline Length:** 3,116 feet
- **Elevation:** 237 feet
- **Uses:** Paddling, fishing
- **Public Boat Launch:** Gravel, trailer or car-top
- **Amenities:** Prescourt Park athletic fields
- **Local Legend:** "Commodore" Nutt the circus performer who toured with the P.T. Barnum Circus show with Tom Thumb

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The History of Nutts Pond

"Commodore" Nutt

Manchester Urban Ponds Restoration Program

Nutts Pond Stormwater Best Management Practices (BMP) Summary

Footer: Tips for Organizing and Conducting Volunteer Clean-Up Events (01/25/2016) 6

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.

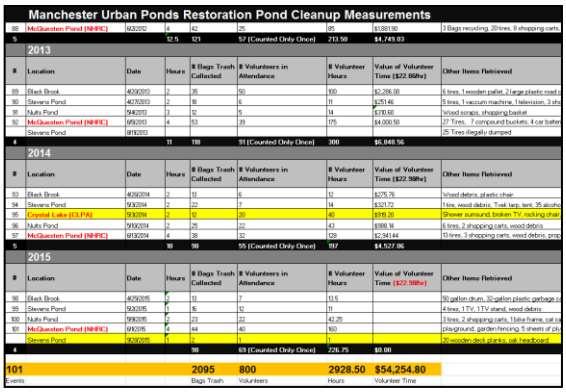
Above Right: Cake served to volunteers at the 100th official cleanup of the Manchester Urban Ponds Restoration Program .

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

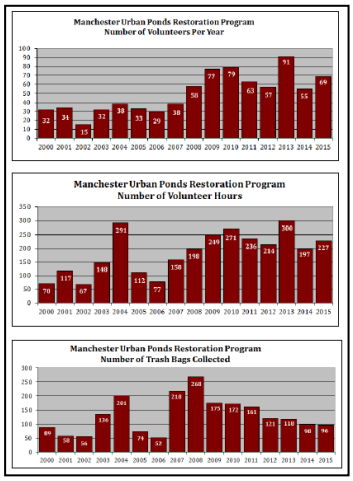
A. Update Your Electronic Records: Now is the time to transpose the information collected on the "Clean-Up Attendance Sheet" into an electronic record-retention system if you have access to one. Perhaps you have access to a database. If not, consider using a Microsoft Excel workbook / spreadsheet system 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.

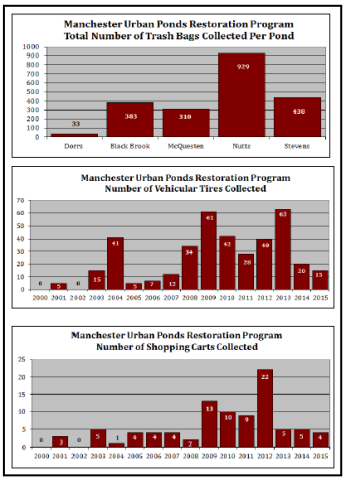
The UPRP has consistently used Microsoft Excel to track clean-up measurements. In the first worksheet of the workbook, we account for the number of our clean-up event, the location, date, hours spent at the event, numbers of bags of trash collected at the event, number of volunteers at the event, number 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
88	McQuesten Pond (NHFIC)	4/3/2012	4	42	25	85	$1,881.80	3 Bags recycling, 20 tires, 8 shopping carts
5			12.5	121	57 (Counted Only Once)	213.50	$4,749.03	
	2013							
89	Black Brook	4/29/2013	2	35	50	100	$2,296.00	6 tires, 1 wooden pallet, 2 large plastic road c
90	Stevens Pond	4/29/2013	2	16	6	11	$251.46	5 tires, 1 vacuum machine, 1 television, 2 sh
91	Nutts Pond	5/4/2013	3	12	5	14	$310.60	Wood scraps, shopping basket
92	McQuesten Pond (NHFIC)	6/5/2013	4	53	39	175	$4,000.50	27 Tires, 7 compound buckets, 4 car batter
	Stevens Pond	6/18/2013						25 Tires illegally dumped
4			11	118	91 (Counted Only Once)	300	$6,848.56	
	2014							
#	Location	Date	Hours	# Bags Trash Collected	# Volunteers in Attendance	# Volunteer Hours	Value of Volunteer Time ($22.96/hr)	Other Items Retrieved
93	Black Brook	4/26/2014	2	13	6	12	$275.76	Wood debris, plastic chair
94	Stevens Pond	5/3/2014	2	22	7	14	$321.72	1 tire, wood debris, Tyvek tarp, tent, 35 alcohc
95	Crystal Lake (CL) PA)	5/3/2014	2	10	20	40	$919.20	Shower surround, broken TV, rocking chair
96	Nutts Pond	5/10/2014	2	25	22	43	$988.14	6 tires, 2 shopping carts, wood debris
97	McQuesten Pond (NHFIC)	6/13/2014	4	38	32	128	$2,941.44	13 tires, 3 shopping carts, wood debris, prop
5			10	108	55 (Counted Only Once)	197	$4,527.06	
	2015							
#	Location	Date	Hours	# Bags Trash Collected	# Volunteers in Attendance	# Volunteer Hours	Value of Volunteer Time ($22.96/hr)	Other Items Retrieved
98	Black Brook	4/25/2015	2	13	7	13.5		50 gallon drum, 32 gallon plastic garbage c
99	Stevens Pond	5/2/2015	2	16	12	11		4 tires, 1 TV, 1 TV stand, wood debris
100	Nutts Pond	5/9/2015	3	23	22	42.25		3 tires, 2 shopping carts, 1 bike frame, cat ca
101	McQuesten Pond (NHFIC)	6/1/2015	4	44	40	160		playground, garden fencing, 5 sheets of ply
	Stevens Pond	6/16/2015	1	1	1	1		10 wooden deck planks, oak headboard
4			10	98	69 (Counted Only Once)	226.75	$0.00	
101				2095	800	2928.50	$54,254.80	
Events				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 I

Annual Reports & Reporting Requirements

Annual Reports

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

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

i. *A self-assessment review of compliance with the permit terms and conditions.*
ii. *An assessment of the appropriateness of the selected BMPs.*
iii. *The status of any plans or activities required by part 2.1 and/ or part 2.2, including:*
    - *Identification of all discharges determined to be causing or contributing to an exceedance of water quality standards and description of response including all items required by part 2.1.1;*
    - *For discharges subject to TMDL related requirements, identification of specific BMPs used to address the pollutant identified as the cause of impairment and assessment of the BMPs effectiveness at controlling the pollutant (part 2.2.1. and Appendix F) and any deliverables required by Appendix F;*
    - *For discharges to water quality limited waters a description of each BMP required by Appendix H and any deliverables required by Appendix H.*
iv. *An assessment of the progress towards achieving the measurable goals and objectives of each control measure in part 2.3 including:*
    - *Evaluation of the public education program including a description of the targeted messages for each audience; method of distribution and dates of distribution; methods used to evaluate the program; and any changes to the program.*
    - *Description of the activities used to promote public participation including documentation of compliance with state public notice regulations.*
    - *Description of the activities related to implementation of the IDDE program including: status of the map; status and results of the illicit discharge potential ranking and assessment; identification of problem catchments; status of all protocols described in part 2.3.4.(program responsibilities and systematic procedure); number and identifier of catchments evaluated; number and identifier of outfalls screened; number of illicit discharges located; number of illicit discharges removed; gallons of flow removed; identification of tracking indicators and measures of progress based on those indicators; and employee training.*
    - *Evaluation of the construction runoff management including number of project plans reviewed; number of inspections; and number of enforcement actions.*
    - *Evaluation of stormwater management for new development and redevelopment including status of ordinance development (2.3.6.a.ii.), review and status of the street design assessment (2.3.6.b.), assessments to barriers to green infrastructure (2.3.6.c), and retrofit inventory status (2.3.6.d.)*

- *Status of the O&M Programs required by part 2.3.7.a.*
- *Status of SWPPP required by part 2.3.7.b. including inspection results.*
- *Any additional reporting requirements in part 3.0.*

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

vi. *Description of activities for the next reporting cycle.*

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

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

Permit Year 1

(May 1, 2018 – June 30, 2019)

Year 1 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: May 1, 2018-June 30, 2019

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed.

Part I: Contact Information

Name of Municipality or Organization: Town of Bellingham

EPA NPDES Permit Number: MAR041091

Primary MS4 Program Manager Contact Information

Name: Donald DiMartino Title: DPW Director

Street Address Line 1: 26 Blackstone Street

Street Address Line 2:

City: Bellingham State: MA Zip Code: 02019

Email: DDiMartino@bellinghamma.org Phone Number: (508) 966-5813

Fax Number: (508) 966-5814

Stormwater Management Program (SWMP) Information

SWMP Location (web address): https://www.bellinghamma.org/department-public-works

Date SWMP was Last Updated: June 2019

If the SWMP is not available on the web please provide the physical address and an explanation of why it is not posted on the web:

Part II: Self Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4.

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☒ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☒ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. ***By checking each box you are certifying that you have completed that permit requirement fully.*** *If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Year 1 Requirements

- ☒ Develop and begin public education and outreach program
- ☒ Identify and develop inventory of all known locations where SSOs have discharged to the MS4 in the last 5 years
  - ◉ The SSO inventory is attached to the email submission
  - ○ The SSO inventory can be found at the following website:
- ☒ Develop written IDDE plan including a procedure for screening and sampling outfalls
- ☒ IDDE ordinance complete
- ☒ Identify each outfall and interconnection discharging from MS4, classify into the relevant category, and priority rank each catchment for investigation
  - ◉ The priority ranking of outfalls/interconnections is attached to the email submission
  - ○ The priority ranking of outfalls/interconnections can be found at the following website:
- ☒ Construction/ Erosion and Sediment Control (ESC) ordinance complete
- ☒ Develop written procedures for site inspections and enforcement of sediment and erosion control measures
- ☒ Develop written procedures for site plan review
- ☒ Keep a log of catch basins cleaned or inspected
- ☒ Complete inspection of all stormwater treatment structures

Annual Requirements

- ☒ Annual opportunity for public participation in review and implementation of SWMP
- ☒ Comply with State Public Notice requirements
- ☒ Keep records relating to the permit available for 5 years and make available to the public
- ☒ Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- ☒ Annual training to employees involved in IDDE program
- ☒ All curbed roadways have been swept a minimum of one time per year

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- ☒ Annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☒ Permittee or its agents disseminate educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- ☒ Provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

- ☒ Increase street sweeping frequency of all municipal owned streets and parking lots to a schedule to target areas with potential for high pollutant loads
- ☐ Prioritize inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings

Charles River Watershed Phosphorus TMDL

- ☒ Begin Phase 1 Phosphorus Control Plan (PCP)

Use the box below to input additional details on any unchecked boxes above or any additional information you would like to share as part of your self assessment:

Bacteria/Pathogens Public Education and Outreach: While disseminating information about proper pet waste management during dog license renewals was not completed during Permit Year 1, multiple educational materials about proper pet waste management have been distributed, posted on the Town's website, and placed on display at municipal buildings throughout the Permit Year. The Town intends to begin distributing messaging during dog license renewals in Permit Year 2.

Solids Good Housekeeping: The Town tracks catch basins cleaning and inspections using a GIS-based tablet application. The tracking form includes depth measurements that can be used to calculate percent full. Therefore, the Town can complete targeted catch basin cleaning to reduce instances of excessive sediment loading. In Permit Year 1, the Town was severely short staffed and the cleaning equipment was not available

until spring of 2019, so the planned cleaning schedule was greatly reduced. Cleaning has been ongoing since spring of 2019, and increased cleaning quantities will be reported in Permit Year 2.

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

Yes ☐ No ☒

If yes, describe below, including any relevant impairments or TMDLs:

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed during the reporting period: 4

Below, report on the educational messages completed during the first year. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.

BMP: 1A Education and Outreach to Residents (Multi-media Methods)

Message Description and Distribution Method:

Educational material on stormwater pollution prevention for households including proper car maintenance and washing, disconnection of downspouts and rain barrel installation, proper lawn maintenance and use of fertilizer, and proper pet waste, dumping, and septic system management was displayed on the Town's website.

Targeted Audience: Residents

Responsible Department/Parties: Planning Board

Measurable Goal(s):

This messaging is available to all visitors of the Town's DPW Stormwater Pollution Prevention for Households webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ☐ No ☒

If yes, describe why the change was made:

BMP: 1D Education and Outreach to Industrial Facilities (Multi-media Methods)

Message Description and Distribution Method:

Educational material on stormwater pollution prevention for industrial sites including illicit discharge elimination, erosion prevention and sediment control, dust control, spill prevention, and salt storage is displayed on the Town's website.

Targeted Audience: Industrial Facilities

Responsible Department/Parties: Planning Board

Measurable Goal(s):

This messaging is available to all visitors of the Town's Planning Board Stormwater Management Best

Practices webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ☐ No ☒

If yes, describe why the change was made:

BMP: 1B Education and Outreach to Businesses (Multi-media Methods)

Message Description and Distribution Method:

Educational material on stormwater pollution prevention for businesses including the importance and benefits of pollution prevention, source reduction, reuse/recycling, energy recovery, and best management practices for anti-icing to minimize sand and salt use is displayed on the Town's website.

Targeted Audience: Businesses, Institutions, and Commercial Facilities

Responsible Department/Parties: Planning Board

Measurable Goal(s):

This messaging is available to all visitors of the Town's Planning Board Stormwater Management Best Practices webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ☐ No ☒

If yes, describe why the change was made:

BMP: 1C Education and Outreach to Developers (Multi-media Methods)

Message Description and Distribution Method:

Educational materials on stormwater pollution prevention for developers including site selection, low impact development practices, sediment and erosion control measures, and other methods to prevent stormwater pollution are displayed on the Town's website. Additionally, a handout entitled "10 Steps to Stormwater Pollution Prevention on Small Residential Construction Sites" is distributed by the Building Department to to all contractors seeking a building permit for all sites with an acre of disturbance or more.

Targeted Audience: Developers

Responsible Department/Parties: Planning Board

Measurable Goal(s):

This messaging is available to all visitors of the Town's Planning Board Stormwater Management Best Practices webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ☐ No ☒

If yes, describe why the change was made:

BMP:

Message Description and Distribution Method:

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Message Date(s):

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ☐ No ☐

If yes, describe why the change was made:

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) during the reporting period:

The Stormwater Management Plan (SWMP) was posted for public review and made publicly available on the

Town's website. The SWMP was also presented at a public Planning Board meeting on August 23, 2018 where public comments and feedback were solicited. State Public Notice requirements were followed, and the Planning Board meeting was advertised in advance.

Was this opportunity different than what was proposed in your NOI? Yes ☐ No ☒

Describe any other public involvement or participation opportunities conducted during the reporting period:

The Town sponsored an annual Earth Day Charles River Cleanup on April 27, 2019, where local volunteers conducted a cleanup throughout the Charles River watershed.

The Town's DPW held Yard Waste Curbside Pickup days on October 30, 2018 and May 7, 2019.

The Board of Health hosted an annual Household Hazardous Waste Day on June 22, 2019.

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Below, report on the number of SSOs identified in the MS4 system and removed during this reporting period.

Number of SSOs identified: 1

Number of SSOs removed: 1

Below, report on the total number of SSOs identified in the MS4 system and removed to date. At a minimum, report SSOs identified since 2013.

Total number of SSOs identified: 5

Total number of SSOs removed: 5

MS4 System Mapping

Describe the status of your MS4 map, including any progress made during the reporting period (phase I map due in year 2):

Most Phase I mapping elements are complete. Many Phase II mapping elements are complete, including manholes, catch basins, and most connectivity. The Town will continue to improve the map as modifications are made and the IDDE Program is implemented.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses.

- ◉ The outfall screening data is attached to the email submission
- ○ The outfall screening data can be found at the following website:

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

Number of outfalls screened: 72

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

Percent of total outfalls screened: 27

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- ○ The catchment investigation data is attached to the email submission
- ◉ The catchment investigation data can be found at the following website:

Not applicable

Below, report on the number of catchment investigations completed during this reporting period.

Number of catchment investigations completed this reporting period: 0

Below, report on the percent of catchments investigated to date.

Percent of total catchments investigated: 0

Optional: Provide any additional information for clarity regarding the catchment investigations below:

No catchment investigations were completed in Permit Year 1 as investigations of problem catchments are not required to begin until Permit Year 2. Additionally, the Town has not identified any problem catchments.

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- ◉ The illicit discharge removal report is attached to the email submission
- ○ The illicit discharge removal report can be found at the following website:

Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed during this reporting period.

Number of illicit discharges identified: 1

Number of illicit discharges removed: 1

Estimated volume of sewage removed: 175-250 (est.) gpd

Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed since the effective date of the permit.

Total number of illicit discharges identified: 1

Total number of illicit discharges removed: 1

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

Employee Training

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

An IDDE employee training was held in 2018, and an inter-departmental meeting was held on May 16, 2019, which reviewed the overall purpose and scope of the IDDE program and IDDE Program responsibilities. An IDDE form for documenting illicit discharges was updated and is stored in DPW trucks for use in the event of an illicit discharge. Town staff attended the Metropolitan Area Planning Council's Climate Resiliency workshop on March 19, 2019 and Charles River Watershed Associations's Climate Compact on August 1, 2019 which discussed moving towns, regions, and watersheds forward toward improved stormwater management.

MCM4: Construction Site Stormwater Runoff Control

Below, report on the construction site plan reviews, inspections, and enforcement actions completed during this reporting period.

Number of site plan reviews completed: 19

Number of inspections completed: 474

Number of enforcement actions taken: 0

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance Development

Describe the status of the post-construction ordinance required to be complete in year 2 of the permit term:

Section 7 of the Planning Board's Procedural Regulations includes requirements for post-construction stormwater management. The Town will review existing regulations to determine whether updates or additions are needed to meet the requirements of the General Permit in Permit Year 2.

As-built Drawings

Describe the status of the measures the MS4 has utilized to require the submission of as-built drawings and ensure long term operation and maintenance of completed construction sites required to be complete in year 2 of the permit term:

This requirement has been met through the adoption of Section 7 of the Planning Board's Procedural Regulations and the Planning Board's As-Built Policy, which requires the submission of as-built drawings and an operations and maintenance plan for permanent stormwater management systems.

Street Design and Parking Lots Report

Describe the status of the street design and parking lots assessment due in year 4 of the permit term, including any planned or completed changes to local regulations and guidelines:

Preparation for the Street Design and Parking Lots Report has not yet begun as this requirement is due in Permit Year 4.

Green Infrastructure Report

Describe the status of the green infrastructure report due in year 4 of the permit term, including the findings and progress towards making the practice allowable:

Preparation for the Green Infrastructure Report has not yet begun as this requirement is due in Permit Year 4.

Retrofit Properties Inventory

Describe the status of the inventory, due in year 4 of the permit term, of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

Preparation for the Retrofit Properties Inventory has not yet begun as this requirement is due in Permit Year 4.

MCM6: Good Housekeeping

Catch Basin Cleaning

Describe the status of the catch basin cleaning optimization plan:

A schedule to complete data collection for the catch basin cleaning optimization plan is attached.

If complete, attach the catch basin cleaning optimization plan or the schedule to gather information to develop the optimization plan:

- (●) The catch basin cleaning optimization plan or schedule is attached to the email submission
- ( ) The catch basin cleaning optimization plan or schedule can be found at the following website:

Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins during this reporting period.

Number of catch basins inspected: 145

Number of catch basins cleaned: 145

Total volume or mass of material removed from all catch basins: 100 Cubic Yards

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

Total number of catch basins: 2,423

If applicable:

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

Street Sweeping

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

Written procedures for street sweeping will be formalized during development of a written operation and maintenance plan in Permit Year 2. The Town completed street sweeping twice throughout the reporting period, sweeping 62 miles of road in the fall and 107 miles of road and all municipal and school parking lots in the spring.

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

- (●) Number of miles cleaned: 169
- ( ) Volume of material removed: [UNITS]
- ( ) Weight of material removed: [UNITS]

If applicable:

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

Winter Road Maintenance

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

Written procedures for winter road maintenance will be formalized during development of a written operation and maintenance plan in Permit Year 2.

Inventory of Permittee-Owned Properties

Describe the status of the inventory, due in year 2 of the permit term, of permittee-owned properties, including parks and open spaces, buildings and facilities, and vehicles and equipment, and include any updates:

The Town has created an initial inventory of Town-owned properties in Permit Year 1, which will be finalized pending confirmation of several properties and site inspections during Permit Year 2.

O&M Procedures for Parks and Open Spaces, Buildings and Facilities, and Vehicles and Equipment

Describe the status of the operation and maintenance procedures, due in year 2 of the permit term, of permittee-owned properties (parks and open spaces, buildings and facilities, vehicles and equipment) and include maintenance activities associated with each:

Operation and maintenance procedures associated with the properties included in the inventory will be formalized during development of a written operation and maintenance plan in Permit Year 2.

Stormwater Pollution Prevention Plan (SWPPP)

Describe the status of any SWPPP, due in year 2 of the permit term, for permittee-owned or operated facilities including maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater:

The Town will identify what properties and facilities are in need of a SWPPP and will prepare these in accordance with the General Permit in Permit Year 2.

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

Number of site inspections completed: N/A

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

N/A

O&M Procedures for Stormwater Treatment Structures

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

Written procedures for operation and maintenance of stormwater treatment structures will be formalized during development of a written operation and maintenance plan in Permit Year 2.

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- (●) Not applicable
- ( ) The results from additional reports or studies are attached to the email submission
- ( ) The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

Bellingham completed a portion of the dry weather screening field effort at the end of Permit Year 1. The data included in this annual report should be considered draft as it is being finalized by the Town's stormwater consultant. The Town continues to implement its IDDE Program and complete dry weather outfall screening in accordance with the General Permit schedule.

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 2 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Complete system mapping Phase I
- Begin investigations of catchments associated with Problem Outfalls
- Develop or modify an ordinance or other regulatory mechanism for post-construction stormwater runoff from new development and redevelopment
- Establish and implement written procedures to require the submission of as-built drawings no later than two years after the completion of construction projects
- Develop, if not already developed, written operations and maintenance procedures
- Develop an inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; review annually and update as necessary
- Establish a written program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner
- Develop and implement a written SWPPP for maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater
- Enclose or cover storage piles of salt or piles containing salt used for deicing or other purposes
- Develop, if not already developed, written procedures for sweeping streets and municipal-owned lots
- Develop, if not already developed, written procedures for winter road maintenance including storage of salt and sand
- Develop, if not already developed, a schedule for catch basin cleaning
- Develop, if not already developed, a written procedure for stormwater treatment structure maintenance
- Develop a written catchment investigation procedure *(18 months)*

<u>Annual Requirements</u>

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4 in the last 5 years
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all uncurbed streets at least annually

Provide any additional details on activities planned for permit year 2 below:

The Town acknowledges the General Permit Year 2 requirements and will complete as many activities as possible based on funding and staff availability.

Part V: Certification of Small MS4 Annual Report 2019

40 CFR 144.32(d) Certification

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

Name:	Donald DiMartino	Title:	DPW Director
Signature:		Date:	9/25/2019

[Signatory may be a duly authorized representative]

SSO Inventory for Bellingham, MA (January 1, 2014 – June 30, 2019)

Below is a summary table of sanitary sewer overflows that have occurred in the Town of Bellingham from 2014 through June 30, 2019. Following the summary table are detailed descriptions of each SSO occurrence. These SSOs have been reported to MassDEP in accordance with state regulations.

Date	Time	Location	Discharge to surface water or MS4	Estimated SSO Volume	Cause of SSO	Mitigation/Corrective Measures Completed
1/13/2014	1:20 PM	Pine Grove Ave.	Yes – Pete's River	2,000 Gallons	Blockage	See detailed descriptions below
2/27/2015	1:00 PM	Pine Grove Ave.	Yes – Pete's River	100 Gallons	Blockage	
3/21/2015	5:00 PM	Wrentham Manor	No	3,900 Gallons	Pump/Lift Station Failure	
10/25/2015	4:30 PM	Old Bridge Lane Sewer Station	No	8,000 – 10,000 gallons	Pump/Lift Station Failure	
8/2/2018	8:00 PM	Wrentham Manor	No	2,000 Gallons	Pump/Lift Station Failure	

Detailed descriptions:

- On **January 14th, 2014** at approximately 1:20 PM, the Sewer Department was notified of sewage coming out of manhole on Pine Grove Ave. After responding and investigating, it was discovered that a brick had fallen into the flow channel blocking flow through the siphon. Sewer department staff removed debris from the flow channel and patched under the casting with cement. The total volume of wastewater discharged to Pete's River was estimated to be 2,000 gallons.

- On **February 27th, 2015** at approximately 1:00 PM, the Sewer Department was notified of sewage coming out of a manhole on Pine Grove Ave. After responding and investigating, a brick from the SMH invert was discovered to be blocking the upper end of the siphon. The total volume of wastewater discharged to Pete's River was approximately 100 gallons. Town staff removed the brick from the invert and pumped out and jetted the lines. Town staff made plans to reconstruct the brickwork.

- On **March 21st, 2015** at approximately 5:00 PM, the Sewer Department was notified of sewage coming out of a manhole at Wrentham Manor (Wrentham Road). After responding and investigating, it was discovered that the pump had shorted out and killed power to the entire control and alarm panel. The total volume of water discharged to the lawn area of the housing authority was approximately 3,900 gallons. Town staff repaired both pumps. The force main may be frozen, as the heat tape breaker was off. The town continues to have issues with the force main pipe. The pumps are operating but not pumping out the force main. The town staff has jet cleaned much of the force main but have more to do. Town staff is manually monitoring the wet well while debugging the force main issue.

- On **October 25th, 2015** at approximately 4:30 PM, the Sewer Department was notified of sewage coming out of a manhole at the Old Bridge Lane Sewer Station. After responding and investigating, it was discovered that the automated controls did not start the pumps at the sewer station, and that the alarm system did not send an alarm. The total volume of wastewater discharged to the ground surface (no receiving water was impacted) was approximately 8,000 – 10,000 gallons. There were no signs of any puddles of wastewater or flow in any adjacent areas. The nearest wetlands are >175' away. Release flow was minimal (flow from 92 condo units and fire station). The flow was not sufficient enough to create an observable channel in pine needles on the ground surface. The pump controls were reset and operational by 11/25 noon.

- On **August 2nd, 2018** at approximately 8:00 PM, the Sewer Department was notified of sewage coming out of a manhole at Wrentham Manor (Wrentham Road). After responding and investigating, it was discovered that the pump/lift station failed and that the Mission Dialer failed to call out the alarms. The total volume of wastewater discharged to groundwater was approximately 2,000 gallons (no receiving water was impacted). Town staff repaired both pumps and investigated pump changes to eliminate clogging. The town is working with an electrician to get an alarm if power is lost due to mission dialer unit.

Permit Year 1 Outfall Investigation Summary

The *Bellingham Outfall Inventory and Dry Weather Screening Field Effort Summary – Spring 2019* memorandum is included in the Bellingham IDDE Program available from the Bellingham Department of Public Works.

Illicit Discharge Removal Report

The Town of Bellingham

Reporting Period: May 1, 2018 – June 30, 2019

The Town of Bellingham has found one (1) illicit discharge during the reporting period. The source was a direct discharge from a septic system at 21 Wrentham Road, which discharged into Peters River. The discharge did not enter the drainage system.

The Board of Health received a complaint that grey water was discharging directly into the river. On May 6, 2019, the owner informed the DPW Assistant Director that he was not going to modify his drain that was discharging to the river. On May 9, 2019, the Board of Health took enforcement action by sending the owner a letter that gave him 14 days to pull a permit to tie the discharge into the existing septic system. On May 15, 2019, the owner filed a permit with the town to tie into the on-site septic system. On June 25, 2019, the Health Agent completed a final inspection that the discharge had been removed from the river and was tied into the septic system

Following this repair, the owner then submitted a sewer service connection application to DPW and connected to sewer on August 8, 2019. A final inspection was completed by DPW on the same date.

The volume of sewage removed from the discharge was conservatively estimated based on typical residential sewer use: 2.5 people per household (avg) x 70 gpd (avg) = 175-250 gpd.

Bellingham Catch Basin Cleaning Optimization Plan Schedule

TO: Bellingham Stormwater Management Program Files

DATE: September 2019

Section 2.3.7.a.iii.2 of the 2016 Small MS4 General Permit requires that Bellingham optimize routine inspections, cleaning, and maintenance of catch basins to meet the following criteria:

- Prioritize inspection and maintenance for catch basins located near construction activities and clean catch basins more frequently if excessive sediment or debris loadings is found.
- Establish a catch basin cleaning schedule that ensures no catch basin is ever more than 50 percent full.

Historically, Town-owned catch basins have been cleaned by Town staff on a rotating basis. The Town has employed a GIS-based tablet application to track catch basin cleaning and inspections, including tracking depth to sediment and depth to the bottom of the basin, which can be used to calculate the percent full. During Permit Year 1, the Town intended to clean each basin at least once annually and record information in GIS. Due to being severely short staffed during a significant duration of the permit year reporting period and necessary catch basin cleaning equipment arriving later than anticipated, Bellingham was unable to achieve the anticipated Town-wide cleaning in Permit Year 1.

In Permit Year 2, the Town is focusing cleaning efforts on catch basins that were not cleaned in Permit Year 1 and is anticipating completing the Town-wide cleaning now that the Town is fully staffed. Additionally, the Town will continue to track sediment loading in catch basins during future cleanings. The data collected during future rounds of catch basin cleaning will be analyzed to determine which catch basins require more frequent cleaning, to help to prioritize cleaning locations, and to identify and address areas in Town that may experience excessive sediment or debris loading.

The catch basin cleaning optimization plan will be finalized in conjunction with development of the written Town-wide infrastructure operation and maintenance program due at the end of Permit Year 2 and updated as the catch basin cleaning program is implemented throughout the Permit Term.

Tighe&Bond
Engineers | Environmental Specialists

B-0852-001
June 30, 2018

Mr. Donald DiMartino, DPW Director
Department of Public Works
26 Blackstone Street
Bellingham, MA 02019

Re: **Technical Review of EPA's Small Municipal Separate Storm Sewer Systems (MS4) General Permit Phosphorus Control Plan Obligations for the Town of Bellingham**

Dear Mr. DiMartino,

As you are aware, the Environmental Protection Agency's (EPA's) Small MS4 General Permit will require Bellingham to reduce phosphorus loadings to the Charles River and its tributaries by developing and implementing a Phosphorus Control Plan (PCP) that considers structural and non-structural practices to reduce the discharge of phosphorus in stormwater. EPA expects an iterative planning and implementation process, with interim phosphorus reduction milestones and a fully implemented PCP within 20 years of the permit effective date. As of the date of this letter, EPA is expecting the Small MS4 General Permit to become effective on July 1, 2018.

Tighe & Bond has prepared this letter report to provide Bellingham with a better understanding of the PCP requirements along with the effort and order of magnitude cost to complete the first phase of PCP planning and implementation, which is through Permit Year 10 (i.e., ending June 30, 2028). In our evaluation, we have considered phosphorus reduction progress since 2005 and calculated the remaining load reduction required by the end of Phase 1. We have also reviewed the September 2011 *Sustainable Stormwater Funding Evaluation for the Upper Charles Communities of Bellingham, Franklin, and Milford, MA* by Horsley Witten Group, Inc. and the August 2011 *Subwatershed Management Plan for Bellingham MA* by Charles River Watershed Association and Nitsch Engineering, Inc. and provided a third-party opinion to the Town regarding applicability of recommendations and costs given changes to State and Federal regulations.

Our goal with this letter report is to guide Bellingham with the big picture decisions to begin the PCP related to:

1. Implementing a PCP for the whole Town within the Charles River watershed or focusing the PCP on the MS4 (Urbanized) area in the watershed;
2. Quantifying the phosphorus reduction progress since 2005; and
3. Determining what recommendations from previous studies are actually cost-effective and may warrant inclusion in the PCP.

While this letter report is not the PCP, it will provide Bellingham with key information that should be further examined, expanded upon, and ultimately incorporated into the PCP as the Town continues to address EPA's requirements.

1. Overview of Small MS4 Permit Requirements for Phosphorus Control

On April 4, 2016, EPA Region 1 released a final Small MS4 General Permit for Massachusetts that has an anticipated effective date of July 1, 2018. This permit includes requirements to reduce pollutants of concern for impaired waterbodies, such as the Charles River.

A finalized Total Maximum Daily Load (TMDL) to reduce nutrients[1] in the Charles River watershed was approved by EPA on June 10, 2011. Phosphorus is a nutrient that, when present at high levels in natural waterbodies, can cause overgrowth of aquatic plants, increased harmful algal blooms, decreased light in a waterbody, and decreased levels of dissolved oxygen. Phosphorus is a common pollutant in stormwater, with sources including leaf litter, pet waste, road salt, fertilizer, and atmospheric deposition. A variety of structural and non-structural Best Management Practices (BMPs) can be effective at reducing phosphorus loads from stormwater.

To reduce the phosphorus load to the River consistent with the established TMDL, MS4 permittees within the Charles River watershed must develop and implement a PCP as part of their Stormwater Management Program. The permit has a five-year term; however, the PCP includes obligations that extend for two decades. Appendix F of the Small MS4 General Permit presents the requirements. We have summarized them in the following paragraphs.

The following figure shows the phases of the PCP. In general, EPA expects communities to take an adaptive management approach that calls for an iterative planning, implementation, and evaluation process and allows for an opportunity to adjust the PCP in the next iteration of planning. This approach benefits affected communities as it allows for changes to be made during planning and implementation to address things that are not working or are no longer feasible.

1-5 years after permit effective date	5-10 years after permit effective date	10-15 years after permit effective date	15-20 years after permit effective date
Create Phase 1 Plan	Implement Phase 1 Plan		
	Create Phase 2 Plan	Implement Phase 2 Plan	
		Create Phase 3 Plan	Implement Phase 3 Plan

FIGURE 1: PCP Timeline from Appendix F of the 2016 Small MS4 Permit

Permittees are required to fully implement the PCP no later than 20 years after the effective date of the permit (i.e., July 1, 2038). EPA has set intermediate deadlines for compliance as part of each phase of the PCP. Table 1 shows components of creating and implementing the Phase 1 PCP and associated deadlines.

[1] *Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River,* available online at: http://www.mass.gov/eea/docs/dep/water/resources/n-thru-y/ucharles.pdf

TABLE 1
PCP Phase 1 Deadlines

Item Number	Phase 1 of the PCP Component and Milestones	Completion Date
1-1	Legal Analysis	July 1, 2020
1-2	Funding Source Assessment	July 1, 2021
1-3	Define Scope of PCP (PCP Area) Baseline Phosphorus Load and Phosphorus Reduction Requirement and Allowable Phosphorus Load	July 1, 2022
1-4	Description of Phase 1 planned non-structural controls	July 1, 2023
1-5	Description of Phase 1 planned structural controls	July 1, 2023
1-6	Description of Operation and Maintenance program for structural controls	July 1, 2023
1-7	Phase 1 implementation schedule	July 1, 2023
1-8	Estimated cost for implementing Phase 1 of the PCP	July 1, 2023
1-9	Complete Written Phase 1 PCP	July 1, 2023
1-10	Full implementation of nonstructural controls	July 1, 2024
1-11	Performance Evaluation	July 1, 2024 & July 1, 2025
1-12	1. Performance Evaluation 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load plus the applicable Phosphorus Reduction Requirement multiplied by 0.8 (i.e., 20% reduction)	July 1, 2026
1-13	Performance Evaluation	July 1, 2027
1-14	1. Performance Evaluation 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load plus the applicable Phosphorus Reduction Requirement multiplied by 0.75 (i.e., 25% reduction)	July 1, 2028

Bellingham will be required to include progress reports on the planning and implementation of their PCP in Annual Reports to EPA and the Massachusetts Department of Environmental Protection (MassDEP), starting with the first report. Beginning five years after the effective permit date (i.e., July 1, 2023), permittees are required to submit additional information with their Annual Report related to the PCP, including the following:

- All non-structural control measures implemented during the reporting year with the phosphorus reduction in mass per year calculated consistently with the procedures in Attachment 2 to Appendix F of the permit.
- Structural controls implemented during the reporting year and all previous years including:

  - Location information (GPS coordinates or street address);
  - Phosphorus reduction from all structural BMPs implemented as part of the PCP to date in mass/year, calculated consistently with the procedures in Attachment 3 to Appendix F of the permit; and
  - Date of last completed maintenance and inspection for each structural control.
- Phosphorus load increases due to development over the previous reporting period and incurred since 2005 calculated consistently with the procedures in Attachment 1 to Appendix F of the permit.
- Estimated yearly phosphorus export rate from the PCP Area.
- Certification that all structural BMPs are being inspected and maintained according to the O&M program specified as part of the PCP.
- Certification that all municipally owned and maintained turf grass areas are being managed in accordance with Massachusetts Regulation 331 CMR 31 pertaining to the proper use of fertilizers on turf grasses.

2. Phosphorus Reduction from EPA-Prescribed BMPs

The Small MS4 General Permit is prescriptive in what BMPs can be used to get "credit" for phosphorus removal.

Non-structural BMPs

Non-structural controls defined by the 2016 permit include the following:

- Enhanced Street Sweeping Program (credits depend on type of sweeper and frequency of sweeping)
- Catch Basin Cleaning
- Organic Waste and Leaf Litter Collection Program

In addition, the permit describes calculations for determining the load reduction of phosphorus from the implementation of the following non-structural/semi-structural BMPs:

- Impervious Area Disconnection through Storage (rain barrels, cisterns, etc.)
- Impervious Area Disconnection
- Conversions of Impervious Area to Permeable Pervious Area
- Soil Amendments to Enhance Permeability of Pervious Areas

Structural BMPs

The 2016 permit provides methods to determine phosphorus load reductions from the following structural BMPs:

- Infiltration Trench
- Infiltration Basin or other surface infiltration practice
- Biofiltration Practice
- Gravel Wetland System
- Porous Pavement
- Wet Pond or Wet Detention Basin

- Dry Pond or Detention Basin
- Dry Water Quality Swale/Grass Swale

It is assumed that the Town will be able to report phosphorus removal credit for structural BMPs that either fall into one of the categories listed above, or have the same functionality as those listed above, per guidance in Attachment 3 of Appendix F of the Permit.

In Attachment 3 to Appendix F, EPA provides specific calculations for each structural BMP to determine total phosphorus load reduction "credit" that are based on contributing drainage area cover, depth of runoff treated, storage volume, soils type, etc. EPA has also released a stormwater management optimization tool ("Opti-tool"), which is a spreadsheet-based model designed to conduct both watershed-wide planning level analyses as well as detailed site-specific analyses for estimating regional long-term cumulative pollutant load and runoff volume reduction performances for 11 categories of structural BMPs. Output also allows users to evaluate the cost and benefit of various BMPs. According to discussions with EPA and trainings attended by Tighe & Bond staff, the calculations presented in the Opti-tool are consistent with the Small MS4 General Permit.

3. Bellingham's Phosphorus Reduction Goals

EPA has calculated a baseline phosphorus load and phosphorus reduction goals for each municipality in the Charles River watershed using information provided in the TMDL and more recent land use information available through MassGIS. As required by the PCP, communities must define the scope of the PCP (PCP Area) and associated Baseline Phosphorus Load, Phosphorus Reduction Requirement, and Allowable Phosphorus Load. EPA provides communities with two options for the PCP Area. To reduce the discharge of phosphorus, they can implement non-structural and structural BMPs within either:

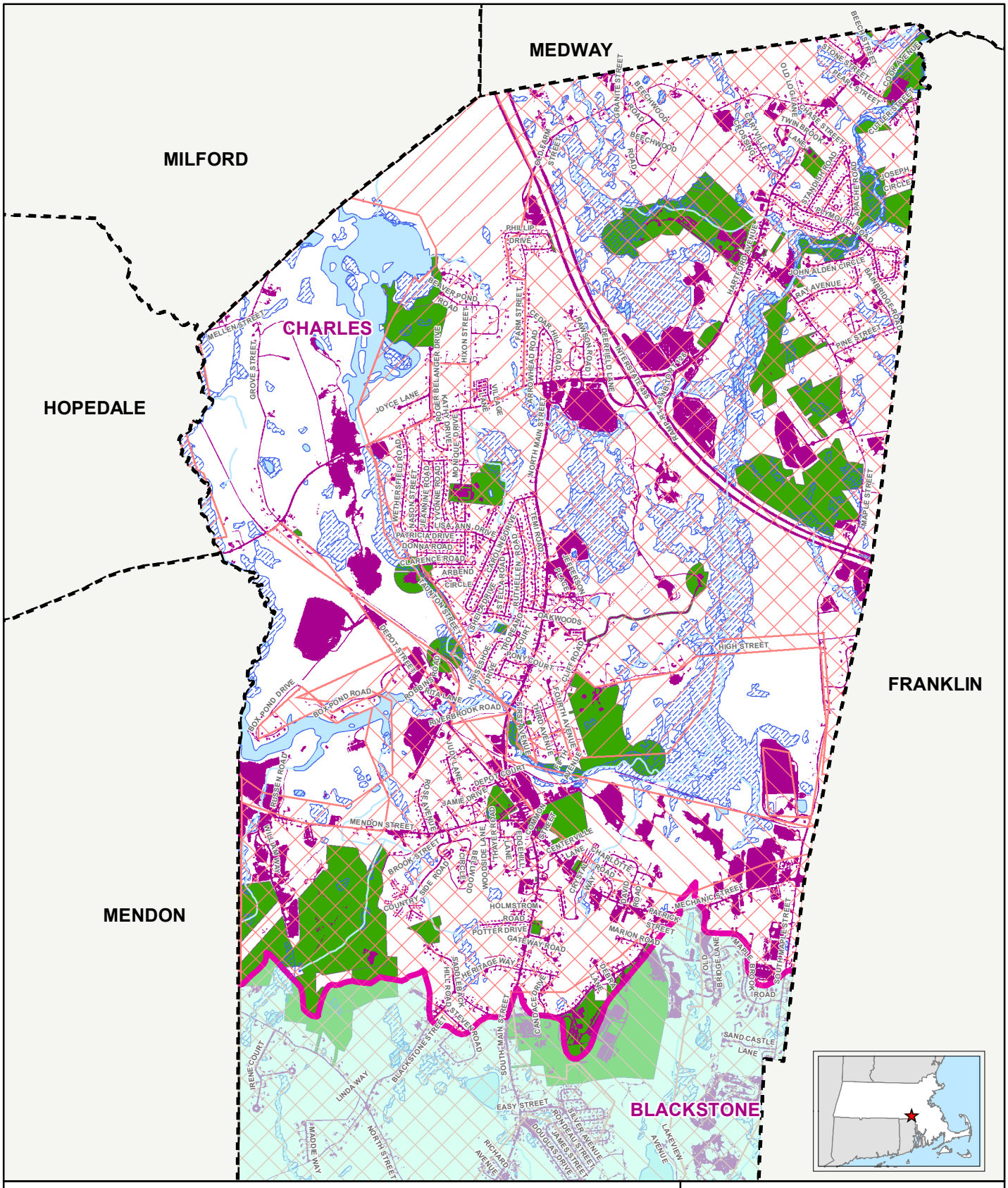
1. The entire area of Town within the Charles River watershed; or
2. Only in the Urbanized Area within the Charles River watershed.

Figure 2 shows the portion of Bellingham within the Charles River watershed and the portion of Town that is considered Urbanized Area, along with impervious area and Town-owned parcels. Table 2 lists the current load estimate and reduction goal for both the whole community and for only the urbanized area.

TABLE 2

Annual Phosphorus Load Reduction Requirements for Bellingham

Charles River Watershed Area in:	Baseline Phosphorus Load in lb/year (kg/yr)	Stormwater Phosphorus Load Reduction Requirement in lb/year (kg/yr)	Allowable Phosphorus Load in lb/year (kg/yr)	Stormwater Percent Reduction in Phosphorus Load (%)
Bellingham	2,088 (947)	730 (331)	1,358 (616)	35%
Urbanized Area of Bellingham	1,766 (801)	642 (291)	1,124 (510)	36%
	Difference:	88 (40)		



Legend

- Town-owned Parcels
- Charles River Watershed
- Blackstone River Watershed
- Impervious Area
- MS4 Regulated Area (2000 Census)
- MS4 Regulated Area (2010 Census)
- Town Boundary
- Stream/Intermittent Stream
- Inland Wetlands
- Coastal Wetlands
- Public Surface Water Supply
- Lake, Pond, River or Impoundment

1 inch equals 3,000 feet

0 1,500 3,000

Feet

Tighe&Bond
Engineers | Environmental Specialists

Based on MassGIS Color Orthophotography (2013)

FIGURE 2
CHARLES RIVER WATERSHED

Phosphorus Control Plan
Bellingham, Massachusetts

May 2018

G:\GIS\MA\BellinghamMA\avproj\Figure2ImperviousAreaCharles.mxd

M-1755

The permit contains a schedule of interim removal goals of the total phosphorus reduction with the different phases of the PCP. Removal percentages of the total reduction and the corresponding pounds of phosphorus to be removed by the interim deadlines are included in Table 3.

TABLE 3

Phosphorus Load Reduction within the Charles River Watershed

Permit Year	Percent Reduction	Load to be Reduced in Total Town Area (lbs/year)	Load to be Reduce in Urbanized Area (lbs/year)	Difference (lbs/year)
Year 8	20%	146	128	18
Year 10	25%	183	161	22
Year 13	35%	256	225	31
Year 15	50%	365	321	44
Year 18	70%	511	449	62
Year 20	100%	730	642	88

A decision must be made whether the Town should implement the PCP in the entire area of Town within the Charles River watershed or only within the Urbanized Area of the Town area within the Charles River Watershed.

To make this decision, we considered the following factors:

- The relative difference in load reduction between the two options. Deciding to reduce the phosphorus load town-wide in the watershed instead of only in the Urbanized Area requires 14% more total phosphorus to be addressed through structural or non-structural BMPs. The difference is 22 lbs/year in implementation of Phase 1 of the PCP and 88 lbs/year by the end of the final phase of the PCP. This difference cannot be addressed with non-structural BMPs alone and therefore would require between 5 and 15 structural BMPs to be installed to account for the remaining load reduction, which increases cost of completing the PCP. Costs to construct BMPs are discussed in Section 4 of this report.
- Impervious area. Impervious cover is denser and more extensive within the Urbanized area (16% of the Urbanized area is impervious), while impervious cover outside the Urbanized Area is less dense and covers less of the area (only 9.5% of the remainder of the watershed is impervious). EPA calculations estimate higher loads of total phosphorus come from impervious area than pervious area, and therefore it is more cost-effective to install retrofits that treat impervious area. With less impervious cover outside of the Urbanized Area, there are fewer opportunities for siting larger, structural BMPs that provide cost-effective load reduction.
- Available municipal land for retrofit installation. There are 61 town-owned parcels within the entire watershed and all but two are within the urbanized area. Municipally-owned parcels and the road right-of-way are the first places to consider structural BMP installation as they are within the Town's control for construction and long-term operation and maintenance. There is 37 acres of impervious area on Town-owned parcels in the Urbanized area and only 1.49 acres of impervious cover on Town parcels outside of the Urbanized area, further indicating there are more opportunities within the Urbanized Area to install retrofits on Town-owned parcels

Based on these considerations, we recommend Bellingham undertake the PCP within the Urbanized Area only. According to Table 3, this translates to phosphorous load reduction goals of 161 lbs/year (25% of target) and 642 lbs/year (100% of target) by the end of Permit Years 10 and 20, respectively. However, if there were a new, compelling reason to extend the PCP to the entire watershed (e.g., substantial private development or US Census dramatically expands the Urbanized Area in the future), the PCP scope could be updated in a later phase of planning. In addition, we recommend that non-structural controls (e.g., sweeping, catch basin cleaning) continue to be completed within the entire watershed and new development and redevelopment within the entire watershed area should meet TMDL goals for phosphorus reduction.

4. Quantifying Phosphorus Load Increases and Reduction Since 2005

By July 1, 2023, EPA requires permittees to submit additional information with their annual report related to the PCP, including, *phosphorus load decreased and increases incurred since 2005 calculated consistently with the procedures in Attachment 1 to Appendix F of the permit.*

Tighe & Bond worked with Town staff to begin to quantify the phosphorus load changes since 2005. Our initial intent was to help the Town take credit for stormwater improvements and to estimate the phosphorous load reduction achieved by installation of municipal and private stormwater BMPs. However, the Town must also consider the net impact of new development and redevelopment projects on phosphorous load. Tighe & Bond compiled information made available by Town staff and Town records, along with work completed by other entities that is publicly available, to identify development and redevelopment projects and understand the types and locations of structural BMPs and the associated impact on total phosphorus load. Using the Assessor's database, we identified 61 parcels throughout Charles River watershed where the year built was 2005 or after, as shown in Figure 3 and Table 4.

- The majority of these parcels are residential single-family homes and therefore do not likely have any stormwater BMPs. These parcels are **shaded grey** on Table 4.
- One large site, the Dunkin Donuts New England Distribution Center warehouse at 150 Depot Street, is not within the Urbanized Area. The industrial site at 140 Depot Street is approximately 50% within the Urbanized Area. There were two condo projects at Old Bridge Lane and Maplebrook Road that are within the Urbanized Area but only a small portion of the entire parcel is within the Charles River watershed. It may be worth reviewing these larger sites to confirm location of stormwater discharges and whether structural BMPs were installed within the watershed. These sites are noted on Figure 3 and **shaded orange** on Table 4.
- There are a few commercial/industrial parcels that have been developed since 2005, and therefore may have stormwater BMPs onsite. These parcels are **shaded yellow** in Table 4.

MEDWAY

MILFORD

HOPEDALE

MENDON

FRANKLIN

BLACKSTONE

CHARLES

STONE STREET
COOK AVENUE
FARM STREET
CHASE STREET
PEARL STREET
STANDISH ROAD
APACHE ROAD
PLYMOUTH ROAD
HARTFORD AVENUE
JOHN ALDEN CIRCLE
RAY AVENUE
BAINBRIDGE ROAD
BRITTANY ROAD
INTERSTATE 495
VALLEY VIEW ROAD
PHILLIP DRIVE
MELLEN STREET
HIXON STREET
ARROWHEAD ROAD
CEDAR HILL ROAD
DEERFIELD LANE
JOYCE LANE
GROVE STREET
NASON STREET
KATHY DRIVE
MONIQUE DRIVE
NORTH MAIN STREET
WETHERSFIELD ROAD
JEANNINE ROAD
YVONNE ROAD
SHIRLEY ROAD
TEMI ROAD
MAPLE STREET
PATRICIA DRIVE
DONNA ROAD
CLARENCE ROAD
CAROLINE DRIVE
ANNMARIE DRIVE
SHEILA DRIVE
TAUNTON STREET
DEPOT STREET
BOX POND DRIVE
HIGH STREET
PONY COURT
FIFTH AVENUE
THIRD AVENUE
JUDY LANE
RUSSEN ROAD
ROSE AVENUE
TONI DRIVE
THAYER ROAD
WOODSIDE LANE
EDGEHILL LANE
MILL STREET
MENDON STREET
COUNTRY SIDE ROAD
DAVID ROAD
MECHANIC STREET
CRYSTAL WAY
POTTER DRIVE
HERITAGE WAY
OLD BRIDGE LANE
SAND CASTLE LANE
NORTH STREET
LYNN COURT
LINDA WAY
STEVEN ROAD
EASY STREET
BRION ROAD

2-1 2-2 2-3 2-4
4-1 4-2 4-3
5-1 5-2
11-1
12-1 12-2
13-1 13-2
15-1 15-2
16-1
17-2 17-3

LEGEND

- Building Constructed Since 2005
- Water Quality Structure (BMPs)
- Stream, Brook

Roads
CLASS
- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road

- Town Boundary
- Urban Area (2000)
- Urban Area (2010)
- Major Drainage Basin
- Lake, Pond, River or Impoundment
- Inland Wetlands
- Town-owned Parcels

1:21,000
0 875 1,750
Feet
N

Tighe&Bond
Engineers | Environmental Specialists

Figure 3
Charles River Watershed
Property Assessment

Bellingham, Massachusetts

May 2018

G:\GIS\MA\BellinghamMA\avproj\BMP_landuseEvaluation11x17.mxd

F-0094

TABLE 4

Parcels Developed Since 2005 in Bellingham

MAP_PAR_ID	BLDG_VAL	LAND_VAL	OTHER_VAL	TOTAL_VAL	LOT_SIZE	USE_CODE	SITE_ADDR	LOCATION	ZONING	YEAR_BUILT	BLD_AREA	UNITS	RES_AREA	STYLE
0052-0005-0000	$ 920,000	$ 386,400	$ 42,200	$ 1,348,600	0.8	341	2 SOUTH MAPLE ST		BUS1	2008	6882	4	6882	BANK
0029-0136-0000	$ 224,800	$ 113,600	$ 13,400	$ 351,800	0.47	101	250 SHIRLEY RD		RES	2010	2648	1	2648	CAPE
0035-0003-0000	$ 192,300	$ 97,900	$ -	$ 290,200	0.61	101	114 NORTH MAIN ST		RES	2011	2214	1	2214	CAPE
0043-0025-0000	$ 252,700	$ 117,600	$ -	$ 370,300	0.24	101	69 BOX POND DR		AGR	2009	2782	1	2782	CAPE
0004-0047-0001	$ 171,600	$ 114,100	$ -	$ 285,700	2.44	101	489 HARTFORD AV		RES	2010	1344	1	1344	CAPE
0018-028+-0001	$ 120,900	$ 136,400	$ -	$ 257,300	1.17	130	3 SHARPE DR		RES	2012	1899	1	1899	CAPE
0009-0029-0000	$ 206,300	$ 102,100	$ -	$ 308,400	1.04	101	401 HARTFORD AV		SUBN	2005	2094	1	2094	COLONIAL
0009-0029-0001	$ 331,300	$ 119,000	$ -	$ 450,300	3.01	101	403 HARTFORD AV		SUBN	2006	2634	1	2634	COLONIAL
0051-0009-0003	$ 300,500	$ 147,700	$ -	$ 448,200	1.34	101	17 ROLLING HILLS DR		SUBN	2005	4320	1	4320	COLONIAL
0051-0009-0001	$ 308,100	$ 144,500	$ 1,100	$ 453,700	0.95	101	9 ROLLING HILLS DR		SUBN	2005	3997	1	3997	COLONIAL
0051-0009-0002	$ 334,000	$ 157,500	$ 1,700	$ 493,200	2.49	101	13 ROLLING HILLS DR		SUBN	2005	4470	1	4470	COLONIAL
0004-0027-0000	$ 231,300	$ 112,500	$ -	$ 343,800	0.28	101	7 STONE ST		RES	2009	2537	1	2537	COLONIAL
0018-0089-0000	$ 206,700	$ 90,800	$ -	$ 297,500	0.45	101	30 DEERFIELD LN		RES	2005	2234	1	2234	COLONIAL
0023-0075-0000	$ 204,900	$ 96,600	$ 1,400	$ 302,900	0.49	101	87 HARTFORD AV		RES	2007	2473	1	2473	COLONIAL
0018-028+-0000	$ 202,500	$ 135,100	$ -	$ 337,600	1.02	101	1 SHARPE DR		RES	2012	1650	1	1650	COLONIAL
0052-005A-0001	$ 251,800	$ 92,100	$ -	$ 343,900	1.06	101	8 SOUTH MAPLE ST			2011	2164	1	2164	COLONIAL
0018-0101-0001	$ 244,800	$ 134,500	$ -	$ 379,300	0.94	101	8 SHARPE DR		RES	2012	1982	1	1982	COLONIAL
0023-0010-0001	$ 238,500	$ 110,600	$ -	$ 349,100	2.03	101	149 HARTFORD AV		RES	2009	3175	1	3175	COLONIAL
0004-046A-0000	$ 204,300	$ -	$ -	$ 204,300	0	102	12 B PEARL ST	B	RES	2008	1250	1	1250	CONDEX
0004-046A-0001	$ 204,300	$ -	$ -	$ 204,300	0	102	12 A PEARL ST	A	RES	2008	1250	1	1250	CONDEX
0051-0001-0001	$ 268,100	$ -	$ -	$ 268,100	0	102	801 OLD BRIDGE LN		AGR	2005	2257	1	2257	CONDO-TNHS
0051-0001-0001	$ 266,300	$ -	$ -	$ 266,300	0	102	802 OLD BRIDGE LN		AGR	2005	2050	1	2050	CONDO-TNHS
0051-0001-0001	$ 264,300	$ -	$ -	$ 264,300	0	102	803 OLD BRIDGE LN		AGR	2005	2050	1	2050	CONDO-TNHS
0051-0001-0001	$ 271,700	$ -	$ -	$ 271,700	0	102	804 OLD BRIDGE LN		AGR	2005	2257	1	2257	CONDO-TNHS
0051-0001-0001	$ 264,300	$ -	$ -	$ 264,300	0	102	901 OLD BRIDGE LN		AGR	2005	2050	1	2050	CONDO-TNHS
0051-0001-0001	$ 281,600	$ -	$ -	$ 281,600	0	102	902 OLD BRIDGE LN		AGR	2005	2711	1	2711	CONDO-TNHS
0051-0001-0001	$ 264,300	$ -	$ -	$ 264,300	0	102	903 OLD BRIDGE LN		AGR	2005	2050	1	2050	CONDO-TNHS
0051-0001-0001	$ 270,400	$ -	$ -	$ 270,400	0	102	904 OLD BRIDGE LN		AGR	2005	2380	1	2380	CONDO-TNHS
0051-0001-0001	$ 246,600	$ -	$ -	$ 246,600	0	102	1001 OLD BRIDGE LN		AGR	2005	1846	1	1846	CONDO-TNHS
0051-0001-0001	$ 247,400	$ -	$ -	$ 247,400	0	102	1002 OLD BRIDGE LN		AGR	2005	1846	1	1846	CONDO-TNHS
0051-0001-0001	$ 247,400	$ -	$ -	$ 247,400	0	102	1003 OLD BRIDGE LN		AGR	2005	1846	1	1846	CONDO-TNHS
0051-0001-0001	$ 247,400	$ -	$ -	$ 247,400	0	102	1004 OLD BRIDGE LN		AGR	2005	1846	1	1846	CONDO-TNHS
0051-0001-0001	$ 263,100	$ -	$ -	$ 263,100	0	102	2901 MAPLE BROOK RD	A	AGR	2007	2039	1	2039	CONDO-TNHS
0051-0001-0001	$ 263,100	$ -	$ -	$ 263,100	0	102	2902 MAPLE BROOK RD	B	AGR	2007	2039	1	2039	CONDO-TNHS
0051-0001-0001	$ 263,100	$ -	$ -	$ 263,100	0	102	2903 MAPLE BROOK RD	C	AGR	2007	2039	1	2039	CONDO-TNHS
0051-0001-0001	$ 265,300	$ -	$ -	$ 265,300	0	102	2904 MAPLE BROOK RD	D	AGR	2007	2039	1	2039	CONDO-TNHS
0051-0001-0001	$ 256,500	$ -	$ -	$ 256,500	0	102	3001 MAPLE BROOK RD	A	AGR	2005	2046	1	2046	CONDO-TNHS
0051-0001-0001	$ 263,500	$ -	$ -	$ 263,500	0	102	3002 MAPLE BROOK RD	B	AGR	2005	2047	1	2047	CONDO-TNHS
0051-0001-0001	$ 260,700	$ -	$ -	$ 260,700	0	102	3003 MAPLE BROOK RD	C	AGR	2005	2045	2	2045	CONDO-TNHS
0051-0001-0001	$ 260,400	$ -	$ -	$ 260,400	0	102	3004 MAPLE BROOK RD	D	AGR	2005	2039	1	2039	CONDO-TNHS
0051-0001-0001	$ 270,700	$ -	$ -	$ 270,700	0	102	3101 MAPLE BROOK RD	A	AGR	2005	2461	1	2461	CONDO-TNHS
0051-0001-0001	$ 265,100	$ -	$ -	$ 265,100	0	102	3102 MAPLE BROOK RD	B	AGR	2005	2049	1	2049	CONDO-TNHS
0051-0001-0001	$ 261,200	$ -	$ -	$ 261,200	0	102	3103 MAPLE BROOK RD	C	AGR	2005	2053	1	2053	CONDO-TNHS
0051-0001-0001	$ 263,400	$ -	$ -	$ 263,400	0	102	3104 MAPLE BROOK RD	D	AGR	2005	2053	1	2053	CONDO-TNHS

TABLE 4

Parcels Developed Since 2005 in Bellingham

MAP_PAR_ID	BLDG_VAL	LAND_VAL	OTHER_VAL	TOTAL_VAL	LOT_SIZE	USE_CODE	SITE_ADDR	LOCATION	ZONING	YEAR_BUILT	BLD_AREA	UNITS	RES_AREA	STYLE
0051-0001-0001	$ 259,100	$ -	$ -	$ 259,100	0	102	3601 MAPLE BROOK RD	A	AGR	2007	1990	1	1990	CONDO-TNHS
0051-0001-0001	$ 266,000	$ -	$ -	$ 266,000	0	102	3602 MAPLE BROOK RD	B	AGR	2007	2008	1	2008	CONDO-TNHS
0051-0001-0001	$ 266,000	$ -	$ -	$ 266,000	0	102	3603 MAPLE BROOK RD	C	AGR	2007	2008	1	2008	CONDO-TNHS
0051-0001-0001	$ 259,100	$ -	$ -	$ 259,100	0	102	3701 MAPLE BROOK RD	A	AGR	2007	1990	1	1990	CONDO-TNHS
0051-0001-0001	$ 266,200	$ -	$ -	$ 266,200	0	102	3702 MAPLE BROOK RD	B	AGR	2007	2008	1	2008	CONDO-TNHS
0051-0001-0001	$ 266,000	$ -	$ -	$ 266,000	0	102	3703 MAPLE BROOK RD	C	AGR	2007	2008	1	2008	CONDO-TNHS
0019-001B-0000	$ 609,200	$ 482,500	$ 265,400	$ 1,357,100	7.87	333	300 HARTFORD AV		IND	2008	4000	1	4000	CONVEN MKT
0052-0001-0000	$ 965,900	$ 539,100	$ 352,700	$ 1,857,700	2.44	333	207 MECHANIC ST		IND	2007	7680	4	7680	CONVEN MKT
0013-0010-2A-2	$ 210,700	$ 149,400	$ -	$ 360,100	3.65	101	36 BEECHWOOD RD		AGR	2008	1848	1	1848	RANCH
0035-0076-0000	$ 278,600	$ 102,100	$ 13,600	$ 394,300	1.04	101	139 NORTH MAIN ST		SUBN	2006	3068	1	3068	RANCH
0044-0082-0000	$ 475,700	$ 288,000	$ 36,700	$ 800,400	2.1	332	46 NORTH MAIN ST		BUS1	2007	10760	1	10760	REPAIR GAR
0052-005A-0000	$ 570,400	$ 265,500	$ 34,100	$ 870,000	1.63	351	6 SOUTH MAPLE ST		BUS1	2006	8072	1	8072	SCH/DAYCAR
0051-001A-0001	$ 2,527,900	$ 387,800	$ 198,500	$ 3,114,200	4.18	323	191 MECHANIC ST		IND	2008	29000	12	29000	SHOP CTR
0045-0050-0001	$ 1,755,100	$ 511,100	$ 74,500	$ 2,340,700	1.94	322	20 MECHANIC ST			2006	14730	1	14730	STORE
0038-0023-0001	$ 16,307,900	$ 2,165,700	$ 237,200	$ 18,710,800	35.01	401	150 DEPOT ST		IND	2005	231817	1	231817	WAREHOUSE
0051-0016-0000	$ 11,078,500	$ 1,604,100	$ 241,100	$ 12,923,700	18.96	401	190 MECHANIC ST		IND	2005	208826	3	208826	WAREHOUSE
0038-0023-0002	$ 12,353,300	$ 2,130,600	$ 371,000	$ 14,854,900	33.82	401	140 DEPOT ST		IND	2008	238975	1	238975	WAREHOUSE

Discussions with Town staff indicated that gathering the building permits, Conservation Commission Order of Conditions, site plan review documents, and other local permit applications and decisions would be a significant effort given the Town's current staffing level, work level, and filing system. Staff also clarified that there had not been a reduction of impervious surface or significant construction of stormwater BMPs on these sites. Although there are 15 stormwater BMPs under the control of the Town that have been constructed within the watershed since 2005, these BMPs are not likely sufficient to offset the increased phosphorus loading from the increased imperviousness in the watershed. These BMPs do not likely manage the total increased impervious area and, based on the inventory included in GIS, these BMPs are all detention basins or plunge pools, which have a low credit for total phosphorus removal compared to infiltration type BMPs.

Therefore, based on our discussions with Town staff and review of mapping, we have assumed that the total phosphorus load in Bellingham within the Charles River watershed has likely *increased,* not decreased, since 2005. **As of the date of this letter report we are assuming that Bellingham must, at a minimum, reduce the total phosphorus load cited in EPA's permit.** Assuming the load is reduced only within the Urbanized Area as discussed in Section 3, Bellingham must remove 161 lbs/year of total phosphorus by Permit Year 10 (2028) through structural and non-structural controls.

The Town will be required to estimate of total phosphorus load change due to development and redevelopment closer to the Small MS4 General Permit deadline in 2023 using GIS data related to land use and impervious cover from the Commonwealth of Massachusetts and the Town. We recommend the Town continue to gather records for projects within the Charles River watershed to track changes in land use and impervious cover as well as identify structural BMP types and locations and to quantify the total phosphorus load reduction achieved by these BMPs using EPA's required calculations. This effort will be coupled with the EPA's mapping requirements for Bellingham to locate public and private structural stormwater BMPs.

5. Recommendations to Achieve PCP Phase 1 Reduction Goal

2011 Sustainable Stormwater Funding Evaluation

EPA Region 1 commissioned a study completed by Horsley Witten that resulted in the 2011 report titled *Sustainable Stormwater Funding Evaluation for the Upper Charles River Communities of Bellingham, Franklin, and Milford, MA* ("2011 Funding Evaluation"). This study evaluated the costs associated with meeting the phosphorus reductions established in the TMDL for the Upper Charles River, as well as meeting requirements of the 2010 draft Small MS4 permit and the draft Residual Designation Authority permit for Bellingham, Franklin, and Milford. This report presents the results of the study including implementation alternatives, cost estimates for operations and structural BMPs, governance and administration options, funding options, billing options, and recommendations for next steps

Since the publication of the 2011 Funding Evaluation, there have been two important changes that impact the findings presented in this report:

1. A final 2016 Small MS4 permit was issued with new phosphorus reduction requirements. At the time the 2011 Funding Evaluation was written, EPA's 2010 draft Small MS4 permit had a target phosphorus load reduction of 51.8% for Bellingham. The 2016 final Small MS4 permit includes a phosphorus load reduction goal of around 35% for Bellingham. The Commonwealth of Massachusetts has since restricted the use of fertilizers containing phosphorus on all non-agricultural turf and lawns (330 CMR

31.00). The reduced phosphorus removal target in the 2016 permit reflects a credit for this state-wide ban in phosphorus fertilizers.

2. The Residual Designation Authority permit (RDA permit) is currently on hold without an expected release date. The RDA permit called for individual Designated Discharges (DDs) located in Bellingham, Franklin and Milford to reduce their total phosphorus loads by 65% from existing conditions. DDs include sites with two or more acres of impervious surface. There are 40 DDs in Bellingham. This permit put the burden of a portion of the Town's total phosphorus reduction on specific existing properties and private development/redevelopment, which would have helped the Town achieve the total phosphorus load reduction but also would have had significant impacts on the local economy and businesses.

Current Stormwater Program Costs

Section 4 of the 2011 Funding Evaluation presents cost estimates for existing stormwater services to address the 2003 Small MS4 General Permit, as well as the projected cost of future services to address the 2010 draft Small MS4 and RDA general permit. Costs for the existing program included expenditures related to the administration and implementation of the 2003 stormwater program. Future costs assume adding new services to the existing program as necessary to fulfill conditions of the draft 2010 Small MS4 General Permit and to meet phosphorus load reductions. Future services are divided into operational costs (running the program) and capital expenditures (retrofitting with structural practices for phosphorus reductions).

The 2011 Funding Evaluation's presentation of existing operational costs for administration, regulation/enforcement, engineering & master planning, operation & maintenance, and monitoring was comprehensive. The report assumed Bellingham was spending approximately $235,000 (2010$) annually to address the 2003 permit.

Future Stormwater Program Costs

Future stormwater costs built on the 2010 existing costs to include new services required by the draft Small MS4 permit and the optional provisions for municipal involvement in RDA general permit. **The 2011 Funding Evaluation estimated the annual operational cost estimates for Bellingham's municipal stormwater program would range from $799,000 to $1,029,000 annually.** These costs represented a significant increase over the estimated current annual stormwater expenditures. Figure 4, below, shows the Operational Costs for Bellingham's program as presented in the 2011 Funding Evaluation.

Cost Center	Existing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10
Administration	$18,421	$69,373	$48,185	$34,343	$56,558	$54,785	$61,984
Regulation/ Enforcement	$1,800	$3,750	$13,500	$13,500	$13,500	$24,375	$27,578
Engineering & Master Planning	$17,000	$311,007	$419,892	$259,470	$179,245	$171,275	$193,782
Operations & Implementation	$194,918	$470,028	$469,028	$493,313	$471,528	$550,736	$623,107
Monitoring	$0	$17,650	$77,975	$77,975	$77,975	$77,975	$88,222
Total	**$232,139**	**$871,807**	**$1,028,579**	**$878,601**	**$798,806**	**$879,145**	**$994,672**

FIGURE 4: Operational Costs for Bellingham's Stormwater Program from 2011 Funding Evaluation

Future programmatic costs appear to overestimate the total obligation for compliance based on the 2016 Small MS4 General Permit for the following reasons:

- Based on review of Table 4.9, Cost Assumptions and Implementation Timeframe for New and Enhanced Services, Horsley Witten assumed a level of service that is

significantly beyond minimum compliance with requirements of the Small MS4 General Permit without buy-in from Bellingham's decision makers, residents, and stakeholders.

- In our March 7, 2017, letter, Tighe & Bond provided the Town with an Opinion of Probable Costs based on the 2016 Final MA General Permit Requirements for Permit Years 1 through 5, which estimated that Bellingham can expect to spend approximately $100,000 per year (2016$) to comply with the new Small MS4 permit. These costs did not include drainage system maintenance (e.g., operations and implementation such as street sweeping and catch basin cleaning) or correction of illicit discharges and connections. However, the DPW included a more comprehensive Permit Year 1 or Fiscal Year 2019 program budget of $522,600 in the April 2018 Annual Report to EPA. This is nearly $350,000 less (about 40% less) than the Year 1 estimate in Figure 4.
- Future costs in the 2011 Funding Evaluation also reflect a permit requirement that no longer is included in the final 2016 Small MS4 General Permit (i.e., tracking impervious cover) and reflect developing and implementing a Certified Municipal Phosphorus Program (CMPP), which would not be required without the RDA general permit.
- In addition, the actual costs could be lower if the Town elects to use in-house staff, volunteers, or college interns to complete some or all of the monitoring, data gathering, and reporting requirements.

The 2011 Funding Evaluation also presented estimated capital costs associated with reducing the load by 36.8% (corresponding to a total phosphorus load of 784 lbs/year[2]) with structural BMPs, which is estimated to be $29.7 Million for Bellingham. This equals an approximate cost of $38,000 per pound of reduction in annual phosphorus load. The 2011 Funding Evaluation used a theoretical approach to estimate and compare the potential capital costs to comply with the total phosphorus reduction targets specified in the TMDL, including: 1) scaling-up of costs from a recently completed watershed plan for the Spruce Pond Brook in Franklin, MA; 2) the application of results from a GIS-based spreadsheet model to size and budget for hypothetical, structural BMPs as a function of watershed land cover and treatment volume; and 3) a comparison of stormwater retrofit implementation costs per impervious acre treated from a number of other studies from New England and the Mid- Atlantic.

Ultimately the Evaluation concluded "there is a fairly significant range of costs for implementation of structural controls to achieve phosphorus reductions depending on land use intensity, specific site constraints, control objective, and which method or implementation option one chooses to focus on. One difficulty is that currently there is not a watershed management plan for the upper Charles River watershed that specifies where controls would be most cost effective and where these control measures might be located. The scaled-up assessment from Spruce Pond Brook likely provides the best possible estimate at this time. A careful look at the unit costs compared against the implementation costs from other studies and projects supports this conclusion. In addition, the scaled-up assessment from Spruce Pond Brook accounts for land acquisition costs."

2011 Subwatershed Management Plan

In 2011 Bellingham was awarded a 604b grant from the Massachusetts Department of Environmental Protection. The Charles River Watershed Association (CRWA) along with Nitsch

[2] Note that the 2011 Funding Evaluation cited an existing total phosphorus load of 2,132 lbs/year and a TMDL allowable load of 1,028 lbs/year, with a required load reduction of 1,104 lbs/year for Bellingham. These numbers differ from EPA's final 2016 MS4 General Permit, and the 2016numbers presented in Table 2 are more advantageous to Bellingham.

Engineering worked with the Town to produce a Subwatershed Management Plan for the Town Center area of Bellingham using this grant funding. As part of this Plan, a watershed-based modeling approach was completed for a 0.37 square mile study area (located just to the south and west of Route 495, with Routes 140 and 126 at its center) with 29 drainage areas. Iterative modeling completed identified an *optimal scenario* which was both lowest cost and achieved the goal of collectively removing 41% of the total phosphorus load in the Subwatershed Management Plan study area for a total theoretical price of $212,540.

The study ultimately defined six priority sites and presented conceptual designs for ten structural BMPs (infiltration basins, rain gardens, infiltration trenches, and bioretention system) on these sites with revised estimated costs and expected removal of total phosphorus.

Table 5 lists the six sites, the BMPs designed, the existing phosphorus load, the targeted removal load, design parameters, and the estimated construction cost presented in the proposed design section of the report. The drainage areas for these six sites are contributing 66.18 lbs/year of phosphorus to the Charles River watershed. Using information from Appendix A and the proposed design section of the report, we compiled the ten recommended BMPs as designed, which are estimated to remove 39.78 lbs/year of total phosphorus, slightly less than the modeled 41% for the entire subwatershed. Using information provided for each of the proposed designs included, we total the final estimated construction cost for these six sites is $228,020, slightly more than the theoretical price of $212,540 from the modeling. This results in a unit cost of $5,730 per lb/year or $2,830 per acre of total drainage area or $7,400 per impervious acre. All costs are in 2011 dollars.

TABLE 5

BMP Design Summary from 2011 Subwatershed Management Plan

BMP ID	BMP Location Name	Drainage Area (ac)	Impervious Area (ac)	Land use	Hydrologic Soil Group	Existing Phosphorus Load (lbs/yr)	Estimated Infiltration Rate (in/hr)	Target Phosphorus Removal	Phosphorus Load Reduction (lb/yr)	Water Quality Depth (in)	Water Quality Volume (ft3)	Stormwater Control Surface area (ft2)	Estimated Construction Cost
DD1-A&B	*Bellingham Plaza*	*7.6*	*5.7*	*Commercial*	*A*	*13.2*							
	Infiltration Trenches	1.6	1.6			3.86	4.46	50.90%	1.96	0.24	1400	2250	$7,700
	Rain Gardens	4.5	4.5			9.28	4.46	50.90%	4.72	0.38	6214	8990	$100,300
O6	*Toni and Jamie cul-de-sac*	*4.9*	*1.2*	*Low Density Residential*	*B*	*1.5*							
	Infiltration Basin	4.92	1.15			1.5	0.61	85.10%	1.28	0.61	2670	7170	$14,870
O24 & O24A	*Municipal Building Parking Lot*	*0.7*	*0.7*	*Commercial*	*A*	*0.6*							
	Infiltration Trench	0.68	0.68			0.1	4.46	79.50%	0.08	0.48	1130	820	$7,480
	Rain Gardens	0.11	0.11			0.62	4.46	85.70%	0.53	0.7	280	420	$1,670
O28	*Town Hall/Parking Lot*	*3*	*2.2*	*Commercial*	*A*	*4.37*							
	Infiltration Basin	2.98	2.19			4.37	4.46	85.70%	3.75	0.48	3710	2680	$12,100
S4	*Thayer St. Creek Central*	*27*	*5.6*	*Medium Density Residential*	*B*	*11.1*							
	Infiltration Basin	26.97	5.57			11.1	0.73	64.30%	7.14	0.28	5490	3350	$14,800
O18	*Town Commons*	*37.4*	*15.43*	*Commercial*	*A/C*	*35.41*							
O18A	Infiltration Basin	23.51	9.49			21.33	0.73	73.50%	15.68	0.36	12450	7960	$23,700
O18B	Rain Garden	6.52	2.34			6.31	0.73	58.10%	3.67	0.23	2000	3840	$25,400
O18C	Bioretention System	4.49	1.45			2.89	0.21	34.00%	0.98	0.2	1090	1410	$20,000
TOTAL		**80.6**	**30.83**			**66.18**			**39.78**				**$ 228,020.00**

Tighe & Bond evaluated the expected phosphorus removal and costs of the proposed BMPs presented in the 2011 Subwatershed Management Plan to understand:

1. **How much of the Phase 1 (161 lb/year) Phosphorus Load Reduction Requirement will these BMPs achieve given the phosphorus removal calculation methodology included in the Small MS4 General Permit?**
2. **How cost-effective are these BMPs?**

To answer the question about how much of the Phase 1 load reduction requirement these ten BMPs will address, we first re-calculated the expected phosphorus removal of each BMP using the methods provided in the 2016 Small MS4 General Permit Attachment 3 to Appendix F.

- Phosphorus loads to each of the conceptual BMPs were calculated using the Phosphorus Load Export Rate for Commercial/Industrial Impervious Area in Table 3-1 of Attachment 3 of Appendix F of the permit, and the drainage area of the conceptual BMPs as identified in the 2011 Subwatershed Management Plan. We completed to version of the analysis: one where we assumed the drainage area was a mix of impervious and pervious surface, and one were we assumed the entire drainage area was impervious, as the Plan was not clear about the exact treatment areas. For all calculations we assumed the land use was equivalent to Commercial/Industrial as the BMPs were all located close to Town Center, the most densely developed area of Bellingham.
- The expected phosphorus removal for each BMP was calculated using the BMP performance curves in Attachment 3 of Appendix F for each type of BMP and varying soil infiltration rates. Soil infiltration rates for individual BMPs were assumed to be as shown in the 2011 Subwatershed Management Plan. Using the curves for given infiltration rate, an "interpolation adjustment factor" (IAF) was determined to interpolate between infiltration rates for the performance curves given in the permit to the infiltration rate at the proposed BMP site.

For these ten BMPs, the 2016 Small MS4 General Permit calculations estimate around 40 lbs/year (up to 45 lbs/year if the treatment area includes both pervious and impervious surfaces) would be removed by these BMPs, which is consistent with the estimate of 39.78 included in the 2011 Subwatershed Management Plan.

Tighe & Bond completed site visits in mid-2017 to the proposed BMPs presented in the plan. Two of the BMPs identified in the 2011 report were determined to not be feasible based on their location: the Rain Garden and the Bioretention Basin at the Town Commons, identified as BMP ID O18-B and O18-C, respectively, in the Subwatershed Management Plan. The Rain Garden (BMP ID 018-B) was noted to be in an area with limited space without clearing trees and other vegetation. Further investigation of the drainage system layout and connectivity is necessary to confirm that this location would actually capture runoff from areas in need of stormwater treatment. The Bioretention Basin (BMP ID 018-C) would require significant clearing of trees and a disturbance of a natural area that already is likely provided infiltration for stormwater runoff and uptake of nutrients by trees and other vegetation. A BMP at this location is not an improvement over existing conditions. Therefore, the total expected annual phosphorus load reduction achieved by the remaining eight of the BMPs is 35.7 lbs/day, or 22% of the ten-year PCP reduction requirement of 161 lbs/year. The remaining BMPs appear to be feasible and, because they are low-cost options that reduce a good portion of the Phase 1 PCP reduction requirement, are cost-effective and should be implemented to reduce total annual phosphorus loading.

To answer the question about how cost-effective these BMPs are, we reviewed and updated the costs presented in the 2011 Subwatershed Management Plan as follows:

- The 2011 costs were cited as construction cost. We assume these costs do not include survey, design, permitting, or any contingency.
- We reviewed the cost estimates based on BMP size and increased the 2011 construction costs based on best professional judgement.
- Tighe & Bond utilized the Engineering News Record construction cost index to scale the costs from 2011 to 2017 dollars. We added a 40% project contingency, a 20% Material and Bidding Contingency, and applied a cost of 10% for engineering and design, 5% contingency for permits, and 2% for survey, to each BMP.

Phosphorus removal loads for the BMPs as well as the 2011 construction cost and Tighe & Bond's planning level opinions of cost[3] are included in Table 6.

With a Phase 1 PCP Phosphorus Reduction target of 161 lbs/year for the Urbanized Area of Bellingham within the Charles River watershed, the BMPs listed in Table 6 would correspond to approximately 22% of the total reduction needed for Bellingham by Permit Year 10 at a construction cost of just under $410,000 ($11,500 per lb/year).

Extrapolating those costs, as a best-case scenario the Town could expect to spend approximately $1.865 Million to achieve the Permit Year 10 (Phase 1) PCP reduction requirement of 161 lbs/year, and could expect to spend $7.5 Million to achieve the total load reduction of 642 lbs/year (note that this does not include any non-structural BMPs, which are discussed in the next section of this letter report). It is important to remember that these costs are for lower unit-price BMPs (e.g., infiltration trench, infiltration basin, rain gardens) that are on land already owned by the Town. This also assumes that land is available and does not require purchase or obtaining an easement. Costs will also increase as it becomes more technically difficult to complete retrofits over the 20-year planning period.

Actual costs for structural BMPs will vary depending on type of BMP, land ownership, material and labor costs at the time of construction, and therefore Bellingham can expect to spend somewhere between the costs extrapolated by the 2011 Subwatershed Study ($7.5 Million) and the 2011 Funding Feasibility study ($29.7 Million).

For planning purposes, Bellingham should budget a minimum of $200,000 annually to installing BMP retrofits during the first ten permit years, with a goal of removing approximately 16 lbs/year of total phosphorus.

[3] Tighe & Bond has no control over the cost or availability of labor, equipment or materials, or over market conditions or the Contractor's method of pricing, and that the estimates of probable construction costs are made on the basis of the Tighe & Bond's professional judgment and experience. Tighe & Bond makes no guarantee nor warranty, expressed or implied, that the bids or the negotiated cost of the Work will not vary from this estimate of the Probable Construction Cost

TABLE 6

Subwatershed Management Plan BMP Costs and Total Phosphorus Load Removal – 2017 Update

BMP ID	BMP Location and Type	Updated Expected Phosphorus Load Removal[1] (lbs/year)	2011 Construction Cost from Subwatershed Management Plan	2017 Planning Level Opinion of Cost [2]	Updated Cost per Pound of Phosphorus Removed ($/lb P)
DD1-A&B	***Bellingham Plaza***				
	Infiltration Trenches	2.05	$7,700	$17,000	$8,300
	Rain Gardens	7.09	$100,300	$223,500	$31,500
O6	***Toni and Jamie cul-de-sac***				
	Infiltration Basin	1.54	$14,870	$33,000	$21,500
O24	***Municipal Building Parking Lot***				
	Infiltration Trench	1.09	$7,480	$16,500	$15,200
	Rain Gardens	0.19	$1,670	$4,700	$24,800
O28	***Town Hall/Parking Lot***				
	Infiltration Basins	3.65	$12,100	$27,000	$7,400
S4	***Thayer St. Creek Central***				
	Infiltration Basin	7.69	$14,800	$33,000	$4,300
O18	***Town Commons [2]***				
	Infiltration Basin	12.38	$23,700	$53,000	$4,300
TOTAL		**35.7**	**$182,620**	**$407,700**	**$11,500**

Notes:

1 Phosphorus Load and Removals calculated using Attachment 3 of Appendix F of the 2016 Small MS4 Permit2 Per Section 3, this includes a 40% project contingency, a 20% Material and Bidding Contingency, and applied a cost of 10% for engineering and design, 5% contingency for permits, and 2% for survey, to each BMP.

2 As noted in Section 3, the Town Commons Rain Garden and Bioretention System were determined to be infeasible.

Consideration of Available Land for Retrofits

As part of this letter report, we briefly discussed the Designed Discharge sites identified under the RDA General Permit (i.e., sites in Bellingham with two or more acres of impervious surface) that would have been required to reduce total phosphorus loads from their site by 65%. These sites provide a total of 281.3 acres of impervious area in the Charles River watershed in Bellingham.

It is reasonable to wonder whether or not the Town could achieve the Phase 1 PCP Load Reduction (161 lb/year) on municipal land only. Appendix A of the 2011 Subwatershed Study provided calculations that allowed us to estimate annual pounds of phosphorus removed per impervious area by each BMP. Based on the data in that report, 0.04 to 2.06 lbs/year per acre of impervious area can be reduced, with an average of around 1.15 lbs/year per acre impervious area.

Using GIS that shows Town-owned parcels from the Town's assessor's database and impervious cover from MassGIS, we calculated there is approximately 38.5 acres of impervious surface on municipal parcels in the Charles River watershed. This includes parking and roadways on each site, but does not include streets throughout the watershed. Assuming 100% of this impervious area could be addressed by structural BMPs, the Town would only be able to remove approximately 43 lbs/year of total phosphorus, or about 27% of the Phase 1 PCP Reduction Requirement. **Given these ballpark calculations, the Town of Bellingham will not likely be able to achieve the total Phase 1 PCP Reduction without the help from private parcels or without significant roadway retrofits.**

Consideration of Non-structural Controls

EPA has clarified that non-structural controls are possible mechanisms for the reduction of phosphorus. Since the permit has been issued as a draft, EPA staff have repeatedly stated that 15% of the total load reduction could be achieved with non-structural controls. Both studies reviewed in this letter report also assumed a total of a 15% reduction from non-structural controls:

- The 2011 Sustainable Stormwater Funding Evaluation assumed a 15% reduction of the total load obligation could be achieved through non-structural controls, including:
    - 2% reduction from enhanced street sweeping,
    - 2% reduction from semi-annual catch basin cleaning,
    - 1% reduction from collection of organic wastes and leaf litter; and
    - 10% reduction from a ban on phosphorus in fertilizers.
- The 2011 Subwatershed Management Plan for Bellingham assumed that a reduction of 15% could be achieved through non-structural stormwater management practices such as street sweeping, catch basin cleaning, leaf litter collection and composting, or discontinuing the use of fertilizers that contain phosphorus.

These studies were completed before the phosphorus-containing fertilizer statewide ban and therefore EPA's revised phosphorus reduction target in the 2016 Small MS4 General Permit accounts for the 10% reduction. Based on this, we assume that 5% of the total phosphorus load can be achieved from non-structural controls. For Bellingham, that equates to approximately 1/7 of the total 36% load reduction required.

To understand the cost-benefit of a load reduction from non-structural controls, Tighe & Bond preliminarily evaluated the three nonstructural controls for which the Town may claim phosphorus reduction credit per the 2016 Small MS4 permit:

- Enhanced Street Sweeping Program (credits depend on type of sweeper and frequency)
- Catch Basin Cleaning
- Organic Waste and Leaf Litter Collection Program

Our assessment of potential phosphorus reduction credit based on Attachment 2 to Appendix F of the 2016 permit. EPA and planning studies have been broadly applying a percent load reduction to the total load within the Charles River watershed, however, the methodology presented in Attachment 2 to Appendix F require calculations that consider exact area managed and land use. For example, monthly sweeping with a mechanical broom does not reduce the phosphorus load by 3%, but instead reduces the load from only impervious areas that are swept by 3%. The load that is being addressed is calculated based on the land use in the area of sweeping. Our assumption is that the total reduction that can be achieved by implementing non-structural controls may be overstated. This portion of the letter report explores that assumption.

As part of our assessment, we completed preliminary calculations and found the following:

- Roadways and municipal parking lots within the Charles River watershed portion of Bellingham account for approximately 950 lbs/year of the total phosphorus load (45% of the 2,088 lb/year total load from the watershed as previously shown in Table 2). Sweeping has the potential to remove between 9.5 to 95 lbs/year of total phosphorus. This ten-fold difference is due to the method and frequency of sweeping. For example, 9.5 lbs/year is associated with a 2x/year mechanical broom sweeping program. 95 lbs/year is associated with a weekly high efficiency regenerative air vacuum sweeping program. For monthly sweeping (12x/year) with a mechanical broom, we estimate 28.6 lbs/year of total phosphorus can be reduced, or just under 18% of the 161 lb/year Phase 1 PCP Reduction Requirement. If sweeping with a mechanical broom was reduced to 9 months per year, which is more realistic given that winter typically presents sweeping, approximately 21.5 lb/year could be removed or around 13% of the Phase 1 PCP Reduction Requirement. Over 20 years, this would account for 7% annual of the total phosphorus reduction requirement Currently, the Town sweeps all roads twice per year with a mechanical broom sweeper and therefore this non-structural BMP may be feasible with an increase in DPW operating budget and staffing.
- The areas draining to catch basins are estimated to produce an annual phosphorus load of 333 lbs/year. Cleaning the Town's catch basins twice per year would remove just under 7 lbs/year of total phosphorus, or around 4% of the Phase 1 PCP Load Reduction Requirement, but less than 1% of the 20-year requirement. The Town currently cleans catch basins on an "as-needed" basis. On average, the Town of Bellingham cleans each basin once every three years. Increasing to a bi-annual catch basin cleaning program is a significant increase in effort and cost for the Town with minimal benefit to reduce phosphorus.
- We estimate that an advanced organic waste and leaf collection program could remove 47 lbs/year, or just under 30% of the Phase 1 PCP Reduction Requirement. To be eligible for this credit, Bellingham would have to adopt a new program to gather and remove all landscaping wastes, organic debris, and leaf litter from impervious roadways and parking lots at least once per week for the period of September 1 to December 1 each year. The gathering and removal must occur immediately following any landscaping activities in the Watershed and at additional times when necessary to achieve a weekly cleaning frequency. Disposal of the organic waste must not contribute pollutants to surface water discharges. An enhanced sweeping program of weekly frequency can be used to qualify for this credit, provided that the sweeping is

effective at removing leaf litter and organic materials. This is a significant annual load reduction; however, the program cost and effort would also be significant.

Additional evaluation to define cost-benefit is necessary to understand the total life cycle cost per pound of phosphorus removed by each control to compare to structural BMP implementation. Section 4.2.1 of the 2011 Sustainable Stormwater Funding Evaluation presented operations & implementation costs for Bellingham that hovered around $500,000 a year, increasingly slightly as time progresses to account for inflation and increased costs of services. As clarified in Section 4.2.3, these costs include semi-annual street sweeping program of all streets and directly connected municipal parking lots with a regenerative air sweeper (2% reduction), semi-annual catch basin cleaning (2%), and cleanup of organic waste and leaf litter at least seven times during the year, including weekly during the peak periods of leaf drop in the fall (1% reduction). The 2011 Funding Evaluation does not provide detail sufficient to evaluate the cost of each activity compared to the reduction. **Further evaluation is needed to define costs of non-structural BMPs and refine this conclusion.**

6. Conclusions

To address EPA's 2016 Small MS4 General Permit and the TMDL for the watershed, Town of Bellingham must reduce the discharge of total phosphorus from stormwater to the Charles River watershed. While this letter report does not serve as the PCP, it reviewed the PCP requirements along with the effort and order of magnitude cost to complete the first phase of PCP planning and implementation, which is through Permit Year 10 (i.e., June 30, 2028).

In general, it is our opinion that the Phase 1 PCP phosphorus reduction goal will be possible with an investment from the Town over the next ten years. However, the ultimate 20-year phosphorus reduction goal will be technically difficult and very expensive due to limited municipal land area available for retrofits and without wide-spread participation from private property owners by either incentives from the Town (e.g., stormwater utility with a credit system) or a new mandate such as the Charles River RDA permit.

This letter provided information to Bellingham to guide big picture decisions to begin the PCP:

1. Should the PCP be implemented for the whole Town within the Charles River watershed or only for the regulated (Urbanized) area in the watershed?
2. What phosphorus reduction progress is quantifiable since 2005?
3. What, if any, recommendations from previous studies are actually cost-effective and may warrant inclusion in the PCP?

The following summarizes results of our evaluation completed in this letter.

Should the PCP be implemented for the whole Town within the Charles River watershed or only for the regulated (Urbanized) area in the watershed?

Because EPA's Small MS4 General Permit allows communities to decide to address the load from either the community area within the watershed or the load from the Urbanized Area, we considered the two options and determined that Bellingham would be best served by undertaking the PCP within the Urbanized Area only. This determination was based on:

- The load reduction for the Urbanized Area (642 lbs/year) is 88 lbs/year less than the total watershed area (730 lbs/year), which equates to 5 to 15 additional structural BMPs, or an approximate additional cost of $1.01 Million or more (based on $11,500 per lb/year as described in Section 4 of this letter report).

- There is significantly less impervious cover outside of the Urbanized Area and therefore there are fewer opportunities for siting BMPs that provide a cost-effective load reduction.
- There are 61 town-owned parcels within the entire watershed and all but two are within the urbanized area. Municipally-owned parcels are the first place to consider structural BMP installation as they are within the Town's control, further indicating there are more opportunities within the Urbanized Area to install retrofits on Town-owned parcels.

At this time, we recommend Bellingham undertake the PCP within the Urbanized Area only. However, if there was a compelling reason to expand the PCP to cover the entire watershed (e.g., substantial private development, or US Census dramatically expands the Urbanized Area in the future), the PCP extent could be updated in a later phase of planning. In addition, we recommend non-structural controls (e.g., sweeping, catch basin cleaning), continue to be completed within the entire watershed.

What phosphorus reduction progress is quantifiable since 2005?

Based on our discussions with Town staff and review of mapping, we have determined that the total phosphorus load in Bellingham within the Charles River watershed has likely *increased* since 2005. At a minimum, Bellingham must reduce the total phosphorus by 161 lbs/year by Permit Year 10 (2028) through structural and non-structural controls.

Town staff should continue to gather records for development and redevelopment projects within the Charles River watershed to identify structural BMP types and locations and to quantify the total phosphorus load reduction achieved by these BMPs using EPA's required calculations. This effort will be coupled with the permit mapping requirement for Bellingham to locate public and private structural stormwater BMPs.

What, if any, recommendations from previous studies are actually cost-effective and may warrant inclusion in the PCP?

EPA Region 1 commissioned a study completed by Horsley Witten that resulted in the 2011 report titled *Sustainable Stormwater Funding Evaluation for the Upper Charles River Communities of Bellingham, Franklin, and Milford, MA* ("2011 Funding Evaluation"). While their current program costs are reasonable, the future stormwater program costs for both annual operations ($799,000 to $1,029,000) and structural BMPs ($29.7 Million or approximately $38,000 per pound of reduction in annual phosphorus load) likely overestimate the total obligation for compliance based on the 2016 Small MS4 General Permit.

The 2011 Subwatershed Management Plan for Bellingham, funded by a 604b grant from the Massachusetts Department of Environmental Protection, and completed by the Charles River Watershed Association (CRWA) along with Nitsch Engineering, found six sites[4] that receive 66.18 lbs/year of phosphorus loading to the Charles River watershed could be retrofitted by ten BMPs designed to remove 39.78 lbs/year of total phosphorus at an estimated construction cost of $228,000. This results in a unit cost of $5,730 per lb/year or $2,830 per acre of total drainage area or $7,400 per impervious acre. All costs are in 2011 dollars.

Tighe & Bond evaluated the expected phosphorus removal and costs of the proposed BMPs presented in the 2011 Subwatershed Management Plan and found that the total expected annual phosphorus load reduction achieved by eight of the BMPs is 35.7 lbs/day, or 22% of

[4] Note that two of these sites were omitted based on site walk with Town Staff.

the ten-year PCP reduction requirement of 161 lbs/year. These BMP estimates are significantly more cost-effective than the estimates in the 2011 Funding Evaluation, as the average BMP reduction is $11,500 per lb/year (compared to $38,000 per pound). Based on this estimate, Town can expect to spend approximately $1.865 Million to achieve the Permit Year 10 (Phase 1) PCP reduction requirement, and can expect to spend somewhere over $7.5 Million (note that this does not include any non-structural BMPs) to achieve the total load reduction of 642 lbs/year, which is significantly less than the $29.7 Million estimated by Horsley Witten for non-structural BMPs. In reality, the actual cost for structural BMPs is likely somewhere between the two estimates, and the 2011 Subwatershed Management Plan selected simple, cost-effective BMPs, in the most easily retrofitted drainage areas. Retrofitting with other, most costly BMPs, will increase the structural cost, but not likely as high as the estimates in the 2011 Subwatershed Management Plan. Tighe & Bond completed site visits to the proposed BMPs presented in the plan and determined these BMPs are cost-effective and should be implemented to reduce total annual phosphorus loading.

Tighe & Bond preliminarily evaluated the three nonstructural controls for which the Town may claim phosphorus reduction credit per the 2016 Small MS4 Permit to understand the cost-benefit of a load reduction from non-structural controls. We found that even the current level of street sweeping provides a cost-effective credit to Bellingham, and the Town should consider increasing the frequency as this is likely one of the most cost-effective BMPs. Catch basin cleaning and an Organic Waste and Leaf Litter Collection Program will require significant increases in the program and therefore increase in the cost. A full life cycle cost for non-structural BMPs is necessary to understand the cost associated with each pound of total phosphorus reduced by each type of BMP. Further evaluation of costs for structural and non-structural BMPs is necessary to compare the true cost-benefit.

We hope this letter report helps Bellingham begin to address EPA's 2016 Small MS4 General Permit Phosphorus Control Plan requirements. We would be pleased to discuss any portion of this letter report in further detail and look forward to continuing to assist the Town of Bellingham with undertaking a cost-effective stormwater management program.

Very truly yours,

TIGHE & BOND, INC.

Emily Scerbo, P.E.
Stormwater Senior Technical Specialist

Janet Moonan, P.E.
Project Manager

Copy: Denis Fraine, Town Administrator
Jim Kupfer, Town Planner/Zoning Compliance Officer
Tom Mahanna, Tighe & Bond

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Permit Year 2

(July 1, 2019 – June 30, 2020)

Year 2 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2019-June 30, 2020

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2019 and June 30, 2020 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization: Town of Bellingham

EPA NPDES Permit Number: MAR041091

Primary MS4 Program Manager Contact Information

Name: Donald DiMartino Title: DPW Director

Street Address Line 1: 26 Blackstone Street

Street Address Line 2:

City: Bellingham State: MA Zip Code: 02019

Email: DDiMartino@bellinghamma.org Phone Number: (508) 966-5813

Stormwater Management Program (SWMP) Information

SWMP Location (web address): https://www.bellinghamma.org/stormwater

Date SWMP was Last Updated: June 2019

If the SWMP is not available on the web please provide the physical address:

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☒ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☒ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. ***By checking each box you are certifying that you have completed that permit requirement fully.*** *If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Year 2 Requirements

☒ Completed Phase I of system mapping

☒ Developed a written catchment investigation procedure and added the procedure to the SWMP

☒ Developed written procedures to require the submission of as-built drawings and ensure the long term operation and maintenance of completed construction sites and added these procedures to the SWMP

☒ Enclosed or covered storage piles of salt or piles containing salt used for deicing or other purposes

☒ Developed written operations and maintenance procedures for parks and open space, buildings and facilities, and vehicles and equipment and added these procedures to the SWMP

☒ Developed an inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment and added this inventory to the SWMP

☒ Completed a written program for MS4 infrastructure maintenance to reduce the discharge of pollutants

☐ Developed written SWPPPs, included in the SWMP, for all of the following permittee owned or operated facilities: maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above year 2 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

The Town and stormwater consultant performed a SWPPP inspection at the DPW facility on June 19, 2020. See COVID-19 impacts section. Due to the delay in inspection, the SWPPP was prepared in Permit Year 3. Additional evaluation of the Transfer Station was conducted in Permit Year 2 as part of the O&M Plan

development; it was determined that a SWPPP is also needed for this site. This plan will be finalized in Permit Year 3.

Annual Requirements

- ☒ Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements
- ☒ Kept records relating to the permit available for 5 years and made available to the public
- ☒ The SSO inventory has been updated, including the status of mitigation and corrective measures implemented
  - ○ This is not applicable because we do not have sanitary sewer
  - ◉ This is not applicable because we did not find any new SSOs
  - ○ The updated SSO inventory is attached to the email submission
  - ○ The updated SSO inventory can be found at the following website:
- ☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- ☐ Provided training to employees involved in IDDE program within the reporting period
- ☒ All curbed roadways were swept at least once within the reporting period
- ☒ Updated outfall and interconnection inventory and priority ranking as needed

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above annual requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

Due to COVID-19 restrictions, the IDDE Training scheduled for Permit Year 2 had to be redesigned and recorded to be accessed on-demand in small groups without the trainer present. Training did not occur until August 2020 (17 DPW employees were trained).

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- ☒ Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☒ Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- ☒ Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

☒ Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads

☒ Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Charles River Watershed Phosphorus TMDL

☒ Completed Legal Analysis

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

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

New Stormwater Utility. The Selectboard placed an article on the November 13, 2019 Town Meeting Warrant to establish a Stormwater Management Enterprise Fund. The Finance Committee held the public hearing and recommended the article on September 30,2019. The Town meeting voted 116 for and 23 against approving the Stormwater Enterprise Fund. 2. The Selectboard discussed and approved an initial Stormwater fee schedule at their meeting on June 8, 2020. The Stormwater utility budget was approved at the June 22, 2020 Town Meeting. The Selectboard held a public hearing on acceptance of the Stormwater Utility Fee Regulations and revised Stormwater Fee Schedule as part of their meeting August 24, 2020. The first bills are expected to go out in October 2020. More information in this FAQ: https://www.bellinghamma.org/sites/g/files/vyhlif2796/f/uploads/stormwater_utility_handout_final.pdf

Charles River Phosphorus TMDL. During Permit Year 2, Bellingham completed construction of one stormwater best management practice (BMP) retrofit consisting of an infiltration basin and associated pre-treatment (sediment forebay) that manages 0.92 acres of impervious area, along with creation of landscaped park that reduces 0.31 acres of directly connected impervious cover, at the Town's Municipal Center located a

10 Mechanic Street, Bellingham, MA. Removed 1.4 lbs/year of phosphorus and just under 5,000 col/mL of bacteria from leaving the site and entering the Charles River. The work is a high-priority recommendation from work completed under a 604(b) grant prepared by Charles River Watershed Association (CRWA) and Nitsch Engineering as documented in the 2011 report titled “Subwatershed Management Plan for Bellingham, MA”. Previously, stormwater runoff from the Municipal Center parking area discharges without treatment to the Charles River Watershed which results in the discharge of pollutants including nutrients, pathogens, sediments, and metals. Installing the BMP and creating a green space that decreases paved area will reduce the concentrations of pollutants in stormwater runoff, reduce thermal impacts, and reduce peak runoff during small precipitation events. In addition, this project included public education and outreach through an unveiling ceremony and installation of educational signage on site that will provide visitors to the frequently visited municipal center with information on the Town’s stormwater management efforts.

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- (●) Yes
- ( ) No

If yes, describe below, including any relevant impairments or TMDLs:

Bellingham's NOI listed receiving waters based on the water quality limited waters within the Town's urbanized area that were included in the 2014 303(d) List. The Town has evaluated changes to the impairments and/or receiving waters based on the final 2016 303(d) List and enclosed the analysis herein. The enclosed document will be included in the Town's SWMP. Based on this review, the following impairments were added in the 2016 Integrated List of Waters:
-Mine Brook (MA72-14): E. Coli impairment was added
-Hopping Brook (MA72-35): E. Coli impairment was added and Hopping Brook was reclassified as a Category 5 waterbody.

During Permit Year 2, the Town has modified its outfall mapping due to outfall investigation field work. 9 outfalls were removed from the MS4 mapping and will be recategorized as a different structure (e.g., culvert, BMP inlet) or removed because they did not exist. These modifications did not add or change any receiving waterbodies or impairments/TMDLs listed in the NOI.

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed **during this reporting period**: 4

*Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.*

BMP: Education and Outreach to Residents (Multi-media Methods)

Message Description and Distribution Method:

-Educational material on stormwater pollution prevention for households including proper car maintenance and washing, disconnection of downspouts and rain barrel installation, proper lawn maintenance and use of fertilizer, and proper pet waste, dumping, and septic system management was displayed on the Town's website.
-Scoop the Poop postcard is at the Town Clerk's office where people register their dogs. Pet waste education is also hung in public buildings and displayed as a slide on local cable TV. A pet waste PSA is included once a year in the "Bellingham Bulletin" newspaper.
-The 2019 Annual Drinking Water Quality Report included information about stormwater's impact on water quality (posted June 2020):https://www.bellinghamma.org/home/news/2019-annual-drinking-water-quality-report-now-available.
-In May 2020 DPW announces outfall inspections and advertised contact information to report suspected illicit discharges: https://www.bellinghamma.org/home/news/storm-drain-outfall-inspections-get-underway
-The following education was conducted as part of the 319 Nonpoint Source Grant funded Phase 1 Implementation of Bellingham's Subwatershed Management Plan Project # 18-05/319:
1. 319 sign titled "Our Solution to Stormwater Pollution" posted on June 29, 2020, at Municipal Center
2. Educational event at 300th Anniversary Park Dedication & Town Birthday Party with CRWA held on September 29, 2019
3. Article titled "Residents Gather for 300th Anniversary Park Dedication & Town Birthday Party" posted in the Bellingham Bulletin on October 30, 2020
4. Press release issued by CRWA on 6/29/2020 titled "Greening Town Hall to Address the #1 Pollutant to Massachusetts Rivers"
5. Posters were created to be hung in public spaces

Targeted Audience: Residents

Responsible Department/Parties: Planning Board

Measurable Goal(s):

This messaging is available to all visitors of the Town's DPW Stormwater Pollution Prevention for Households webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Education and Outreach to Industrial Facilities (Multi-media Methods)

Message Description and Distribution Method:

Educational material on stormwater pollution prevention for industrial sites including illicit discharge elimination, erosion prevention and sediment control, dust control, spill prevention, and salt storage is displayed on the Town's website: https://www.bellinghamma.org/planning-board/pages/stormwater-management-best-practices

Targeted Audience: Industrial Facilities

Responsible Department/Parties: Planning Board

Measurable Goal(s):

This messaging is available to all visitors of the Town's Planning Board Stormwater Management Best Practices webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Education and Outreach to Businesses (Multi-media Methods)

Message Description and Distribution Method:

Educational material on stormwater pollution prevention for businesses including the importance and benefits of pollution prevention, source reduction, reuse/recycling, energy recovery, and best management practices for anti-icing to minimize sand and salt use is displayed on the Town's website: https://www.bellinghamma.org/planning-board/pages/stormwater-management-best-practices

Targeted Audience: Businesses, Institutions, and Commercial Facilities

Responsible Department/Parties: Planning Board

Measurable Goal(s):

This messaging is available to all visitors of the Town's Planning Board Stormwater Management Best Practices webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Education and Outreach to Developers (Multi-media Methods)

Message Description and Distribution Method:

Educational materials on stormwater pollution prevention for developers including site selection, low impact development practices, sediment and erosion control measures, and other methods to prevent stormwater pollution are displayed on the Town's website: https://www.bellinghamma.org/planning-board/pages/stormwater-management-best-practices Additionally, a handout entitled "10 Steps to Stormwater Pollution Prevention on Small Residential Construction Sites" is distributed by the Building Department to to all contractors seeking a building permit for all sites with an acre of disturbance or less illustrating how they too should maintain stormwater during construction.

Targeted Audience: Developers

Responsible Department/Parties: Planning Board

Measurable Goal(s):

This messaging is available to all visitors of the Town's Planning Board Stormwater Management Best Practices webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period**:

The Stormwater Management Plan (SWMP) was posted for public review and made publicly available on the Town's website.
The Stormwater Management Program and associated current & future costs were discussed at multiple public meetings in Permit Year 2:
-November 13, 2019 Town Meeting (Establish Stormwater Management Enterprise Fund)

-September 30,2019 Finance Committee meeting (recommended Stormwater fee)
-June 8, 2020 Selectboard discussed and approved an initial Stormwater fee schedule
-June 22, 2020 Selectboard stormwater utility budget approved

Was this opportunity different than what was proposed in your NOI? Yes ○ No ◉

Describe any other public involvement or participation opportunities conducted **during this reporting period**:

• The Town offered discounted rain barrels for all residents and advertised this discount on the Town DPW's Facebook page and on the Town's website.
• The Town provides curbside Christmas tree collection for all residents one day in January.
•The Town's DPW held Yard Waste Curbside Pickup days on November 9 and November 16, 2019.
• The Town's annual Earth Day Charles River Cleanup was canceled due to COVID-19. Instead, the Town encouraged all residents to designate time to pick up trash throughout the month of April.
• The Household Hazardous Waste Day was help on July 11, 2020.

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

☐ This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period**.*

Number of SSOs identified: 0

Number of SSOs removed: 0

MS4 System Mapping

Below, check all that apply.

The following elements of the Phase I map have been completed:

☒ Outfalls and receiving waters
☒ Open channel conveyances
☐ Interconnections
☒ Municipally-owned stormwater treatment structures
☒ Waterbodies identified by name and indication of all use impairments
☒ Initial catchment delineations

Optional: Describe any additional progress you made on your map during this reporting period or provide additional status information regarding your map:

Phase I mapping reflects the location of Town drainage to the best of our knowledge and was developed from record drawings, field assessments, and institutional knowledge. The Town has no known interconnections to another MS4. The Town will update system mapping during ongoing fieldwork efforts.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses.

- (●) The outfall screening data is attached to the email submission
- ( ) The outfall screening data can be found at the following website:

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

Number of outfalls screened: 57

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- ( ) The catchment investigation data is attached to the email submission
- ( ) The catchment investigation data can be found at the following website:

Not Applicable

*Below, report on the number of catchment investigations completed **during this reporting period**.*

Number of catchment investigations completed this reporting period: 0

*Below, report on the percent of catchments investigated **to date.***

Percent of total catchments investigated: 0

Optional: Provide any additional information for clarity regarding the catchment investigations below:

The Town has not identified any problem catchments.

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- ( ) The illicit discharge removal report is attached to the email submission
- ( ) The illicit discharge removal report can be found at the following website:

*Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed **during this reporting period.***

Number of illicit discharges identified: 0

Number of illicit discharges removed: 0

Estimated volume of sewage removed: 0 gallons/day

Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed ***since the effective date of the permit (July 1, 2018)****.*

Total number of illicit discharges identified: 0

Total number of illicit discharges removed: 0

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

Employee Training

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

Town personnel completed a virtual IDDE Refresher training. Training did not occur until August 25, 2020 (17 DPW employees were trained).

MCM4: Construction Site Stormwater Runoff Control

Below, report on the construction site plan reviews, inspections, and enforcement actions completed ***during this reporting period****.*

Number of site plan reviews completed: 3

Number of inspections completed: 861

Number of enforcement actions taken: 1

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Below, select the option that describes your ordinance or regulatory mechanism progress.

- ○ Bylaw, ordinance, or regulations are updated and adopted consistent with permit requirements
- ○ Bylaw, ordinance, or regulations are updated consistent with permit requirements but are not yet adopted
- ◉ Bylaw, ordinance, or regulations have not been updated or adopted

As-built Drawings

Describe the measures the MS4 has utilized to require the submission of as-built drawings and ensure long term operation and maintenance of completed construction sites:

This requirement has been met through the adoption of Section 7 of the Planning Board's Procedural Regulations and the Planning Board's As-Built Policy, which requires the submission of as-built drawings and an operations and maintenance plan for permanent stormwater management systems. The September 2016 Planning Board As-Built Policy Handbook and Certificate are here: https://www.bellinghamma.org/planning-board/pages/built-policy-handbook-certificate

Street Design and Parking Lots Report

Describe the status of the street design and parking lots assessment due in year 4 of the permit term, including any planned or completed changes to local regulations and guidelines:

Preparation for the Street Design and Parking Lots Report has not yet begun as this requirement is due in Permit Year 4.

Green Infrastructure Report

Describe the status of the green infrastructure report due in year 4 of the permit term, including the findings and progress towards making the practice allowable:

Preparation for the Green Infrastructure Report has not yet begun as this requirement is due in Permit Year 4.

Retrofit Properties Inventory

Describe the status of the inventory, due in year 4 of the permit term, of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

Preparation for the Retrofit Properties Inventory has not yet begun as this requirement is due in Permit Year 4.

MCM6: Good Housekeeping

Catch Basin Cleaning

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins **during this reporting period**.*

Number of catch basins inspected: 219

Number of catch basins cleaned: 219

Total volume or mass of material removed from all catch basins: 500 cubic yards

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

Total number of catch basins: 2,423

If applicable:

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

Not applicable during this permit year. The Town tracks catch basins cleaning and inspections using a GIS-based tablet application. The tracking form includes depth measurements that can be used to calculate percent full. Therefore, the Town can complete targeted catch basin cleaning to reduce instances of excessive sediment loading. However, DPW staff were reduced during the COVID-19 pandemic, which impaired the Town's ability to complete catch basin cleaning. Cleaning has been ongoing since Spring 2019 and increased cleaning quantities have been reported for Permit Year 2. The Stormwater Utility will provide the funds needed to improve this program.

Street Sweeping

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

- ◉ Number of miles cleaned: 246.5
- ○ Volume of material removed: 1,100 cubic yards
- ○ Weight of material removed: 1,650 tons

O&M Procedures and Inventory of Permittee-Owned Properties

Below, check all that apply.

The following permittee-owned properties have been inventoried:

- ☒ Parks and open spaces
- ☒ Buildings and facilities
- ☒ Vehicles and equipment

The following O&M procedures for permittee-owned properties have been completed:

- ☒ Parks and open spaces
- ☒ Buildings and facilities
- ☒ Vehicles and equipment

Stormwater Pollution Prevention Plan (SWPPP)

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

Number of site inspections completed: 1

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

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- (•) Not applicable
- ( ) The results from additional reports or studies are attached to the email submission
- ( ) The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

Updates to the stormwater regulations were planned for Permit Year 2, however due to delay in the MA Stormwater Handbook updates and the Small MS4 General Permit revisions, the Town plans to complete these updates in Permit Year 3.

The Town has also developed portions of a draft Charles River Phosphorus Control Plan, including a legal analysis and an evaluation of life-cycle costs for various phosphorus reduction practices. The Town has developed a credit policy for the Stormwater Utility that will incentivize phosphorus reduction on private property.

COVID-19 Impacts

Optional: If any of the above year 2 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

All public meetings for the stormwater utility fee after March 2020 were conducted with Zoom.

The DPW site inspection was delayed due to COVID-19 safety restrictions; therefor the SWPPP was prepared in Permit Year 3.

DPW staff were reduced during the COVID-19 pandemic, which impaired the Town's ability to complete catch basin cleaning.

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 3 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Inspect all outfalls/ interconnections (excluding Problem and Excluded outfalls) for the presence of dry weather flow
- Complete follow-up ranking as dry weather screening becomes available

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all uncurbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary

Provide any additional details on activities planned for permit year 3 below:

The Town acknowledges the General Permit Year 3 requirements and will complete as many activities as possible based on funding and staff availability.

Part V: Certification of Small MS4 Annual Report 2020

40 CFR 144.32(d) Certification

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

Name: Donald DiMartino Title: DPW Director

Signature: Date: 9/28/20

[Signatory may be a duly authorized representative]

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

Annual Report Submission

Please submit the form electronically via email to both EPA and MassDEP by clicking on one of the links below or using the email addresses listed below. Please ensure that all required attachments are included in the email and not attached to this PDF.

EPA: stormwater.reports@epa.gov MassDEP: laura.schifman@mass.gov

Paper Signature:

If you did not sign electronically above, you can print the signature page by clicking the button below.

Print Signature Page

Optional: If you did not sign electronically above, you may lock the form by clicking the "Lock Form" button below which will prompt you to save the locked version of the form. Save this locked version under a new file name.

Lock Form

Summary of Bellingham's TMDLs and Impaired Waters [1, 2, 3]

Receiving Waterbody	2014 Category	2014 Water Quality Impairments [4]	2016 Category	2016 Water Quality Impairments [4]	Applicable General Permit Section	Change to Permit Requirements
Arnolds Brook (MA51-32)	5	E. Coli	5	E. Coli	Appendix H, Section III - Pathogens	None
Beaver Brook (MA72-12)	5	E. Coli	5	E. Coli	Appendix H, Section III - Pathogens	None
Peters River (MA51-18)	5	E. Coli Copper Lead	5	E. Coli Copper Lead	Appendix H, Section III - Pathogens Appendix H, Section V - Solids	None
Beaver Pond (MA72004)	4a		4a			None
Charles River (MA72-04)	5	Other Flow Regime Alterations Chlordane DDT Fishes Bioassessments Mercury in Fish Tissue	5	Flow Regime Modifications Chlordane in Fish Tissue DDT in Fish Tissue Fish Bioassessments Mercury in Fish Tissue		None
Charles River[5] (MA72-03)	5	DDT	5	DDT in Fish Tissue		None
Jenks Reservoir (MA51075)	4c	Non-Native Aquatic Plants	4c	Non-Native Aquatic Plants		None
Mine Brook[5] (MA72-14)	5	Habitat Assessment (Streams) Water Temperature	5	Habitat Assessment Temperature E. Coli	Appendix H, Section III - Pathogens	Requirements of Appendix H, Section III - Pathogens apply to this segment
Hopping Brook (MA72-35)	2		5	E. Coli	Appendix H, Section III - Pathogens	Requirements of Appendix H, Section III - Pathogens apply to this segment
Silver Lake (MA51150)	4c	Non-Native Aquatic Plants	4c	Non-Native Aquatic Plants		None
Lake Hiawatha (MA51062)	3		3			None
TMDL for Pathogens within the Charles River Watershed					Appendix F, Section A.III - Bacteria and Pathogen TMDL	None
Final TMDL for Nutrients in the Lower Charles River Basin					Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL	None
TMDL for Nutrients in the Upper/Middle Charles River					Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL	None

[1] TMDLs associated with major rivers may apply to additional waterbodies within the watershed.

[2] Any TMDL or impairments related to nutrients (nitrogen and phosphorus) apply to all receiving waterbodies within the watershed.

[3] Impairments in blue were added in the 2016 Integrated List of Waters.

[4] Impairments *without* an approved TMDL as of July 1, 2018. Note that some impairments have been renamed between 2014 and 2016 Integrated List of Waters: Other Flow Regime Alterations -> Flow Regime Modifications; Chlordane -> Chlordane in Fish Tissue; DDT -> DDT in Fish Tissue; Fishes Bioassessments -> Fish Bioassessments; Habitat Assessment (Streams) -> Habitat Assessment; Water Temperature -> Temperature

[5] Waterbody does not receive direct discharge from the MS4. MS4 discharges to a tributary/wetland of the waterbody. Included for reference only.

Permit Year 2 Outfall Investigation Summary

The *Bellingham Outfall Inventory and Dry Weather Screening Field Effort Summary – Spring 2020 and 2021* memorandum is included in the Bellingham IDDE Program available from the Bellingham Department of Public Works.

Phase I MS4 System Map

Summary of Bellingham's TMDLs and Impaired Waters [1, 2, 3]

Tighe&Bond

Receiving Waterbody	2014 Category	2014 Water Quality Impairments [4]	2016 Category	2016 Water Quality Impairments [4]	Applicable General Permit Section	Change to Permit Requirements
Arnolds Brook (MA51-32)	5	E. Coli	5	E. Coli	Appendix H, Section III - Pathogens	None
Beaver Brook (MA72-12)	5	E. Coli	5	E. Coli	Appendix H, Section III - Pathogens	None
Peters River (MA51-18)	5	E. Coli Copper Lead	5	E. Coli Copper Lead	Appendix H, Section III - Pathogens Appendix H, Section V - Solids	None
Beaver Pond (MA72004)	4a		4a			None
Charles River (MA72-04)	5	Other Flow Regime Alterations Chlordane DDT Fishes Bioassessments Mercury in Fish Tissue	5	Flow Regime Modifications Chlordane in Fish Tissue DDT in Fish Tissue Fish Bioassessments Mercury in Fish Tissue		None
Charles River[5] (MA72-03)	5	DDT	5	DDT in Fish Tissue		None
Jenks Reservoir (MA51075)	4c	Non-Native Aquatic Plants	4c	Non-Native Aquatic Plants		None
Mine Brook[5] (MA72-14)	5	Habitat Assessment (Streams) Water Temperature	5	Habitat Assessment Temperature E. Coli	Appendix H, Section III - Pathogens	Requirements of Appendix H, Section III - Pathogens apply to this segment
Hopping Brook (MA72-35)	2		5	E. Coli	Appendix H, Section III - Pathogens	Requirements of Appendix H, Section III - Pathogens apply to this segment
Silver Lake (MA51150)	4c	Non-Native Aquatic Plants	4c	Non-Native Aquatic Plants		None
Lake Hiawatha (MA51062)	3		3			None
TMDL for Pathogens within the Charles River Watershed					Appendix F, Section A.III - Bacteria and Pathogen TMDL	None
Final TMDL for Nutrients in the Lower Charles River Basin					Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL	None
TMDL for Nutrients in the Upper/Middle Charles River					Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL	None

[1] TMDLs associated with major rivers may apply to additional waterbodies within the watershed.

[2] Any TMDL or impairments related to nutrients (nitrogen and phosphorus) apply to all receiving waterbodies within the watershed.

[3] Impairments in blue were added in the 2016 Integrated List of Waters.

[4] Impairments *without* an approved TMDL as of July 1, 2018. Note that some impairments have been renamed between 2014 and 2016 Integrated List of Waters: Other Flow Regime Alterations -> Flow Regime Modifications; Chlordane -> Chlordane in Fish Tissue; DDT -> DDT in Fish Tissue; Fishes Bioassessments -> Fish Bioassessments; Habitat Assessment (Streams) -> Habitat Assessment; Water Temperature -> Temperature

[5] Waterbody does not receive direct discharge from the MS4. MS4 discharges to a tributary/wetland of the waterbody. Included for reference only.

HOLLISTON
MEDWAY
HOPEDALE
MENDON
FRANKLIN
MILLVILLE
BLACKSTONE
WRENTHAM
Chicken Brook-MA72-34
Hopping Brook-MA72-35
Charles River-MA72-04
Mill River-MA51-35
Beaver Pond-MA72004
Beaver Brook-MA72-12
Charles River-MA72-03
Nipmuck Pond-MA51111
Spring Brook-MA51-25
Mine Brook-MA72-14
Beaver Pond-MA72006
Silver Lake-MA51150
Lake Hiawatha-MA51062
Crane Pond-MA51030
Mill River-MA51-36
Arnolds Brook-MA51-32
Peters River-MA51-18
Jenks Reservoir-MA51075
Hales Pond-MA51057
Joes Rock Pond-MA51077
Miscoe Lake-MA51106
90

LEGEND

- BMP Point
- Manhole
- Drain Inlet
- Catch Basin
- Outfall
- Open Channel Point
- Drain Pipe
- Culvert
- Outfall Catchment
- MassDEP Open Water
- MassDEP Inland Wetlands
- Stream/Intermittent Stream
- Public Surface Water Supply (PSWS)
- Water Bodies
- Town Boundary
- Urbanized Area 2010
- Urbanized Area 2000
- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road

N

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0 1,000 2,000 4,000

Feet

PHASE 1 MAPPING

Permit Year 2 Annual Report
Bellingham, Massachusetts

November 2020

Tighe&Bond

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Permit Year 3

(July 1, 2020 – June 30, 2021)

Year 3 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2020-June 30, 2021

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2020 and June 30, 2021 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization: *Town of Bellingham*

EPA NPDES Permit Number: *MAR041091*

Primary MS4 Program Manager Contact Information

Name: *Donald DiMartino* Title: *DPW Director*

Street Address Line 1: *26 Blackstone Street*

Street Address Line 2:

City: *Bellingham* State: *MA* Zip Code: *02019*

Email: *DDimartino@bellinghamma.org* Phone Number: *(508) 966-5816*

Stormwater Management Program (SWMP) Information

SWMP Location (web address): *https://www.bellinghamma.org/stormwater*

Date SWMP was Last Updated: *October 2020*

If the SWMP is not available on the web please provide the physical address:

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here:

Impairment(s)

☑ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☑ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☑ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☑ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. ***By checking each box you are certifying that you have completed that permit requirement fully.*** *If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Year 3 Requirements

- ☐ Inspected and screened all outfalls/interconnections (excluding Problem and Excluded outfalls)
- ☑ Updated outfall/interconnection priority ranking based on the information collected during the dry weather inspections as necessary
- ☐ Post-construction bylaw, ordinance, or other regulatory mechanism was updated and adopted consistent with permit requirements

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above year 3 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

In Permit Year 3, the Town and their stormwater consultant completed outfall investigations to screen outfalls that had not been visited in a previous Permit Year and also attempted to field verify outfalls that could not be located during previous field efforts. The Town has attempted to inventory and screen all known MS4 outfalls as of the end of Permit Year 3 and the outfall inventory was updated as applicable. Approx. 74% were successfully screened, but the remaining 67 outfalls proved difficult to locate or access and require significant additional effort by DPW personnel. Due to the backlog of work for the DPW due to COVID-19 and wet weather conditions during summer 2021, the remaining outfall inspections could not be completed within Permit Year 3. The Town will continue to complete field work to locate and screen the remaining outfalls in Permit Year 4. The updated inventory and ranking for the Town's 257 MS4 outfalls is attached.

Because of the delay with the MA Stormwater Handbook and competing priorities for Town staff, the Town

did not complete updates to local code in Permit Year 3. Many of the 2016 General Permit requirements for oversight of development disturbing 1 acre or more are already being met through the Planning Board's Procedural Rules, Section 7, which requires a Stormwater Management Plan, Erosion & Sediment Control Plan, O&M Plan, Site Inspections, enforcement, etc. This will be a priority for Permit Year 4 whether the Handbook update is released or not; however it should be noted that it may create a temporary conflict and

Annual Requirements

- ☑ Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements
- ☑ Kept records relating to the permit available for 5 years and made available to the public
- ☑ The SSO inventory has been updated, including the status of mitigation and corrective measures implemented
  - ○ This is not applicable because we do not have sanitary sewer
  - ◉ This is not applicable because we did not find any new SSOs
  - ○ The updated SSO inventory is attached to the email submission
  - ○ The updated SSO inventory can be found at the following website:
- ☑ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- ☑ Provided training to employees involved in IDDE program within the reporting period
- ☑ All curbed roadways were swept at least once within the reporting period
- ☑ Updated system map due in year 2 as necessary
- ☑ Enclosed all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- ☑ Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- ☑ Updated inventory of all permittee owned facilities as necessary
- ☑ O&M programs for all permittee owned facilities have been completed and updated as necessary
- ☑ Implemented all maintenance procedures for permittee owned facilities in accordance with O&M programs
- ☑ Implemented program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- ☐ Inspected all permittee owned treatment structures (excluding catch basins)

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above annual requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

The Town-wide "Good Housekeeping and Pollution Prevention Operations and Maintenance Plan" developed in Permit Year 2 includes maintenance procedures for Town facilities and MS4 infrastructure, which are

implemented to the maximum extent practicable.

The Town inspected approximately 70 municipal stormwater basins and completed mowing efforts as applicable. Due to COVID-19 impacts and limited DPW staff, the Town was unable to inspect all inline proprietary BMPs in Permit Year 3 or complete maintenance. The Town intends to complete the annual

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- ☑ Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☑ Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- ☑ Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

- ☑ Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads
- ☑ Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Charles River Watershed Phosphorus TMDL

- ☑ Completed the funding source assessment

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The Town completed a preliminary financial analysis of various phosphorus reduction and pollutant removal

techniques and determined that additional revenue, as well as private property participation, would be required in order to meet the reduction goal. It was determined that a stormwater enterprise fund would be established in part to meet TMDL requirements, which was approved in Permit Year 2. A rate evaluation and 5-year revenue projections were completed and included in the draft Phosphorus Control Plan. On August 24, 2020, the Stormwater Utility Fee Regulations and Stormwater Fee Schedule were presented at a Board of Selectmen meeting and approved. An associated credit policy ("Stormwater Fee Adjustments & Credits") was finalized in September 2020, which incentivizes phosphorus reduction on private property. The first bills were issued in October 2020. More information: https://www.bellinghamma.org/department-public-works/pages/stormwater-utility-fees-regulations-and-adjust

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

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- (•) Yes
- ( ) No

If yes, describe below, including any relevant impairments or TMDLs:

Bellingham's NOI listed receiving waters based on the water quality limited waters within the Town's urbanized area that were included in the 2014 303(d) List. The Town has evaluated changes to the impairments and/or receiving waters based on the final 2016 303(d) List and he analysis is included in the Town's Permit Year 2 Annual Report and available in the Town's SWMP.

During Permit Year 3, the Town has modified its outfall mapping due to outfall investigation field work. 3 outfalls were removed from the outfall inventory and 2 outfalls were discovered during field investigations and added to the GIS mapping. These modifications did not add or change any receiving waterbodies or impairments/TMDLs listed in the NOI or Year 2 annual report. The attached outfall inventory includes the Major Basin and Receiving Water for every outfall.

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed **during this reporting period**: *4.00000000*

*Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.*

BMP:*Educational and Outreach to Residents - Pet Waste*

Message Description and Distribution Method:

A postcard entitled "Please Scoop the Poop" is handed out to all residents applying for a dog license. This messaging explains the impacts of pet waste on waterways and describes the actions that should be taken to mitigate the impact.

Targeted Audience: *Residents*

Responsible Department/Parties: *Planning Board*

Measurable Goal(s):

This messaging is available to all residents that apply for a pet license. In 2020, 1,819 licenses were issued and in 2021, 1,682 licenses were issued.

Message Date(s): *Ongoing*

Message Completed for: Appendix F Requirements ☑ Appendix H Requirements ☑

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:*Education and Outreach to Multiple Audiences - Town Website*

Message Description and Distribution Method:

Educational material on stormwater pollution prevention for industrial sites including anti-icing best management practices, pollution prevention for businesses, stormwater pollution prevention for developers, general construction and site supervision stormwater tips from MassDCR, and stormwater pollution prevention for small residential construction sites were displayed on the Town's website: https://www.bellinghamma.org/planning-board/pages/stormwater-management-best-practices

Targeted Audience: *Industrial Facilities, Businesses, Commercial Facilities, Developers*

Responsible Department/Parties: *Planning Board*

Measurable Goal(s):

This messaging was available to all visitors of the Town's Planning Board Stormwater Best Management Practices webpage.

Message Date(s): *Ongoing*

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:*Education and Outreach to Residents - Town Website*

Message Description and Distribution Method:

Educational material on stormwater pollution prevention for households identifying car oils, household pesticide and fertilizer applications, pet waste, yard clippings, and litter as contamination sources were displayed on the Town's DPW webpage. This also included links to educational coloring books, games, and activities for kids. Materials on the webpage included:
-"When it Rains, it Drains"
-"Soak up the Rain"
-"How Water Works"
-"Liquid Assets" (video link)
-"Mass Outdoor Watering Conservation Tips"
https://www.bellinghamma.org/department-public-works/pages/stormwater-information-updated

Additionally, the Town's Board of Health webpage includes an informational graphic "Be Septic Smart!" illustrating septic system best practices and proper maintenance.

Targeted Audience: *Residents*

Responsible Department/Parties: *DPW*

Measurable Goal(s):

This messaging was available to all visitors of the Town's DPW Stormwater Information and Board of Health webpages.

Message Date(s): *Ongoing*

Message Completed for: Appendix F Requirements ☑ Appendix H Requirements ☑

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:*Education and Outreach to All Audiences - Stormwater Utilitv*

Message Description and Distribution Method:

In Permit Year 2, Bellingham adopted a new stormwater utility fee to fund the costs associated with stormwater infrastructure management and the Charles River Watershed phosphorus TMDL. The fee schedule and regulations are posted on the Town's website, as well as an FAQ page:

Targeted Audience: *All Audiences*

Responsible Department/Parties: *DPW*

Measurable Goal(s):

These documents are available to all visitors of the Town's webpage.

Message Date(s): *Ongoing*

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period**:

The Stormwater Management Plan (SWMP) was posted for public review and made publicly available on the Town's website.

On August 24, 2020, the Stormwater Utility Fee Regulations and Stormwater Fee Schedule were presented at a Board of Selectmen meeting and approved. This meeting was made available to the public through Zoom. An associated credit policy ("Stormwater Fee Adjustments & Credits") was finalized in September 2020.

Was this opportunity different than what was proposed in your NOI? Yes ○ No ◉

Describe any other public involvement or participation opportunities conducted **during this reporting period**:

The annual Household Hazardous Waste Day was held on July 11, 2020.

The Town posted updated recycling center information to the Town website in April 2021. The Bellingham recycling center is available to residents Saturday and Sunday from 8am-2pm beginning in April for summer hours and on Saturdays 8am-2pm beginning in December for winter hours. The recycling center accepts metals, yard waste, oil based and latex paints, household appliances, mercury containing items, and more.

The annual Christmas tree pickup day was held on January 16, 2021. The Town announced this event on Facebook receiving 11 likes, 6 comments, and 9 shares.

Four yard waste curbside pickup days were held in Permit Year 3: twice in the fall of 2020 on November 14 and 21 and twice in the spring of 2021 on May 8 and 15. The Town announced the fall pickup twice on Facebook. The October Facebook post received 6 likes, 3 comments, and 8 shares. The November post received 5 likes and 5 shares. The spring Facebook announcement posted in May received 5 likes and 5 shares.

The 2020 Rain Barrel Program was posted on Facebook on July 29, 2020. The Town held a rain barrel pick-up day on September 3, 2020. The Facebook post received 12 likes, 3 comments, and 7 shares. The 2021 Rain Barrel Program was advertised on the town website and posted to Facebook on April 6, 2021. The Town held a rain barrel pick-up day on May 27th 2021 for residents who chose to participate. The Facebook post

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

☐ This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period**.*

Number of SSOs identified: *0.00000000*

Number of SSOs removed: *0.00000000*

MS4 System Mapping

Optional: Provide additional status information regarding your map:

The Town continues to update system mapping during ongoing field work efforts.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses. Please also include the updated inventory and ranking of outfalls/interconnections based on monitoring results.

○ No outfalls were inspected

◉ The outfall screening data is attached to the email submission

○ The outfall screening data can be found at the following website:

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

Number of outfalls screened: *60.000000*

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

Percent of outfalls screened: *74.000006*

Optional: Provide additional information regarding your outfall/interconnection screening:

The Town has attempted to field locate, inventory, and screen all known MS4 outfalls as of the end of Permit Year 3. In Permit Year 3, the Town and their stormwater consultant completed outfall investigations to screen outfalls that had not been visited in a previous Permit Year and also attempted to field verify outfalls that could not be located during previous field efforts. Approx. 74% of the Town's MS4 outfalls have been inventoried and screened as of June 30, 2021 and the outfall inventory was updated as necessary. 67 mapped outfalls have not been screened because they have proved to be difficult to locate or access and require significant extra effort by DPW personnel to field verify. Due to the backlog of work for the DPW due to COVID-19 and wet weather conditions during summer 2021, the Town was unable to complete the remaining inspections within Permit Year 3, but will continue to complete field work to locate and screen the remaining outfalls in Permit Year 4. This will likely be easiest in late Fall / Winter when vegetation is dormant.

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- (●) No catchment investigations were conducted
- ( ) The catchment investigation data is attached to the email submission
- ( ) The catchment investigation data can be found at the following website:

*Below, report on the number of catchment investigations completed **during this reporting period**.*

Number of catchment investigations completed this reporting period: *0*

*Below, report on the percent of catchments investigated **to date.***

Percent of total catchments investigated: *0*

Optional: Provide any additional information for clarity regarding the catchment investigations below:

There are no Problem Outfalls in Bellingham. Catchment investigations will begin in Permit Year 4 after the remaining outfalls are located and screened.

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- (●) No illicit discharges were found
- ( ) The illicit discharge removal report is attached to the email submission
- ( ) The illicit discharge removal report can be found at the following website:

Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed ***during this reporting period.***

Number of illicit discharges identified: *0.00000000*

Number of illicit discharges removed: *0.00000000*

Estimated volume of sewage removed: *0.00000000* gallons/day

Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed ***since the effective date of the permit (July 1, 2018)****.*

Total number of illicit discharges identified: *0.00000000*

Total number of illicit discharges removed: *0.00000000*

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

Employee Training

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

Town personnel completed a virtual IDDE Refresher training on August 25, 2020, which was attended by 17 DPW employees, as described in the Permit Year 2 annual report.

An IDDE Program training was held on June 28, 2021 for applicable Town personnel, with attendance documented.

MCM4: Construction Site Stormwater Runoff Control

Below, report on the construction site plan reviews, inspections, and enforcement actions completed ***during this reporting period****.*

Number of site plan reviews completed: *2.00000000*

Number of inspections completed: *800.0000000*

Number of enforcement actions taken: *0.00000000*

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

The number of inspections completed was estimated. The Town will confirm the number of inspections completed if possible and provide it in the updated SWMP. There were no formal enforcement actions, which would be needed only if corrective actions are not completed as requested.

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

As-built Drawings

Below, report on the number of as-built drawings received ***during this reporting period****.*

Number of as-built drawings received: *1.0000000*

Optional: Enter any additional information relevant to the submission of as-built drawings:

Section 7 of the Planning Board's Procedural Regulations and the Planning Board's As-Built Policy requires the submission of as-built drawings and an operations and maintenance plan for permanent stormwater management systems. The September 2016 Planning Board As-Built Policy Handbook and Certificate are here: https://www.bellinghamma.org/planning-board/pages/built-policy-handbook-certificate

Street Design and Parking Lots Report

Describe the status of the street design and parking lots assessment due in year 4 of the permit term, including any planned or completed changes to local regulations and guidelines:

Preparation of the Street Design and Parking Lots Report has not begun yet as this requirement is due in Permit Year 4.

Green Infrastructure Report

Describe the status of the green infrastructure report due in year 4 of the permit term, including the findings and progress towards making the practice allowable:

Preparation of the Green Infrastructure Report has not begun yet as this requirement is due in Permit Year 4.

Retrofit Properties Inventory

Describe the status of the inventory, due in year 4 of the permit term, of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

Preparation of the Retrofit Properties Report has not begun yet as this requirement is due in Permit Year 4.

MCM6: Good Housekeeping

Catch Basin Cleaning

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins **during this reporting period**.*

Number of catch basins inspected: *2043.00000*

Number of catch basins cleaned: *2043.0000000*

Total volume or mass of material removed from all catch basins: *1950.000000* *cubic yards*

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

Total number of catch basins: *2513.00000*

If applicable:

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

Street Sweeping

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

- ○ Number of miles cleaned: *119.00000000*
- ◉ Volume of material removed: *1125.00000000* *cubic yards*
- ○ Weight of material removed: *[Select Units]*

Stormwater Pollution Prevention Plan (SWPPP)

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

Number of site inspections completed: *5.00000000*

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

As described in the Permit Year 2 annual report, development of the Town's SWPPPs was delayed due to COVID-19. In Year 3, the SWPPPs were finalized and quarterly inspections began. The Town completed 2 inspections at the DPW Facility and 3 inspections at the Recycling Center Facility in Permit Year 3.

At the DPW it was identified that the swales and detention ponds needed to be cleaned. Mowing is being

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- (●) Not applicable
- ( ) The results from additional reports or studies are attached to the email submission
- ( ) The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

Values provided for street sweepings and catch basin cleanings are estimated. The Town intends to improve tracking of mileage cleaned moving forward by using a GPS-based system.

COVID-19 Impacts

Optional: If any of the above year 3 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

COVID-19 impacts are discussed above as applicable to specific requirements.

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 4 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree☑

- Develop a report assessing current street design and parking lot guidelines and other local requirements within the municipality that affect the creation of impervious cover
- Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist
- Identify a minimum of 5 permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious areas

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all curbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary
- Review O&M programs for all permittee owned facilities; update if necessary
- Implement all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implement program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Enclose all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- Review as-built drawings for new and redevelopment to ensure compliance with post construction bylaws, regulations, or regulatory mechanism consistent with permit requirements
- Inspect all permittee owned treatment structures (excluding catch basins)

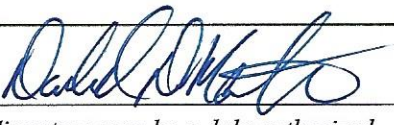
Provide any additional details on activities planned for permit year 4 below:

The Town acknowledges the General Permit Year 4 requirements and will complete as many activities as possible based on funding and staff availability.

Part V: Certification of Small MS4 Annual Report 2021

40 CFR 144.32(d) Certification

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

Name:	Donald DiMartino	Title:	DPW Director
Signature:		Date:	9/28/21

[Signatory may be a duly authorized representative]

Permit Year 3 Outfall Investigation Summary

The *Bellingham Outfall Inventory and Dry Weather Screening Field Effort Summary – Spring 2020 and 2021* memorandum is included in the Bellingham IDDE Program available from the Bellingham Department of Public Works.

Permit Year 4

(July 1, 2021 – June 30, 2022)

Year 4 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2021-June 30, 2022

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2021 and June 30, 2022 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization: Town of Bellingham

EPA NPDES Permit Number: MAR041091

Primary MS4 Program Manager Contact Information

Name: Donald DiMartino Title: DPW Director

Street Address Line 1: 26 Blackstone Street

Street Address Line 2:

City: Bellingham State: MA Zip Code: 02019

Email: DDimartino@bellinghamma.org Phone Number: (508) 966-5816

Stormwater Management Program (SWMP) Information

SWMP Location (web address): https://www.bellinghamma.org/stormwater

Date SWMP was Last Updated: October 2021

If the SWMP is not available on the web please provide the physical address:

Latest October 2021 version is available at 26 Blackstone Street. After the Annual Report is submitted, an updated SWMP with Year 4 records including this report will be published to the stormwater website.

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☒ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☒ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. ***By checking each box you are certifying that you have completed that permit requirement fully.*** *If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Year 4 Requirements

☒ Developed a report assessing current street design and parking lot guidelines and other local requirements within the municipality that affect the creation of impervious cover, made it available as part of the SWMP, and:

- ○ No updates were recommended
- ◉ Updates were recommended. The anticipated date or date of completion for updates is/was:

Anticipated updates to Town bylaws and regulations in July 2025 and July 2026

☒ Developed a report assessing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist, made it available as part of the SWMP, and:

- ○ No updates were recommended
- ◉ Updates were recommended. The anticipated date or date of completion for updates is/was:

Anticipated updates to Town bylaws and regulations in July 2025 and July 2026

☒ Identified a minimum of 5 permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious cover

Optional: If you would like to describe progress made on any incomplete requirements listed above, provide an update on previous incomplete milestones, or provide any additional details, please use the box below:

A report assessing current street design & parking lot guidelines and feasibility of allowing green infrastructure was completed in Permit Year 4.

Annual Requirements

- ☒ Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements
- ☒ Kept records relating to the permit available for 5 years and made available to the public
- ☒ The SSO inventory has been updated, including the status of mitigation and corrective measures implemented
  - ○ This is not applicable because we do not have sanitary sewer
  - ◉ This is not applicable because we did not find any new SSOs
  - ○ The updated SSO inventory is attached to the email submission
  - ○ The updated SSO inventory can be found at the following website:
- ☒ Updated system map due in year 2 as necessary
- ☒ Provided training to employees involved in IDDE program within the reporting period
- ☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- ☒ All curbed roadways were swept at least once within the reporting period
- ☒ Enclosed all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- ☒ Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- ☒ Updated inventory of all permittee owned facilities as necessary
- ☒ O&M programs for all permittee owned facilities have been completed and updated as necessary
- ☒ Implemented all maintenance procedures for permittee owned facilities in accordance with O&M programs
- ☒ Implemented program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- ☐ Inspected all permittee owned treatment structures (excluding catch basins)

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Similar to previous permit years, the Town's "Good Housekeeping and Pollution Prevention Program for Municipal Operations and Maintenance" includes maintenance procedures for Town facilities and MS4 infrastructure, which are implemented to the maximum extent practicable. The Town's inventory of facilities is updated continuously, however, in Permit Year 5 the Town will incorporate all changes to date in the O&M Plan.

The Town inspected approximately 75 of the municipal stormwater basins and completed mowing and weed whacking as necessary. Integration of inline proprietary BMPs into the Town's GIS database with digital inspection forms using PeopleGIS is planned for Permit Year 5.

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

☒ Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate

☒ Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time

☒ Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Similar to last permit year, the Scoop the Poop Postcards are available at the Town Clerk's office where dog owners go to apply and renew dog licenses. Additional pet waste education was available on the DPW website and an add ran in the monthly issue of the Bulletin.

The Town's Board of Health webpage includes an informational graphic "Be Septic Smart!" illustrating septic system best practices and proper maintenance which is available to anyone who visits the webpage.

Solids, Oil and Grease (Hydrocarbons), or Metals

Annual Requirements

Good Housekeeping and Pollution Prevention for Permittee Owned Operations

☒ Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads

- ◉ The street sweeping schedule is attached to the email submission
- ○ The street sweeping schedule can be found at the following website:

☐ Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Due to the impacts of Covid-19, catch basins cleaning was limited due to the Town's contractor, Solid Waste Solutions, having significant issues with equipment part delivery delays and staffing problems. This limited the company's ability to remove the old catch basin cleaning waste from Permit Year 3 thereby affecting the Town's available space for stockpiling additional cleaning debris at the DPW yard. 492 inlets were cleaned from July 1, 2021 to June 30, 2022. The catch basin cleaning locations, dates, and percent filled was collected as part of the inspection.

Charles River Watershed Phosphorus TMDL

☒ Defined the scope of the Phosphorus Control Plan (PCP). *Please select one of the following:*

- ○ The PCP scope is the entire area within our jurisdiction within the Charles River Watershed

- (●) The PCP scope is the urbanized area portion of our jurisdiction within the Charles River Watershed

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

NON-TRADITIONAL AND TRANSPORTATION MS4s ONLY- municipalities please skip this section:

☐ Estimated the current impervious area of permittee owned property, determined the Land Use information for permittee owned property, calculated the phosphorus removal in pounds per year for any structural BMP owned by the permittee in accordance with Appendix F Attachment 3, and recorded the date of last maintenance activity for all structural BMPs for which phosphorus removal is calculated

- ○ The above information is attached to the email submission
- ○ The above information can be found at the following website:

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

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- (●) Yes
- ( ) No

If yes, describe below, including any relevant impairments or TMDLs:

Bellingham's NOI listed water quality impairments and TMDLs for the Town's receiving waters based on the 2014 303(d) List. In Permit Year 2, the Town evaluated changes to the impairments and/or receiving waters based on the final 2016 303(d) List and the analysis was submitted with the Town's Permit Year 2 Annual Report and is available in the Town's SWMP.

In Permit Year 4, the Town evaluated any changes to the impairments and/or receiving waters based on the final 2018/2020 303(d) List and the analysis is included as an attachment with this report.

In Permit Year 4, 4 outfalls (24-5, 25-3, 25-6, and 2-8) were removed from the outfall inventory because they either did not exist or needed to be recategorized as another stormwater structure. These modifications did not add or change any receiving waterbodies or impairments/TMDLs listed in the NOI.

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed **during this reporting period**: 5

*Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.*

BMP:Education and Outreach to Residents - Town Website

Message Description and Distribution Method:

Educational materials remain on the Town's DPW webpage on stormwater pollution prevention for households identifying car oils, household pesticide and fertilizer applications, pet waste, yard clippings, and litter as contamination sources. This also included links to educational coloring books, games, and activities for kids. Materials on the webpage included:
-"When it Rains, it Drains"
-"Soak up the Rain"
-"How Water Works"
-"Liquid Assets" (video link)
-"Mass Outdoor Watering Conservation Tips"
https://www.bellinghamma.org/department-public-works/pages/stormwater-information-updated

Additionally, the Town's Board of Health webpage includes an informational graphic "Be Septic Smart!" illustrating septic system best practices and proper maintenance.

Targeted Audience: Residents

Responsible Department/Parties: DPW

Measurable Goal(s):

This messaging was available to all visitors of the Town's DPW Stormwater Information and Board of Health webpages.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Educational and Outreach to Residents - Pet Waste

Message Description and Distribution Method:

Similar to last permit year, a postcard entitled "Please Scoop the Poop" is available at the Town Clerk's office where residents apply for a dog license. This messaging explains the impacts of pet waste on waterways and describes the actions that should be taken to mitigate the impact.

Targeted Audience: Residents

Responsible Department/Parties: Planning/zoning Department

Measurable Goal(s):

The postcards are available to all Town Clerk visitors.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Educational and Outreach to Residents - Pet Waste

Message Description and Distribution Method:

The DPW website provides education information to residents on pet waste entitled "Do Your Doody for Clean Water".

Targeted Audience: Residents

Responsible Department/Parties: DPW

Measurable Goal(s):

These documents are available to all visitors of the Town's DPW webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ○

If yes, describe why the change was made:

BMP:Education and Outreach to All Audiences - Stormwater Utility

Message Description and Distribution Method:

Like previous permit years, the Town's stormwater utility fee schedule and regulations are posted on the Town's website, as well as an FAQ page: https://www.bellinghamma.org/sites/g/files/vyhlif2796/f/uploads/stormwater_utility_handout_final.pdf

Targeted Audience: All Audiences

Responsible Department/Parties: DPW

Measurable Goal(s):

These documents are available to all visitors of the Town's webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Education and Outreach to Multiple Audiences - Town Website

Message Description and Distribution Method:

Similar to past permit years, educational material on stormwater pollution prevention for industrial sites including anti-icing best management practices, pollution prevention for businesses, stormwater pollution prevention for developers, general construction and site supervision stormwater tips from MassDCR, and stormwater pollution prevention for small residential construction sites remains displayed on the Town's website: https://www.bellinghamma.org/planning-board/pages/stormwater-management-best-practices

Targeted Audience: Industrial Facilities, Businesses, Commercial Facilities, Developers

Responsible Department/Parties: Planning Board

Measurable Goal(s):

This messaging was available to all visitors of the Town's Planning Board Stormwater Best Management Practices webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ○

If yes, describe why the change was made:

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period**:

The Stormwater Management Plan (SWMP) remains publicly available on the Town's stormwater website for ongoing public review and feedback.

Was this opportunity different than what was proposed in your NOI? Yes ○ No ◉

Describe any other public involvement or participation opportunities conducted **during this reporting period**:

Hazardous Waste Collection Day - Household hazardous waste collection day was held on July 24, 2021.

The Bellingham recycling center remains available to residents Saturday and Sunday from 8am-2pm beginning in April for summer hours and on Saturdays 8am-2pm beginning in December for winter hours. The recycling center accepts metals, yard waste, oil based and latex paints, household appliances, mercury containing items, and more.

There were over 60 volunteers for Bellingham's annual Earth Day cleanup, which was held on April 23rd, 2022. In all, volunteers, both individuals as well as groups such as those from Amazon (who did their own cleanup on Maple Street), the Board of Health and the Bellingham High School Football team, collected 106 bags of trash that day. Local business sponsors/donors included: Honey Dew, Stop and Shop, Market Basket and Aroma Pizza. DPW and the Bellingham Police also participated in the event.

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

☐ This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period**.*

Number of SSOs identified: 0

Number of SSOs removed: 0

MS4 System Mapping

Optional: Provide additional status information regarding your map:

Building upon efforts from previous permit years, the Town continues to refine the MS4 GIS mapping as the

IDDE program is implemented and outfall investigations are completed.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses. Please also include the updated inventory and ranking of outfalls/interconnections based on monitoring results.

- ○ No outfalls were inspected
- ◉ The outfall screening data is attached to the email submission
- ○ The outfall screening data can be found at the following website:

N/A - There was no dry weather flow for 19 outfalls inspected and 1 outfall was located but inaccessible to collect a sample, so no new screening data is attached. Inventory information was updated in the geodatabase.

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

Number of outfalls screened: 19

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

Percent of outfalls screened: 82

Optional: Provide additional information regarding your outfall/interconnection screening:

In Permit Year 4, the Town and their stormwater consultant made progress with outfall investigations by revisiting and screening 24 outfalls that could not be located or accessed in previous Permit Years. As noted on p. 6, 4 outfalls were removed from the inventory. There was no dry weather flow for 19 outfalls inspected and 1 outfall was located but inaccessible to collect a sample, so no new screening data is attached. Approx. 82% of the Town's MS4 outfalls have been inventoried and screened as of June 30, 2021 and the outfall inventory was updated as necessary. 45 mapped outfalls have not been screened because they have proved to be difficult to locate or access. The Town plans to locate and screen these remaining 45 in PY5.

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- ◉ No catchment investigations were conducted
- ○ The catchment investigation data is attached to the email submission
- ○ The catchment investigation data can be found at the following website:

*Below, report on the number of catchment investigations completed **during this reporting period**.*

Number of catchment investigations completed this reporting period: 0

*Below, report on the percent of catchments investigated **to date.***

Percent of total catchments investigated: 0

Optional: Provide any additional information for clarity regarding the catchment investigations below:

Catchment investigations are anticipated to begin in PY5, beginning with high priority catchments.

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- (●) No illicit discharges were found
- ( ) The illicit discharge removal report is attached to the email submission
- ( ) The illicit discharge removal report can be found at the following website:

*Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed **during this reporting period.***

Number of illicit discharges identified: 0

Number of illicit discharges removed: 0

Estimated volume of sewage removed: 0 gallons/day

*Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed **since the effective date of the permit (July 1, 2018)**.*

Total number of illicit discharges identified: 0

Total number of illicit discharges removed: 0

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

There were no illicit discharges to the MS4 identified through the IDDE program or catch basin inspections. The DPW is not aware of any spills or illegal dumping impacting the MS4 during Year 4.

Employee Training

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

An MS4 program employee training was conducted for 17 town staff on June 28th that served as a refresher for IDDE and good housekeeping.

The DPW Director attended all of the Phosphorus Control Planning Workshop webinars conducted by Charles River Watershed Association starting in March 2022. More information about this four-part series is here: https://www.crwa.org/phosphorus-control-planning-support.html

MCM4: Construction Site Stormwater Runoff Control

*Below, report on the construction site plan reviews, inspections, and enforcement actions completed **during this reporting period**.*

Number of site plan reviews completed: 7

Number of inspections completed: 0

Number of enforcement actions taken: 0

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

The following seven projects are listed on the Planning Board website were under review and/or approved during Permit Year 4: Prospect Hill Estates, Red Mill on the Charles Residential Development, 190 Farm St, 164 Mechanic St – Bellingham Nursery, 30 Locust St – Bungay Brook Estate, 206 Mechanic St, 152 Depot St Warehouse. https://www.bellinghamma.org/planning-board

Projects that are under construction are inspected by the Town on a daily basis. However, we were unable to estimate the total number of individual inspections this year. The recently hired GIS Coordinator plans to develop an inspection form to better track construction period inspections.

Similar to previous permit years, there were no formal enforcement actions, which are only needed if corrective actions are not completed as requested.

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Date update was completed (due in year 3):

As-built Drawings

*Below, report on the number of as-built drawings received **during this reporting period**.*

Number of as-built drawings received: 0

Optional: Enter any additional information relevant to the submission of as-built drawings:

The Town has been able to require and enforce stormwater management standards through Article IX of the Town of Bellingham Zoning Bylaws Section 240-54 and in Section 7 of the Planning Board Procedural Rules. The Town planned to revise and clarify updated standards in the Planning Board Procedural Rules since the MA Stormwater Handbook has not yet been updated to meet EPA's stadards. However, the Town Planner left in September 2021 and the position has not been filled. Laguage has been drafted, and the Town plans to update the regulations in PY5 along with relevant recommendations of the local code assessment.

Retrofit Properties Inventory

Below, list the permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas (at least 5):

1. South Main Street (Design completed)
2. 26 Pearl Street
3. 292 Hartford Avenue
4. Depot St - Parcel 0038-0023-0000, soon to be town-owned
5. Depot St across from 215 St - Parcel 0038-0023, soon to be town-owned

Prioritization of these sites is subject to change based on available funding and further feasibility assessment, design, and permitting of projects. The Town has a short-list of alternative sites if one of these 5 sites is less desirable.

MCM6: Good Housekeeping

Catch Basin Cleaning

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins **during this reporting period**.*

Number of catch basins inspected: 429

Number of catch basins cleaned: 429

Total volume or mass of material removed from all catch basins: 0 [Select Units]

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

Total number of catch basins: 2,655

If applicable:

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

A minimal amount of material was removed from catch basins (measurement unknown) based on staffing limitations and trouble getting the catch basin material hauled off-site in PY4. The company Solid Waste Solutions had equipment part delivery delays following significant staffing issues. They have not been in Bellingham to remove the end of the old catch basin cleanings from late PY3. The sweeping piles from PY4 are still on site as well and the quantity removed for street sweeping below is only through the end of 2021. The Town plans to hire an outside contractor in Permit Year 5.

Street Sweeping

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

- ○ Number of miles cleaned:
- ○ Volume of material removed: [Select Units]
- ◉ Weight of material removed: 1,425 tons

Stormwater Pollution Prevention Plan (SWPPP)

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

Number of site inspections completed: 8

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

DPW Facility: In the 1st quarter two swales were recorded clear of debris. In the 3rd and 4th quarter, the retention pond and riprap swale needed to be cleaned and riprap replaced. Work is ongoing.

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- ◉ Not applicable
- ○ The results from additional reports or studies are attached to the email submission
- ○ The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

COVID-19 Impacts

Optional: If any of the above year 4 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

Due to the impacts of Covid-19, catch basins cleaning was limited due to the Town's contractor, Solid Waste Solutions, having significant issues with equipment part delivery delays and staffing problems. This limited the company's ability to remove the old catch basin cleaning waste from Permit Year 3 thereby affecting the Town's available space for additional cleaning debris. 492 inlets were cleaned from July 1, 2021 to June 30, 2022.

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 5 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all curbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary
- Review O&M programs for all permittee owned facilities; update if necessary
- Implement all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implement program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Enclose all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt

- Review as-built drawings for new and redevelopment to ensure compliance with post construction bylaws, regulations, or regulatory mechanism consistent with permit requirements
- Inspect all permittee owned treatment structures (excluding catch basins)
- Identify additional permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious areas so that the permittee maintains a minimum of 5 sites in their inventory, until such a time when the permittee has less than 5 sites remaining

Provide any additional details on activities planned for permit year 5 below:

The Town acknowledges the General Permit Year 5 requirements and will completes as many activities as possible based on funding and staff availability.

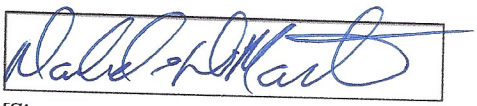
Part V: Certification of Small MS4 Annual Report 2021

40 CFR 144.32(d) Certification

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

Name: Donald DiMartino

Title: DPW Director

Signature: 

Date: 9/28/22

[Signatory may be a duly authorized representative]

Summary of Bellingham's TMDLs and Impaired Waters [1, 2, 3]

Receiving Waterbody	2016 Category	2016 Water Quality Impairments [4]	Applicable General Permit Section	2018/2020 Category	2018/2020 Water Quality Impairments [6]	Applicable General Permit Section	Changes to Permit Requirements
Arnolds Brook (MA51-32)	5	E. Coli	Appendix H, Section III - Pathogens	5	E. Coli	Appendix H, Section III - Pathogens	None
Beaver Brook (MA72-12)	5	E. Coli	Appendix H, Section III - Pathogens	5	E. Coli	Appendix H, Section III - Pathogens	None
Peters River (MA51-18)	5	E. Coli Copper Lead	Appendix H, Section III - Pathogens Appendix H, Section V - Solids	5	E. Coli Temperature	Appendix H, Section III - Pathogens ~~Appendix H, Section V - Solids~~	None
Beaver Pond (MA72004)	4a			4a			None
Charles River (MA72-04)	5	Flow Regime Modifications Chlordane in Fish Tissue DDT in Fish Tissue Fish Bioassessments Mercury in Fish Tissue		5	Flow Regime Modification Ambient Bioassays - Chronic Aquatic Toxicity Chlordane in Fish Tissue DDT in Fish Tissue E. Coli Fish Bioassessments Mercury in Fish Tissue Nutrient/Eutrophication Biological Indicators Phosphorus, Total Temperature		None
Charles River[5] (MA72-03)	5	DDT in Fish Tissue		5	Algae DDT in Fish Tissue Dissolved Oxygen Supersaturation E.Coli Organic Enrichment (Sewage) Biological Indicators Phosphorus, Total		None
Jenks Reservoir (MA51075)	4c	Non-Native Aquatic Plants		4c	Non-Native Aquatic Plants		None
Mine Brook[5] (MA72-14)	5	Habitat Assessment Temperature E. Coli	Appendix H, Section III - Pathogens	5	Habitat Assessment E.Coli Temperature	Appendix H, Section III - Pathogens	None
Hopping Brook (MA72-35)	5	E. Coli	Appendix H, Section III - Pathogens	5	E.Coli	Appendix H, Section III - Pathogens	None
Silver Lake (MA51150)	4c	Non-Native Aquatic Plants		4c	Non-Native Aquatic Plants		None
Lake Hiawatha (MA51062)	3			3			None
TMDL for Pathogens within the Charles River Watershed			Appendix F, Section A.III - Bacteria and Pathogen TMDL				None
Final TMDL for Nutrients in the Lower Charles River Basin			Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL				None
TMDL for Nutrients in the Upper/Middle Charles River			Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL				None

[1] TMDLs associated with major rivers may apply to additional waterbodies within the watershed.

[2] Any TMDL related to nutrients (nitrogen and phosphorus) applies to all receiving waterbodies within the watershed.

[3] Impairments in blue were added in the 2016 Integrated List of Waters.

[4] Impairments *without* an approved TMDL as of July 1, 2018. Note that some impairments have been renamed between 2014 and 2016 Integrated List of Waters: Other Flow Regime Alterations -> Flow Regime Modifications; Chlordane -> Chlordane in Fish Tissue; DDT -> DDT in Fish Tissue; Fishes Bioassessments -> Fish Bioassessments; Habitat Assessment (Streams) -> Habitat Assessment; Water

[5] Waterbody does not receive direct discharge from the MS4. MS4 discharges to a tributary/wetland of the waterbody. Included for reference only.

[6] Impairments in green were added in the 2018/2020 Integrated List of Waters

SWEEPING DATES ____ to ____

Town of Bellingham, Massachusetts

Street Map

6-30-2021
7-1-2021
7-14-2021
7-15-2021
7-16-2021
7-19-2021
7-21-2021

Legend

- Parcels
- Water Bodies

0 0.225 0.45 Miles

1 inch = 1,500 feet

Roadway Ownership

- Town
- State
- Private
- Cemetery

This map is intended to support the inventory of real property of the Town of Bellingham. Map data should not be interpreted as the actual field survey data. This data should not be used for legal description or conveyance purposes.

Date: March 2020

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Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-8
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrell Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Berline St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleurette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
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Freeman St.	A-9
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Gail Dr.	B-6
Garden St.	A-9
Gateway Rd.	B-5
Gemmur Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-8
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
Link St.	B-9
Linwood Av.	A-9
Lisa Anne Dr.	B-3
Littletree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
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Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
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North St.	A-5, B-5, B-6
Northeast Dr.	B-4
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Oak Terrace West	A-9
Old Blackstone	C-5
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Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
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Paul Rd.	B-3
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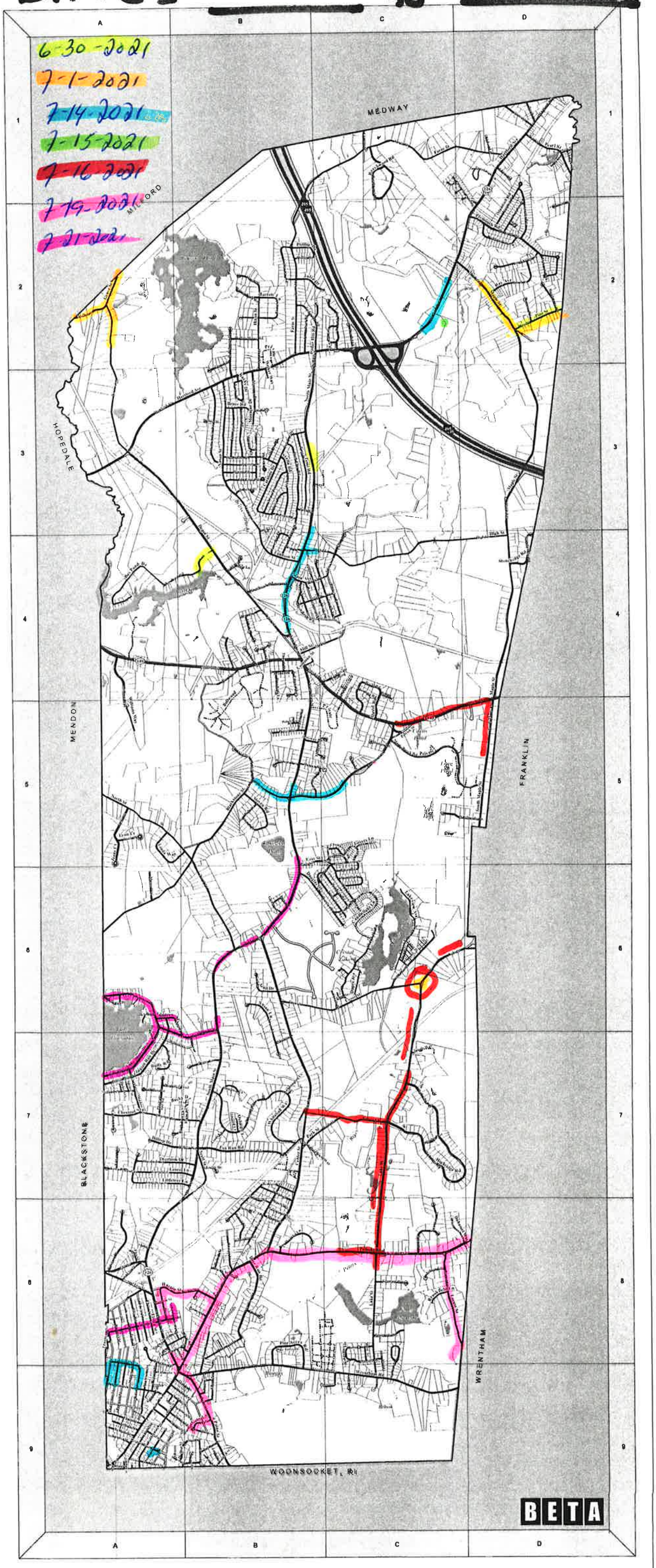
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Roma Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Stevan Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehandge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3



SWEEPING DATES to

Town of Bellingham, Massachusetts

Street Map

Legend

- Parcels
- Water Bodies

0 0.225 0.45 Miles

1 inch = 1,500 feet

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Elm St. Rear	A-8
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Elvira St.	A-8, A-9
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Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
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High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
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John Alden Cir.	D-2
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Judy Ln.	B-4
Julia Dr.	B-2, C-2
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Kensington Ct.	B-7
Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
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Liberty St.	B-8
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
Link St.	B-9
Linwood Av.	A-9
Lisa Anne Dr.	B-3
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Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
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Marc Ave.	C-9
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Mechanic St.	B-4, C-4, C-5, D-4
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Mendon St.	A-4, B-4
Middle Ave	B-4
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Norfolk St.	A-9
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Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
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Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
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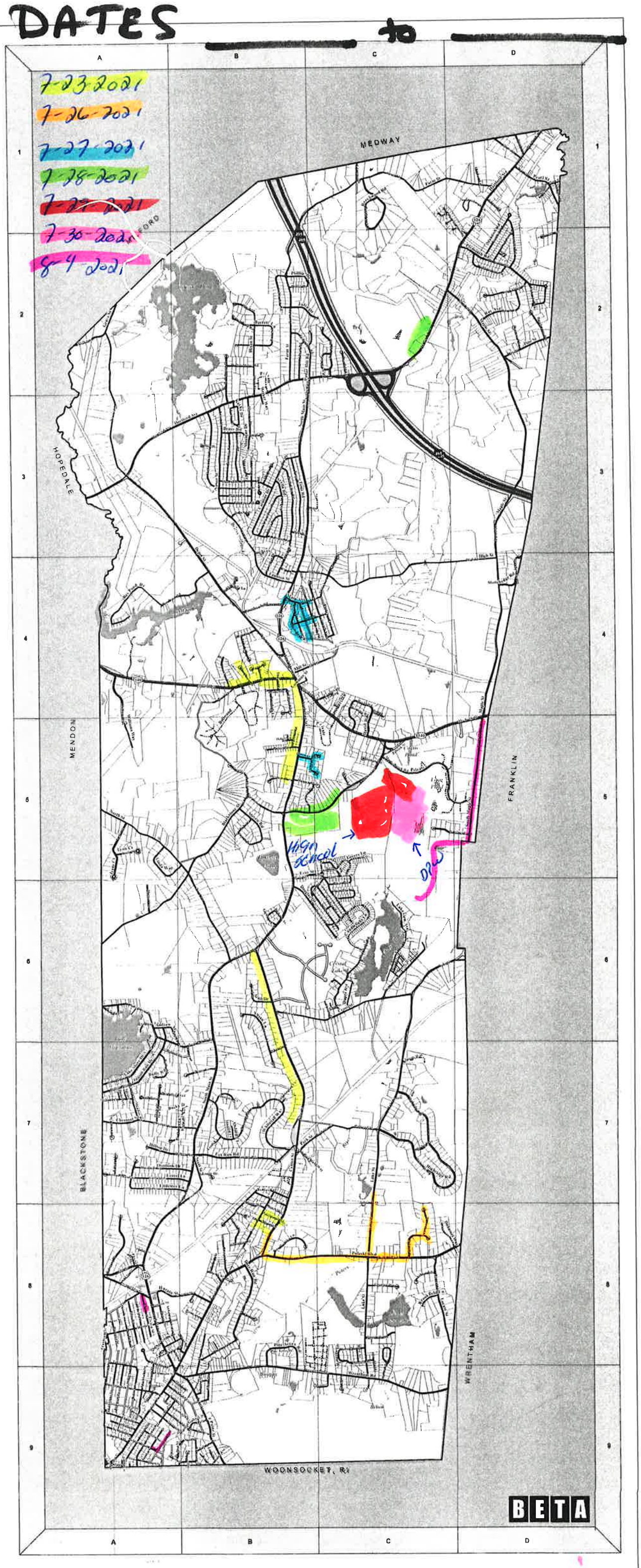
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Roma Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Ave.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Shalla Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Stevan Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln.	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Walker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3



SWEEPING DATES ____ to ____

Town of Bellingham, Massachusetts *Street Map*

Legend

- Parcels
- Water Bodies

0 0.225 0.45 Miles

1 inch = 1,500 feet

Roadway Ownership

- Town
- State
- Private
- Cemetery

This map is intended to support the inventory of real property of the Town of Bellingham. Map data should not be interpreted as the actual field survey data. This data should not be used for legal description or conveyance purposes.

Date: March 2020

Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-8
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrell Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Bertine St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarance Rd.	B-3
Cliff Rd.	C-3
Cederre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-5
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleuelle Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
Fox Run Rd.	B-7
Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-6
Garden St.	A-9
Gateway Rd.	B-5
Gemmur Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Kay St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-8
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
Link St.	B-9
Linwood Av.	A-9
Lisa Anne Dr.	B-3
Littlelree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
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Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
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South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
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Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Terri Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
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Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
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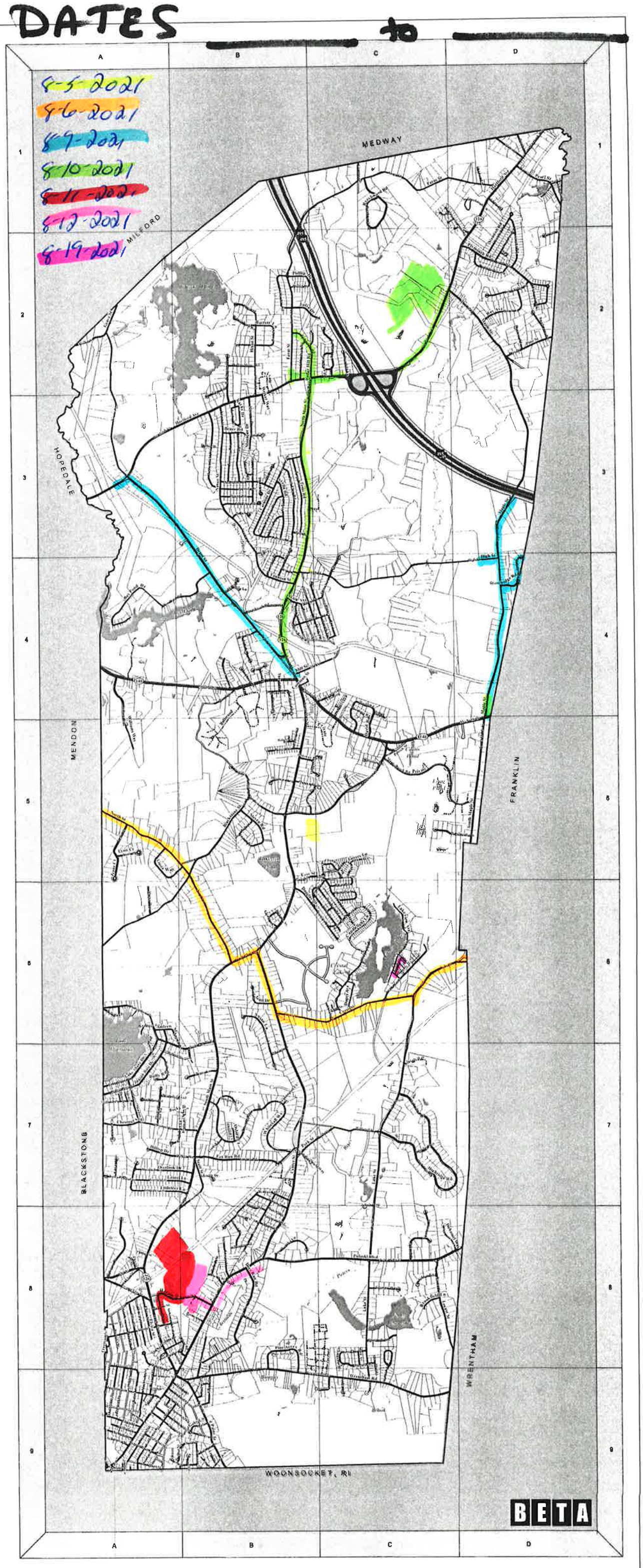

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Town of Bellingham, Massachusetts *Street Map*

Legend

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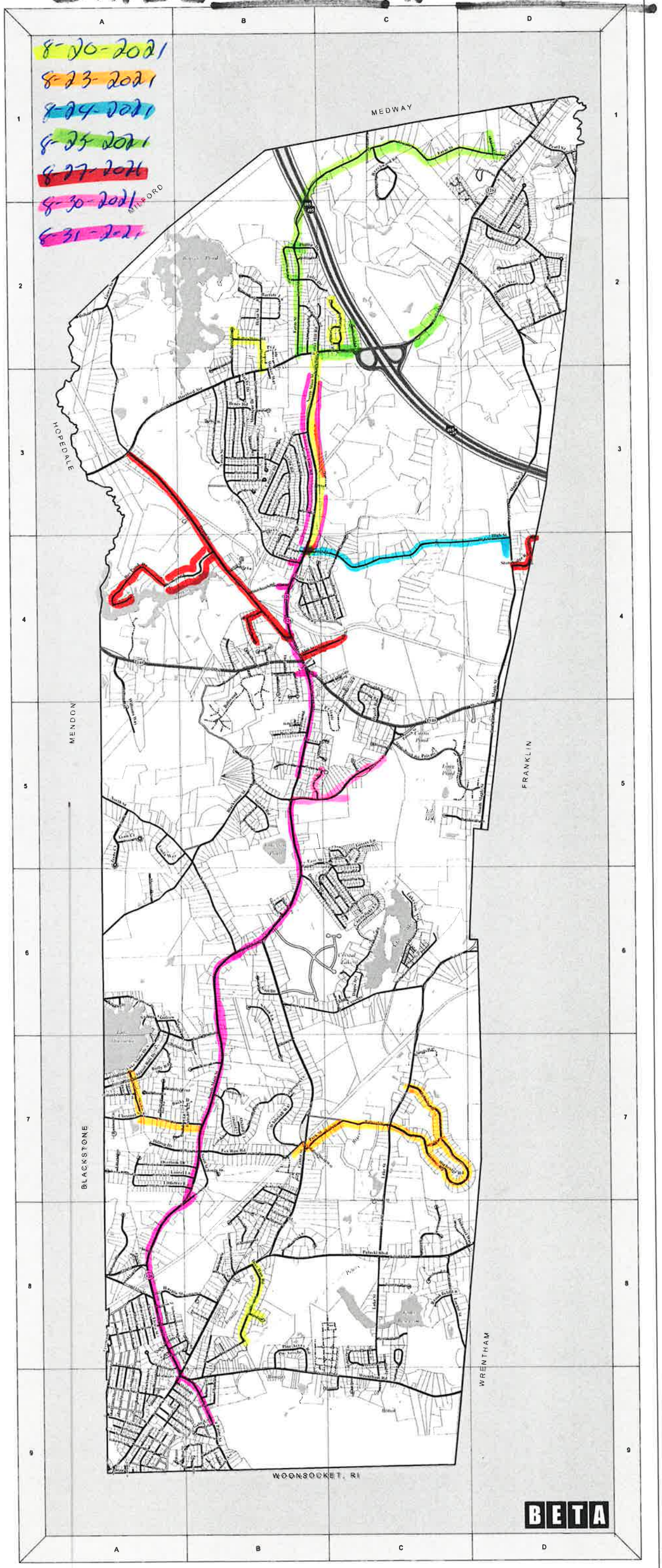

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Bellstone Dr.	A-8
Benelli St.	A-9, B-9
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Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
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Carrier St.	A-9
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Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
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Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
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Cooks Lane	A-9
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Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
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Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
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Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleuette Dr.	B-7
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Florida Av.	A-9
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Harper Blvd.	B-5
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Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
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Jamie Dr.	B-4
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Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
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Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
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Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-8
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
Link St.	B-9
Linwood Av.	A-9
Lisa Anne Dr.	B-3
Littletree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marlon Rd.	C-5
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Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
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Monique Dr.	B-2, B-3
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Nason St.	B-2, B-3
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North Center St.	B-5, C-5
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Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3

SWEEPING DATES to

Town of Bellingham, Massachusetts *Street Map*

9-1-2021

9-3-2021

Legend

- Parcels
- Water Bodies

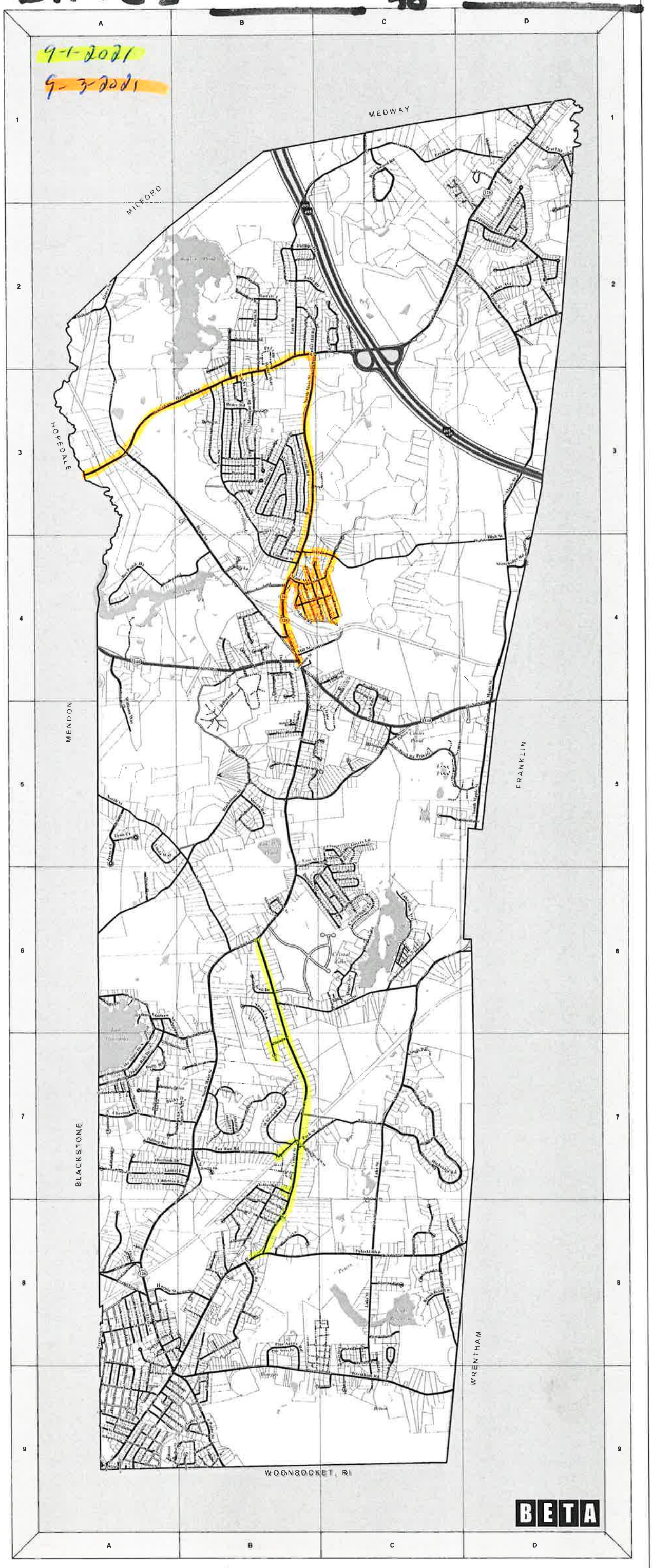
Roadway Ownership
- Town
- State
- Private
- Cemetery

0 0.225 0.45 Miles

1 inch = 1,500 feet

This map is intended to support the inventory of real property of the Town of Bellingham. Map data should not be interpreted as the actual field survey data. This data should not be used for legal description or conveyance purposes.

Date: March 2020



Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-8
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Bertine St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleuette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
Fox Run Rd.	B-7
Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-6
Garden St.	A-9
Gateway Rd.	B-5
Gemmur Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-8
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
ink St.	B-9
inwood Av.	A-9
isa Anne Dr.	B-3
ittletree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Shella Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
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Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3

SWEEPING DATES ____ to ____

Town of Bellingham, Massachusetts
Street Map

9-10-2021
9-13-2021
9-14-2021
9-15-2021
9-16-2021
9-20-2021

Legend

- Parcels
- Water Bodies

0 0.225 0.45 Miles

1 inch = 1,500 feet

Roadway Ownership

- Town
- State
- Private
- Cemetery

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Date: March 2020

Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-8
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Berlino St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brien Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
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Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Carolina Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
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Depot St.	A-3, B-3, B-4
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Dorothy Ave.	C-6
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Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleurette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
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Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-6
Garden St.	A-9
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Gemmur Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
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I-495	B-1, B-2, C-2, C-3, D-3
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Jamie Dr.	B-4
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Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Kay St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
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Lemire Ct.	B-9
Liberty St.	B-8
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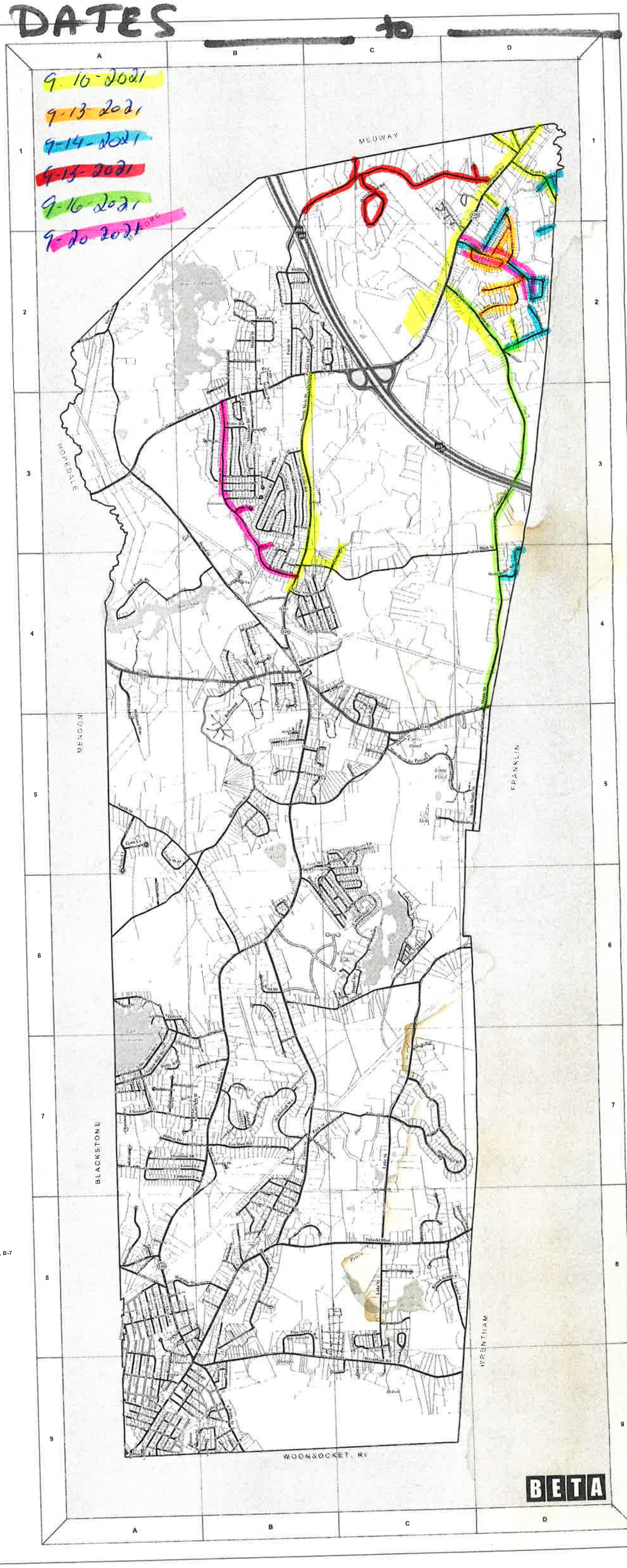
Linda Way	A-5, B-5
ink St.	B-9
inwood Av.	A-9
isa Anne Dr.	B-3
ittletree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-8, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-5, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3



SWEEPING DATES to

Town of Bellingham, Massachusetts *Street Map*

Legend

Parcels

Water Bodies

Roadway Ownership

- Town
- State
- Private
- Cemetery

0 0.225 0.45 Miles

1 inch = 1,500 feet

This map is intended to support the inventory of real property of the Town of Bellingham. Map data should not be interpreted as the actual field survey data. This data should not be used for legal description or conveyance purposes.

Date: March 2020

9-21-2021
9-22-2021
9-27-2021
9-28-2021
9-29-2021
9-30-2021

MEDWAY
MILFORD
HOPEDALE
MENDON
FRANKLIN
BLACKSTONE
WRENTHAM
WOONSOCKET, RI

Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-8
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Berline St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-8, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleuette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
Fox Run Rd.	B-7
Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-6
Garden St.	A-9
Gateway Rd.	B-5
Gemmer Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-8
Lilly Pad Ln.	B-6
Linda Way	A-5, B-5
Link St.	B-9
Linwood Av.	A-9
Lisa Anne Dr.	B-3
Littlefree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Manslon St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-3
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Palne St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squirrel Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morso Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3

BETA

SWEEPING DATES to

Town of Bellingham, Massachusetts *Street Map*

10-5-2021
10-6-2021
10-7-2021
10-13-2021
10-15-2021
10-18-2021

Legend

- Parcels
- Water Bodies

0 0.225 0.45 Miles

1 inch = 1,500 feet

Roadway Ownership

- Town
- State
- Private
- Cemetery

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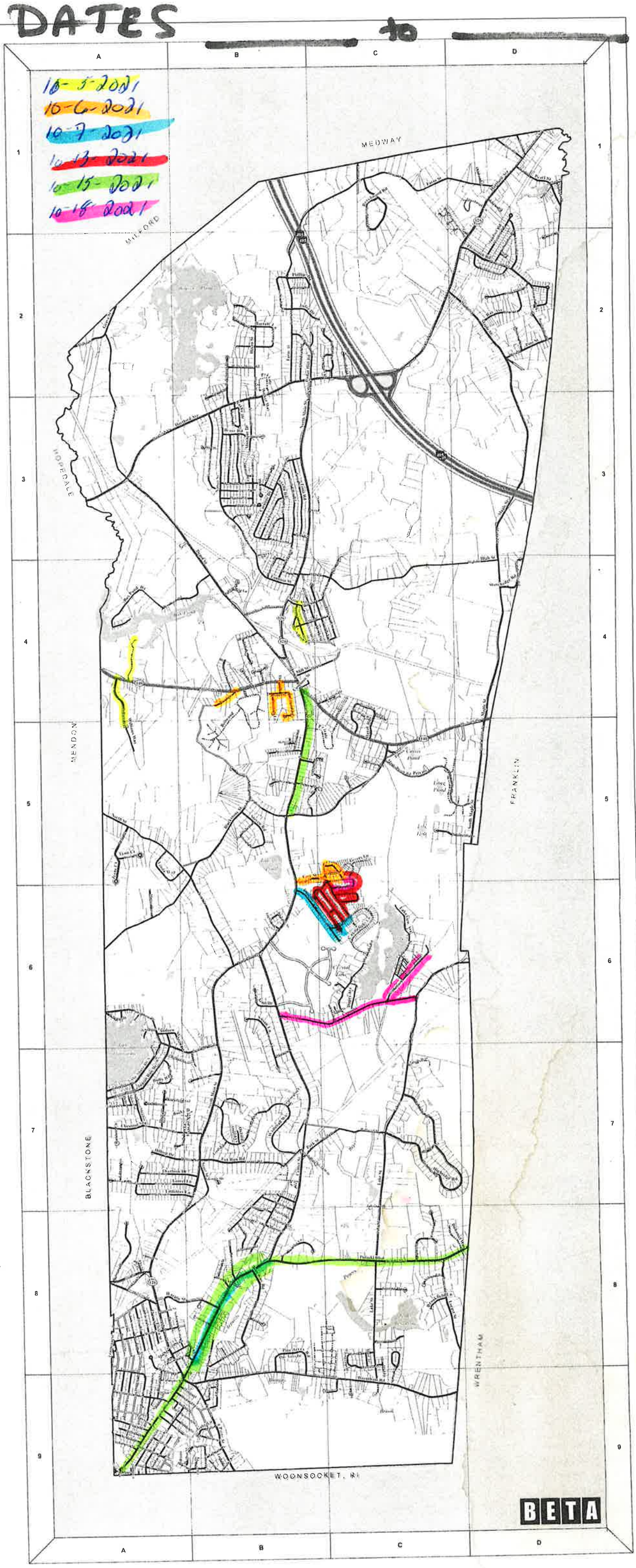
Date: March 2020

Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-8
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Bertine St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleuette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
Fox Run Rd.	B-7
Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-6
Garden St.	A-9
Gateway Rd.	B-5
Gemmur Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-6
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
Link St.	B-9
Linwood Av.	A-9
Lisa Anne Dr.	B-3
Littletree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-6
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-6
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Teml Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3



SWEEPING DATES to

Town of Bellingham, Massachusetts *Street Map*

Legend

- Parcels
- Water Bodies

Roadway Ownership

- Town
- State
- Private
- Cemetery

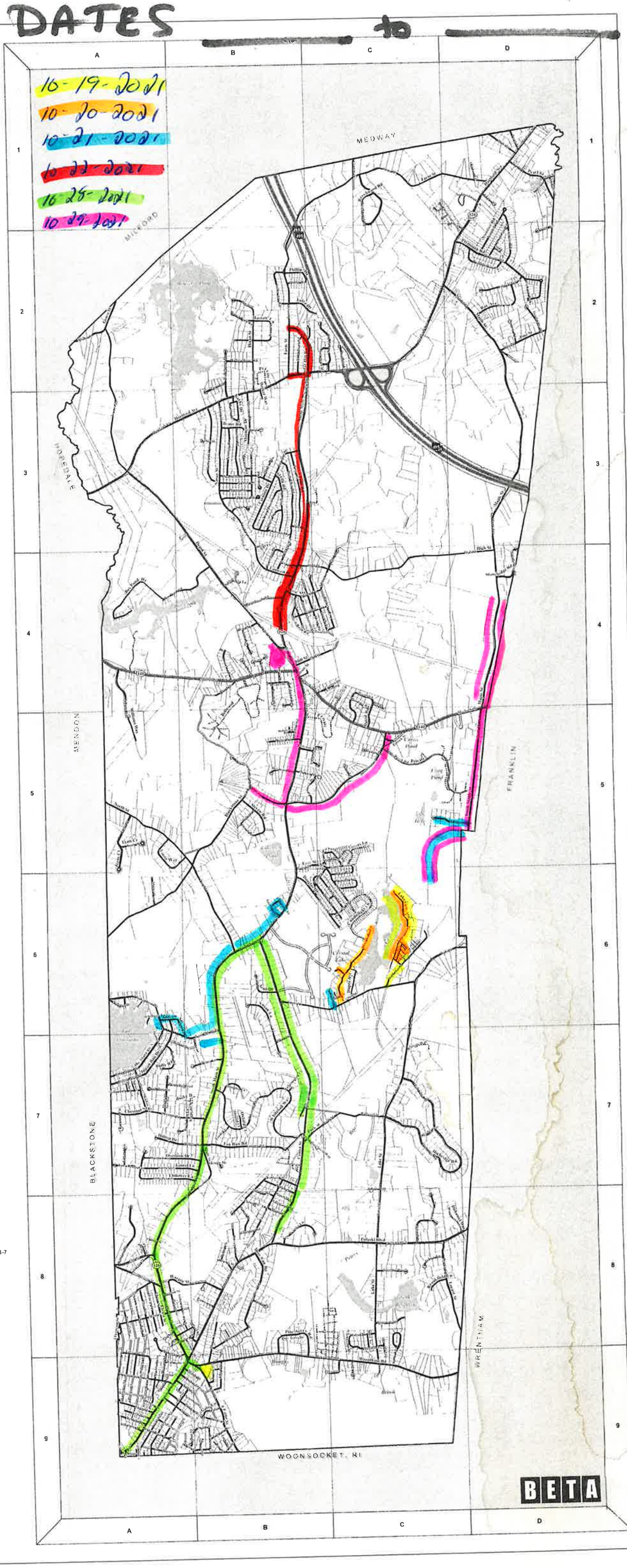
0 0.225 0.45 Miles

1 inch = 1,500 feet

This map is intended to support the inventory of real property of the Town of Bellingham. Map data should not be interpreted as the actual field survey data. This data should not be used for legal description or conveyance purposes.

Date: March 2020

10-19-2021
10-20-2021
10-21-2021
10-22-2021
10-25-2021
10-29-2021



Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-8
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Bertine St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Carywille Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleuette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
Fox Run Rd.	B-7
Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-6
Garden St.	A-9
Gateway Rd.	B-5
Gemmur Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-6
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Kay St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-8
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
ink St.	B-9
inwood Av.	A-9
Isa Anne Dr.	B-3
'tletree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stensen St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
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Swan Path	B-6
Taunton St.	B-3, B-4
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Victor St.	C-6
Vina St.	B-6, C-6
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Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3

SWEEPING DATES ____ to ____

Town of Bellingham, Massachusetts *Street Map*

11-2-2021
11-3-2021
11-4-2021
11-5-2021
11-8-2021
11-15-2021

Legend

- Parcels
- Water Bodies

0 0.225 0.45 Miles

1 inch = 1,500 feet

Roadway Ownership

- Town
- State
- Private
- Cemetery

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Date: March 2020

Acorn St.	A-9, B-9
Adam Ave.	C-6
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Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
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Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
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Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Bertine St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
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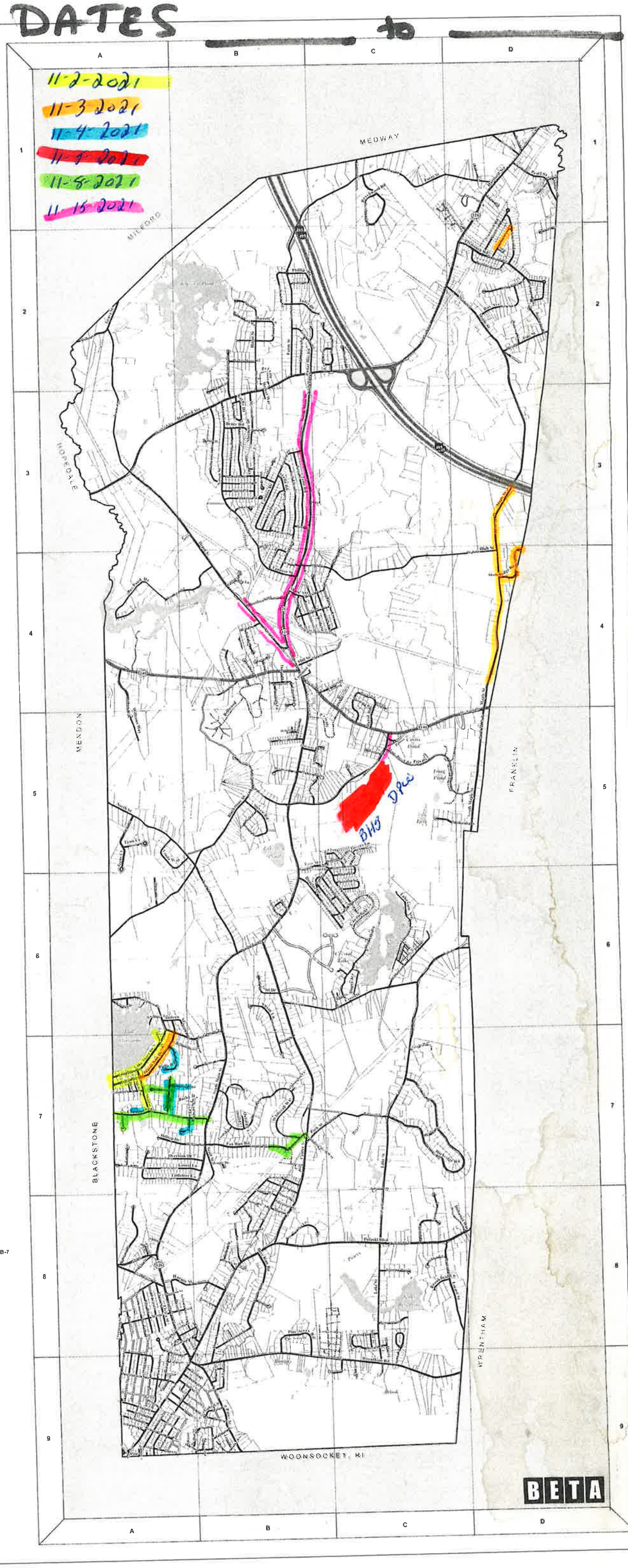
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-6
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleurette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
Fox Run Rd.	B-7
Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-6
Garden St.	A-9
Gateway Rd.	B-5
Gemmur Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-8
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
Ink St.	B-9
Inwood Av.	A-9
Isa Anne Dr.	B-3
Littletree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3



SWEEPING DATES to

Town of Bellingham, Massachusetts *Street Map*

11-16-2021
11-18-2021
11-22-2021
11-23-2021
11-24-2021
11-29-2021

Legend

Parcels

Water Bodies

0 0.225 0.45 Miles

1 inch = 1,500 feet

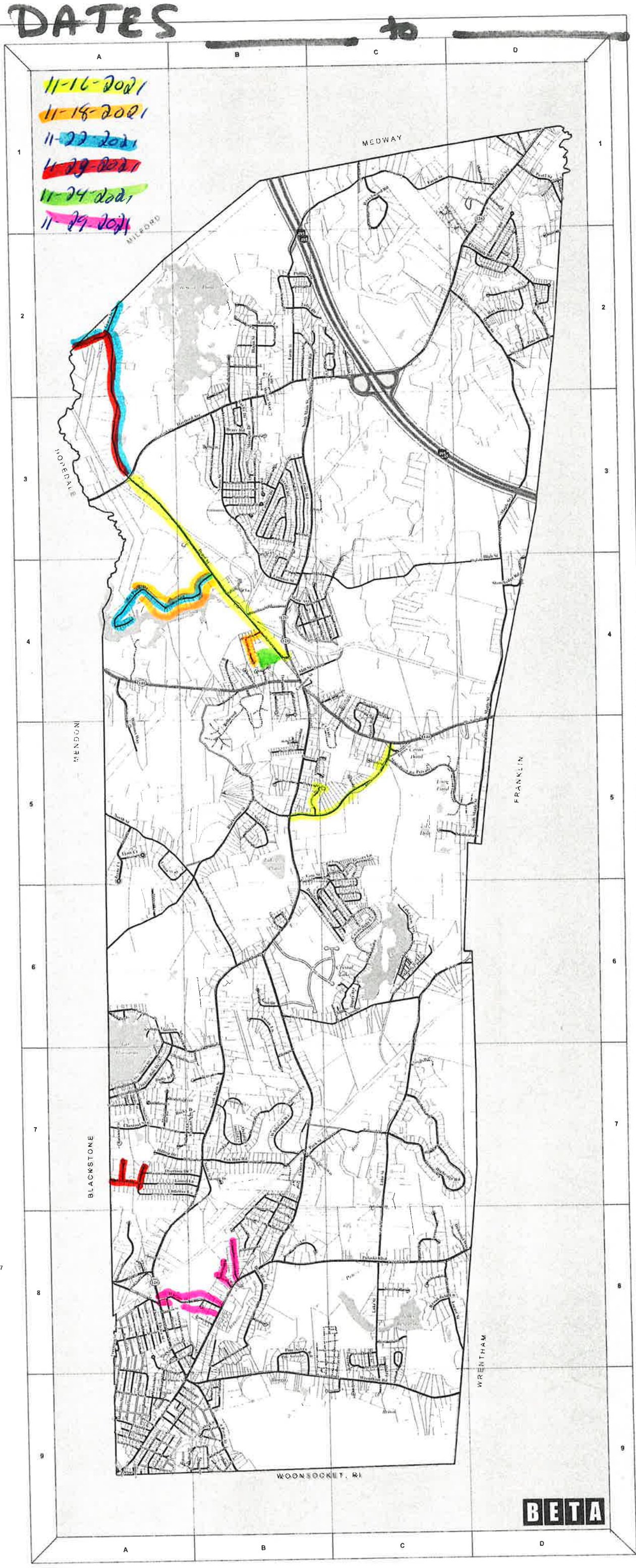
Roadway Ownership

- Town
- State
- Private
- Cemetery

This map is intended to support the inventory of real property of the Town of Bellingham. Map data should not be interpreted as the actual field survey data. This data should not be used for legal description or conveyance purposes.

Date: March 2020

Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-6
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Bertine St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-6
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-6
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fouette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
Fox Run Rd.	B-7
Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-6
Garden St.	A-9
Gateway Rd.	B-5
Gemmur Ln.	C-6
Geordan Av.	B-6, C-6
Glen St	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-8
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
ink St.	B-9
inwood Av.	A-9
isa Anne Dr.	B-3
ittletree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Manston St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Milli St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-6, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehenge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Walker Way	B-2
Westminster St.	A-9
Wathersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3



SWEEPING DATES to

Town of Bellingham, Massachusetts *Street Map*

Legend

- Parcels
- Water Bodies

0 0.225 0.45 Miles

1 inch = 1,500 feet

Roadway Ownership
- Town
- State
- Private
- Cemetery

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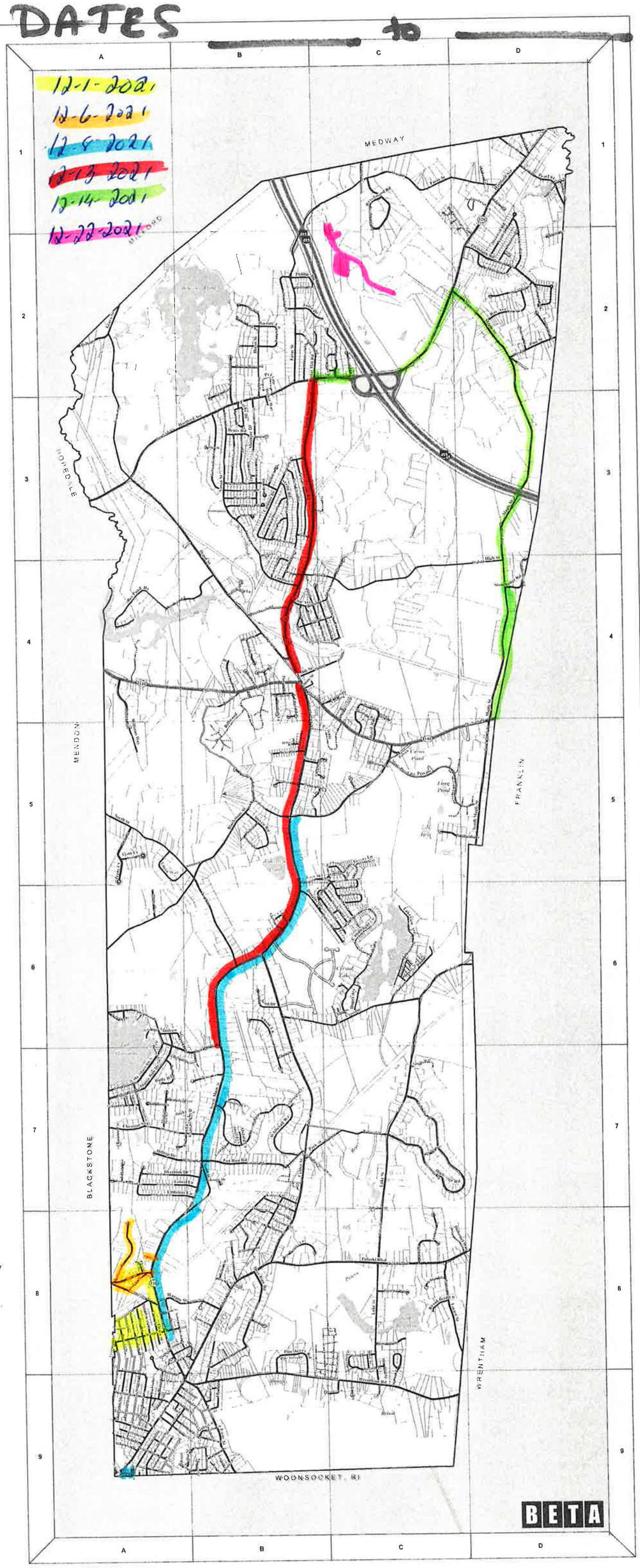
Date: March 2020

Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-8
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Bertine St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleuette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
Fox Run Rd.	B-7
Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-5
Garden St.	A-9
Gateway Rd.	B-5
Gemmur Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-8
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
ink St.	B-9
inwood Av.	A-9
isa Anne Dr.	B-3
ittletree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3



SWEEPING DATES ____ to ____

Town of Bellingham, Massachusetts *Street Map*

Legend

- Parcels
- Water Bodies

0 0.225 0.45 Miles

1 inch = 1,500 feet

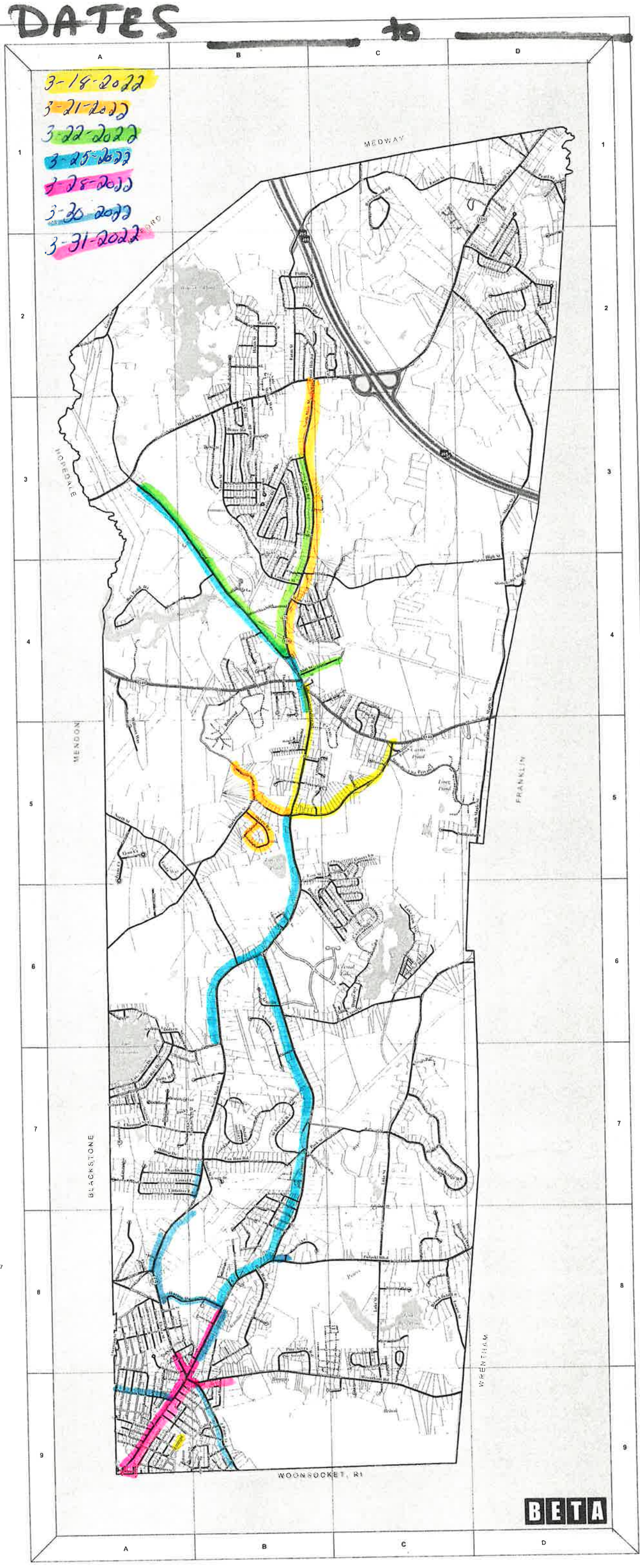
Roadway Ownership
- Town
- State
- Private
- Cemetery

This map is intended to support the inventory of real property of the Town of Bellingham. Map data should not be interpreted as the actual field survey data. This data should not be used for legal description or conveyance purposes.

Date: March 2020

Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-8
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Bertine St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-4
David Rd.	B-8
Debra Ln.	C-4, C-5
Deer Run Rd.	C-5
Deerfield Ln.	B-8, B-9
Denault Dr.	C-2
Depot St.	C-8
Donna Rd.	A-3, B-3, B-4
Dorothy Ave.	B-3
Douglas Dr.	C-6
Driftwood Valley Rd.	B-6, C-6
Dube Ave.	B-6
Duhamel Way	A-7
Dupre Ave.	C-8
Easy St.	C-6
Edgehill Ln.	B-5, B-6
Edgewood Rd.	B-4
Edward Cir.	B-8
Elaine Cir.	A-7
Elbow St.	B-8
Elm St. Rear	B-9
Elm St.	A-8
Elvira St.	A-8
Empire Cir.	A-8, A-9
Essex St.	A-9
Fairway Dr.	A-9
Farm St.	B-9
Fifth Ave Extension	B-1, B-2, C-1, D-1
Fifth Ave.	B-4, C-4
First Ave.	B-4, C-3, C-4
Flagg Dr.	B-4
Fleetwood Rd.	B-5
Fleuette Dr.	B-6
Florence St.	B-7
Florida Av.	C-6
Fourth Ave. Extension	A-9
Fourth Ave.	B-3
Fox Run Rd.	B-3, B-4
Freeman St.	B-7
Gaby Ln.	A-9
Gail Dr.	A-9, B-9
Garden St.	B-6
Gateway Rd.	A-9
Gemmur Ln.	B-5
Geordan Av.	C-8
Glen St.	B-6, C-6
Glenbrook Av.	A-8, A-9
Governor Av.	B-6
Granite St.	A-9
Grove St.	C-1
Hampton Ct.	A-2, A-3
Harper Blvd.	B-7
Harpin St.	B-5
Hartford Ave.	A-8, B-8
Heritage Way	A-2, A-3, B-2, C-1, C-2, D-1
High St.	B-5
Highland Rd.	B-3, C-3, C-4, D-3
Highridge Rd.	A-9
Hilltop Dr.	C-7, C-8
Hixon St.	A-7, B-7
Holman St.	B-2
Holmstrom Rd.	B-4
Horseshoe Dr.	B-5
Hunt St.	B-3, B-4
I-495	A-9
Indian Run Rd.	B-1, B-2, C-2, C-3, D-3
Irene Ct.	A-7
Irving St.	A-5
James St.	B-9
Jamie Dr.	B-6, C-6
Janet St.	B-4
Joannine Rd.	C-9
Jefferson Pl.	B-3
John Alden Cir.	B-3, C-3
John's Way	D-2
Joseph Cir.	C-8
Joseph Rosenfield Way	D-1
Joyce Ln.	B-7
Judy Ln.	B-2
Julia Dr.	B-4
Kathy Dr.	B-2, C-2
Kennedy Rd.	B-2, B-3
Kensington Ct.	B-5
Key St.	B-7
Lafayette St.	B-9
Lake Shore Dr.	A-9
Lake St.	A-6, A-7
Lakeview St. C	C-6, C-7, C-8, C-9
Laurel Lane Ext.	C-6
Laurel Ln.	A-7
Lawrence St.	A-7, A-8
Leeds Ln.	A-9
Lemire Ct.	B-7
Liberty St.	B-9
Lily Paul Ln.	B-8
Linda Way	B-6
ink St.	A-5, B-5
inwood Av.	B-9
isa Anne Dr.	A-9
ittletree Ln.	B-3
	A-7, A-8

Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Manslon St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern LIghts Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Phoasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberts Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Shella Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Clr.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Trapeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3



GIS

SWEEPING DATES ____ to ____

Town of Bellingham, Massachusetts *Street Map*

Legend

- Parcels
- Water Bodies

0 0.225 0.45 Miles

1 inch = 1,500 feet

Roadway Ownership

- Town
- State
- Private
- Cemetery

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Date: March 2020

Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-8
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Berline St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-6
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleuette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
Fox Run Rd.	B-7
Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-6
Garden St.	A-9
Gateway Rd.	B-5
Gemmur Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-8
Lilly Pad Ln.	B-6
Linda Way	A-5, B-5
Ink St.	B-9
Inwood Av.	A-9
Isa Anne Dr.	B-3
ittletree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
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Oak Terrace	A-8, A-9
Oak Terrace West	A-9
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Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Papor St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pellatier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-6
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
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Porter Rd.	B-3
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Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
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Rhodes Way	C-7
Richard Av.	B-6
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River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
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Rockland Cir.	A-7
Roger St.	B-7
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Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
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Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-6
Teml Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
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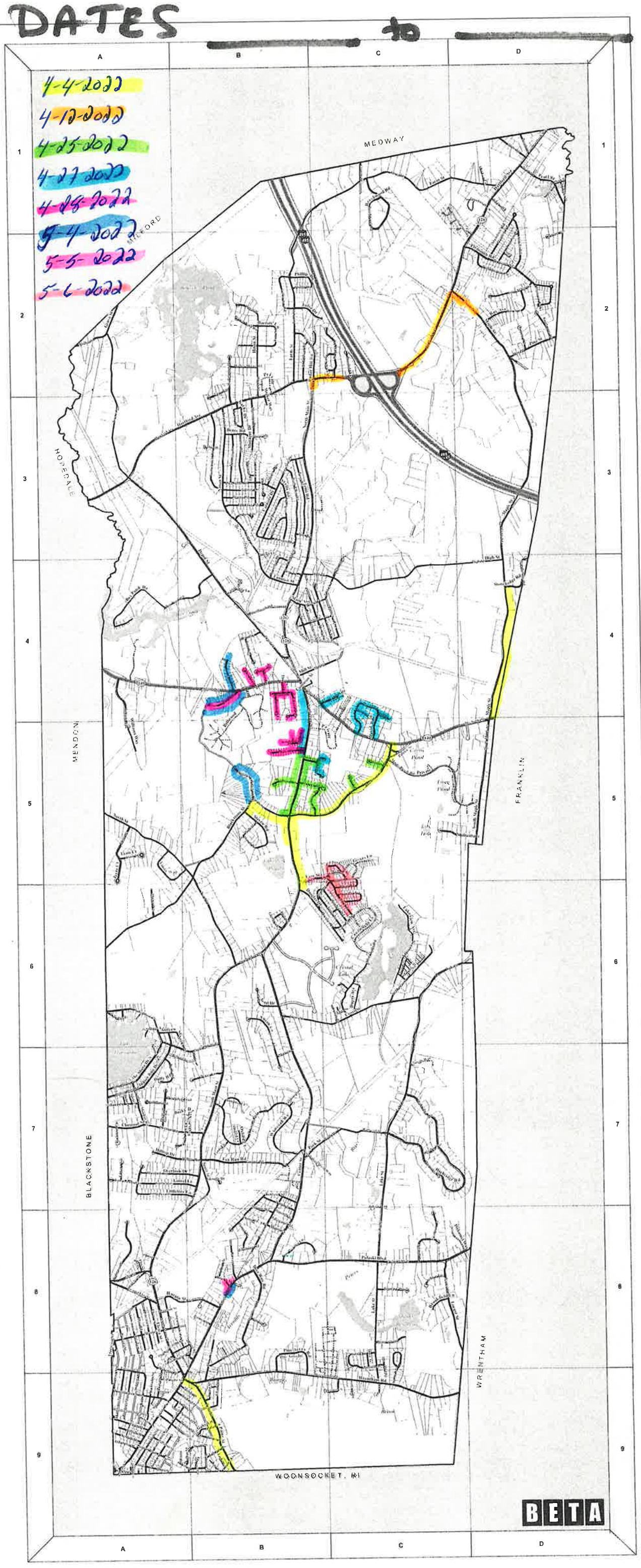

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Elvira St.	A-8, A-9
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Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
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High St.	B-3, C-3, C-4, D-3
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Highridge Rd.	C-7, C-8
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Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
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Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
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Kensington Ct.	B-7
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Lafayette St.	A-9
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Lakeview St. C	C-6
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Liberty St.	B-8
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
ink St.	B-9
Inwood Av.	A-9
lsa Anne Dr.	B-3
ittletree Ln.	A-7, A-8
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Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Palne St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
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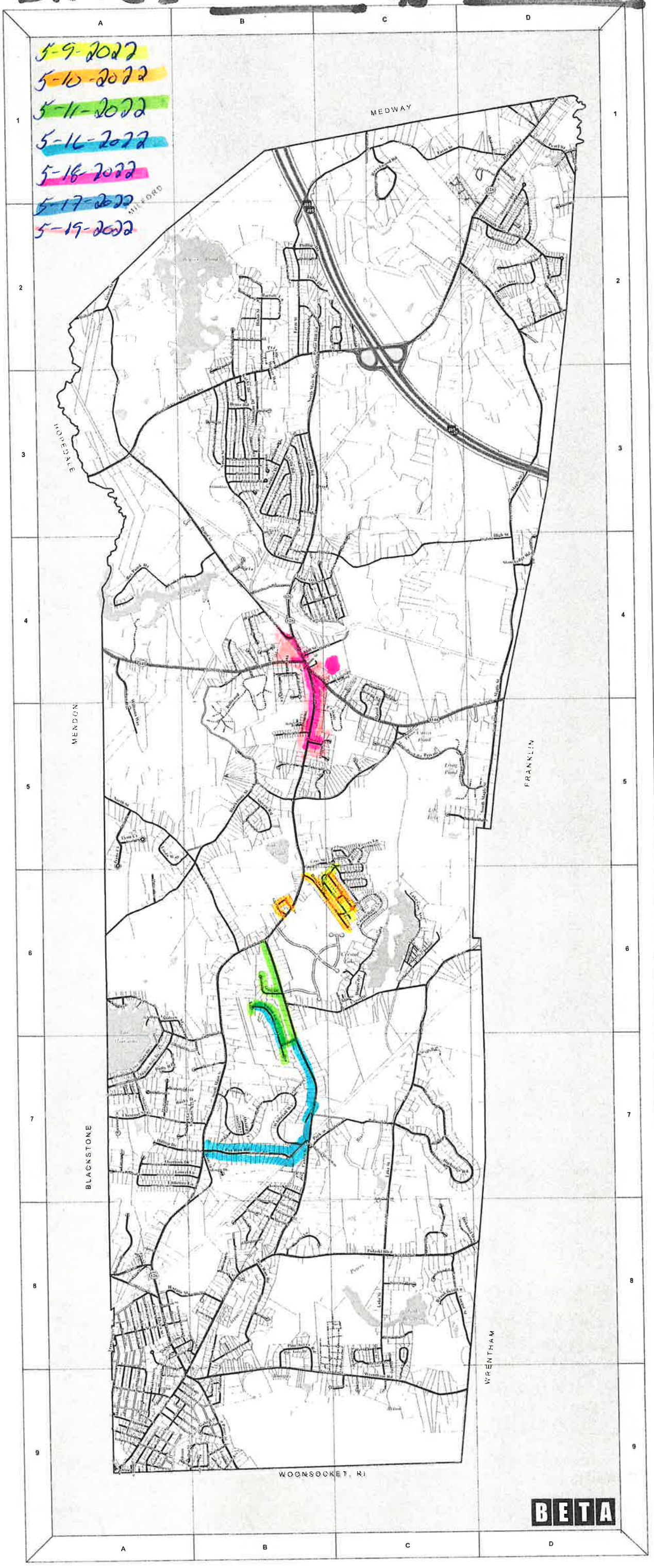
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehendge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3



SWEEPING DATES to

5-20-2022
5-23-2022
5-24-2022
5-25-2022
5-31-2022
6-1-2022

Town of Bellingham, Massachusetts *Street Map*

Legend

Parcels

Water Bodies

0 0.225 0.45 Miles

1 inch = 1,500 feet

Roadway Ownership

Town

State

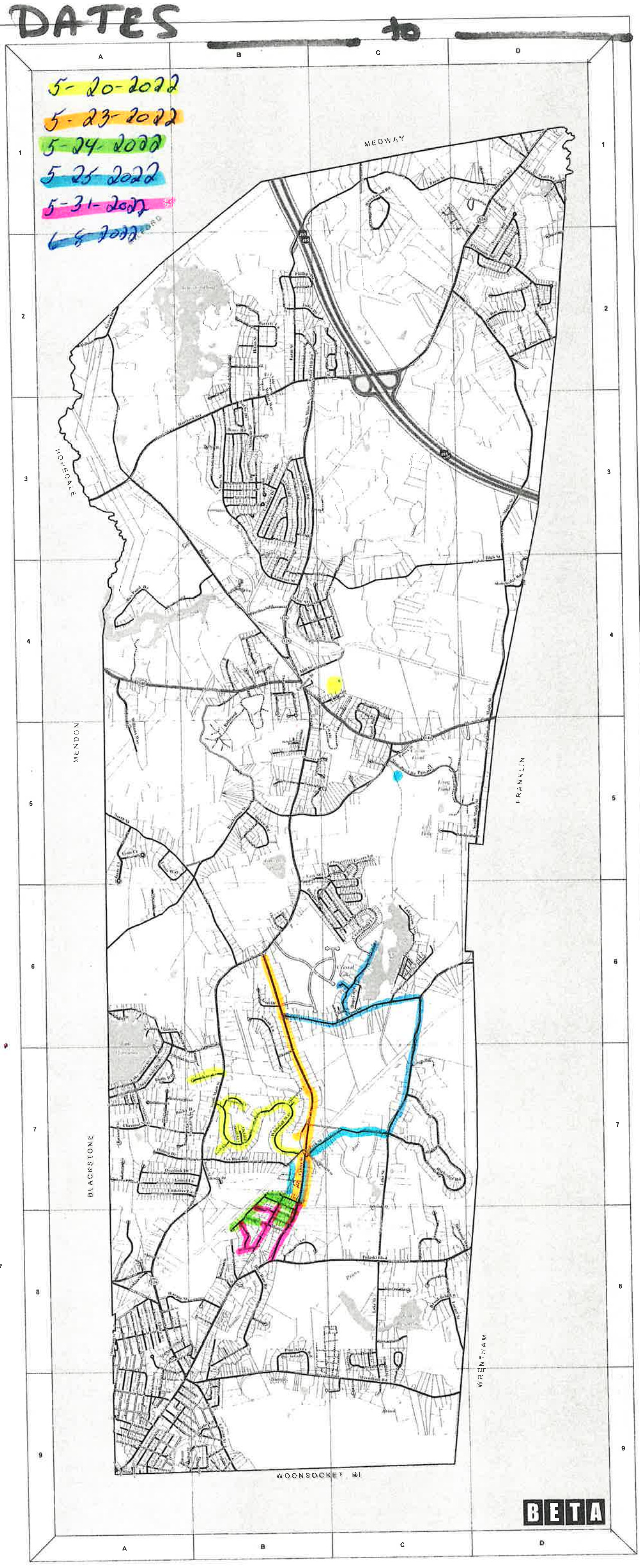
Private

Cemetery

This map is intended to support the inventory of real property of the Town of Bellingham. Map data should not be interpreted as the actual field survey data. This data should not be used for legal description or conveyance purposes.

Date: March 2020

Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-8
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Bertine St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleurette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
Fox Run Rd.	B-7
Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-6
Garden St.	A-9
Gateway Rd.	B-5
Gemmur Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-8
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
ink St.	B-9
inwood Av.	A-9
isa Anne Dr.	B-3
'ttlelree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehenge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Teml Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Tronton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3



SWEEPING DATES to

6-10-2022
6-15-2022
6-17-2022
6-22-2022
6-23-2022
6-27-2022

Town of Bellingham, Massachusetts *Street Map*

Legend

- Parcels
- Water Bodies

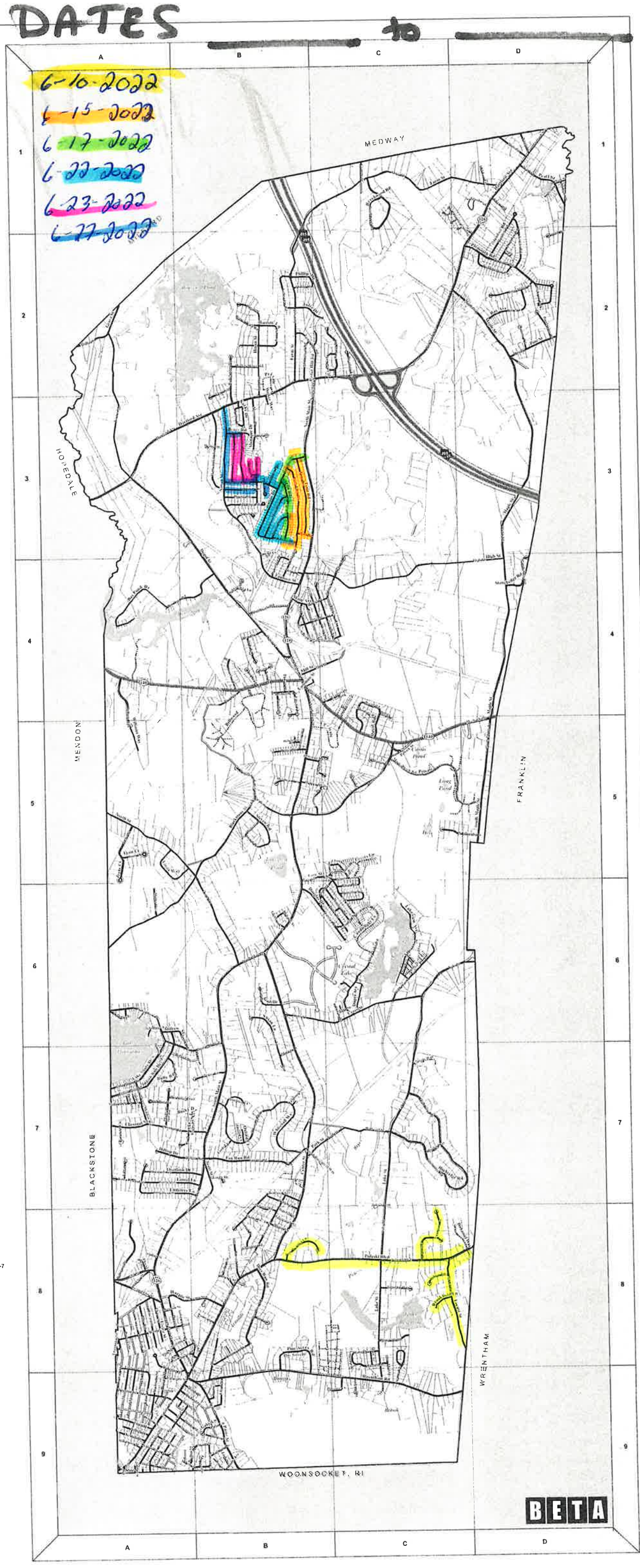
0 0.225 0.45 Miles

1 inch = 1,500 feet

Roadway Ownership
- Town
- State
- Private
- Cemetery

This map is intended to support the inventory of real property of the Town of Bellingham. Map data should not be interpreted as the actual field survey data. This data should not be used for legal description or conveyance purposes.

Date: March 2020



Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
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Arthur St.	A-9
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Autumn St.	A-9
Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Bertine St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-8
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleuette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
Fox Run Rd.	B-7
Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-6
Garden St.	A-9
Gateway Rd.	B-5
Gemmur Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-8
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
.ink St.	B-9
Inwood Av.	A-9
Isa Anne Dr.	B-3
'ittletree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marlon Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-8, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-8
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehenge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3

SWEEPING DATES to

6-28-2022
6-29-2022
6-30-2022
7-5-2022
7-11-2022
7-12-2022

Town of Bellingham, Massachusetts *Street Map*

Legend

- Parcels
- Water Bodies

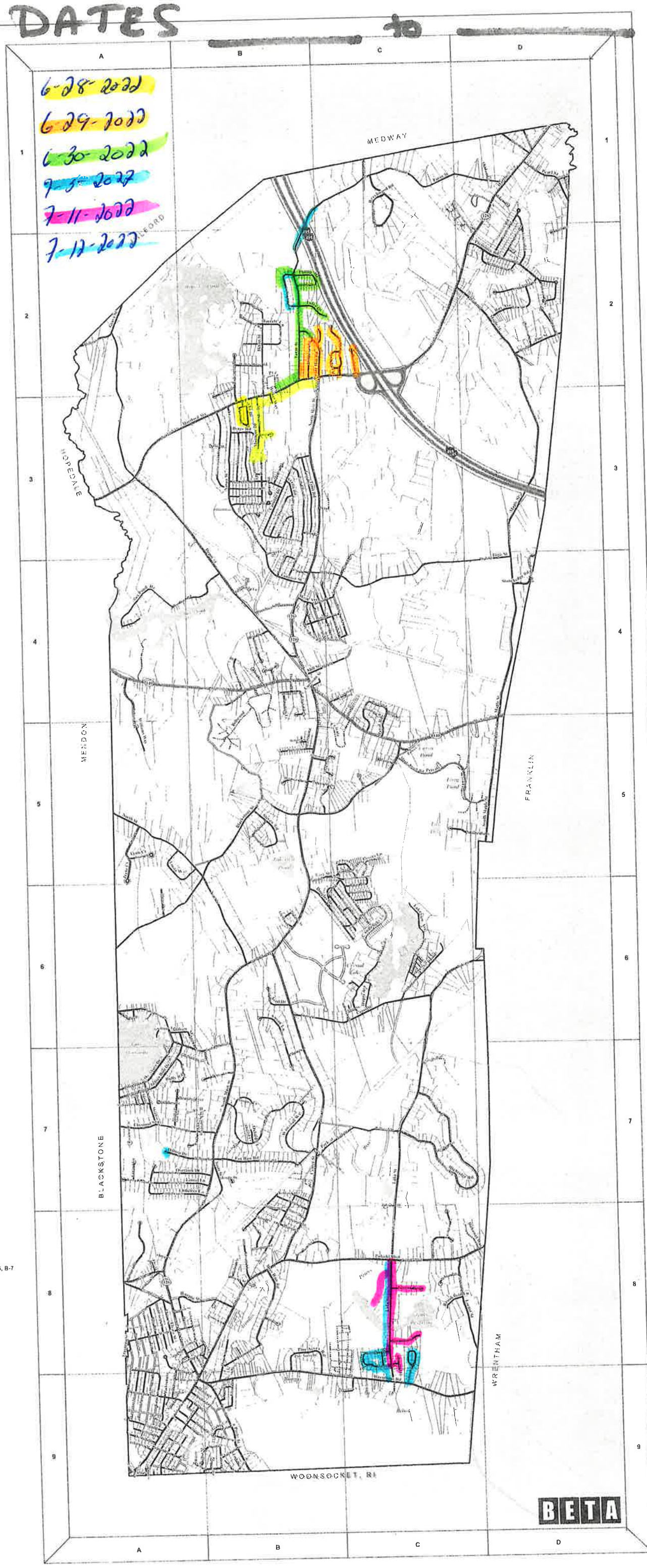
0 0.225 0.45 Miles

1 inch = 1,500 feet

Roadway Ownership
- Town
- State
- Private
- Cemetery

This map is intended to support the inventory of real property of the Town of Bellingham. Map data should not be interpreted as the actual field survey data. This data should not be used for legal description or conveyance purposes.

Date: March 2020



Acorn St.	A-9, B-9
Adam Ave.	C-6
Andrew St.	A-6, A-7
Andrews St.	A-9
Ann Marie Dr.	B-3
Apache Rd.	D-1
Arapahoe Rd.	D-1
Arbend Cir.	B-3
Archer St.	A-8
Arrowhead Rd.	B-2
Arthur St.	A-9
Atlanta Ave.	B-9
Auclair St.	A-9
Auger St.	A-8
Autumn St.	A-9
Bainbridge Rd.	D-2
Barrett Ln.	B-2
Beaver Pond Rd.	B-2
Beech St.	D-1
Beechwood Rd.	C-1
Bellingham St.	A-9
Bellstone Dr.	A-8
Benelli St.	A-9, B-9
Bernier Ln.	A-7
Bertine St.	C-6
Birch Tree Ln.	A-7
Blackmar Ext.	C-6
Blackmar St.	C-6
Blackstone St.	A-5, A-6, B-5, C-5
Bliss Rd.	A-8, A-9
Box Pond Rd.	A-4, B-3, B-4
Brion Rd.	B-6, C-5, C-6
Brisson St.	B-8
Brittany Rd.	D-2
Brook St.	B-4
Brookfield Lane	C-6
Brookside Ln.	B-4
Bruce Rd.	B-3
Bucky Dr.	A-7
Buffy Rd.	A-7
Cabot St.	A-9
California Ave.	A-9
Canale Dr.	B-6
Candace Dr.	B-5
Candlelight Ln.	C-6
Caroline Dr.	B-3
Carrier St.	A-9
Caryville Crossing	C-1
Cedar Hill Rd.	B-2
Celestial Cir.	C-5
Center St.	B-6, B-7, B-8
Centerville Ln.	B-4, C-4
Central Blvd.	A-9
Central St.	A-9
Chamberlain Rd.	B-5, C-5
Charlotte Rd.	C-4
Chase St.	D-1
Chestnut St.	A-7, B-7
Christine Rd.	B-8
Claire's Way	C-7
Clarence Rd.	B-3
Cliff Rd.	C-3
Coderre Dr.	C-9
Colonial Dr.	C-9
Common St.	B-4
Cooks Lane	A-9
Corsi St.	A-8
Country Way	C-8
Cranberry Meadow Rd.	A-7
Cross St.	B-6, C-6
Cutler St.	D-1
Cygnet Ln.	B-6
Dalmor Rd.	B-8
Damon Rd.	B-2
Daniel Dr.	B-8
David Rd.	C-4, C-5
Debra Ln.	C-5
Deer Run Rd.	B-8, B-9
Deerfield Ln.	C-2
Denault Dr.	C-8
Depot St.	A-3, B-3, B-4
Donna Rd.	B-3
Dorothy Ave.	C-6
Douglas Dr.	B-6, C-6
Driftwood Valley Rd.	B-6
Dube Ave.	A-7
Duhamel Way	C-8
Dupre Ave.	C-6
Easy St.	B-5, B-6
Edgehill Ln.	B-4
Edgewood Rd.	B-8
Edward Cir.	A-7
Elaine Cir.	B-8
Elbow St.	B-9
Elm St. Rear	A-8
Elm St.	A-8
Elvira St.	A-8, A-9
Empire Cir.	A-9
Essex St.	A-9
Fairway Dr.	B-9
Farm St.	B-1, B-2, C-1, D-1
Fifth Ave Extension	B-4, C-4
Fifth Ave.	B-4, C-3, C-4
First Ave.	B-4
Flagg Dr.	B-5
Fleetwood Rd.	B-6
Fleurette Dr.	B-7
Florence St.	C-6
Florida Av.	A-9
Fourth Ave. Extension	B-3
Fourth Ave.	B-3, B-4
Fox Run Rd.	B-7
Freeman St.	A-9
Gaby Ln.	A-9, B-9
Gail Dr.	B-6
Garden St.	A-9
Gateway Rd.	B-5
Gemmur Ln.	C-8
Geordan Av.	B-6, C-6
Glen St.	A-8, A-9
Glenbrook Av.	B-6
Governor Av.	A-9
Granite St.	C-1
Grove St.	A-2, A-3
Hampton Ct.	B-7
Harper Blvd.	B-5
Harpin St.	A-8, B-8
Hartford Ave.	A-2, A-3, B-2, C-1, C-2, D-1
Heritage Way	B-5
High St.	B-3, C-3, C-4, D-3
Highland Rd.	A-9
Highridge Rd.	C-7, C-8
Hilltop Dr.	A-7, B-7
Hixon St.	B-2
Holman St.	B-4
Holmstrom Rd.	B-5
Horseshoe Dr.	B-3, B-4
Hunt St.	A-9
I-495	B-1, B-2, C-2, C-3, D-3
Indian Run Rd.	A-7
Irene Ct.	A-5
Irving St.	B-9
James St.	B-6, C-6
Jamie Dr.	B-4
Janet St.	C-9
Jeannine Rd.	B-3
Jefferson Pl.	B-3, C-3
John Alden Cir.	D-2
John's Way	C-8
Joseph Cir.	D-1
Joseph Rosenfield Way	B-7
Joyce Ln.	B-2
Judy Ln.	B-4
Julia Dr.	B-2, C-2
Kathy Dr.	B-2, B-3
Kennedy Rd.	B-5
Kensington Ct.	B-7
Key St.	B-9
Lafayette St.	A-9
Lake Shore Dr.	A-6, A-7
Lake St.	C-6, C-7, C-8, C-9
Lakeview St. C	C-6
Laurel Lane Ext.	A-7
Laurel Ln.	A-7, A-8
Lawrence St.	A-9
Leeds Ln.	B-7
Lemire Ct.	B-9
Liberty St.	B-6
Lily Pad Ln.	B-6
Linda Way	A-5, B-5
Link St.	B-9
Inwood Av.	A-9
Isa Anne Dr.	B-3
Littletree Ln.	A-7, A-8
Lizotte Dr.	B-7, B-8
Locust St.	C-8, C-9
Lovers Ln.	C-5
Lowland Rd.	A-9
Lynn Ct.	A-5
Maddie Way	A-6
Main Ave.	B-4, C-4
Mann St.	A-8, A-9
Mansion St	A-8
Maple St.	C-2, D-2, D-3, D-4
Maple Brook Rd.	C-5
Marc Ave.	C-9
Marion Rd.	C-5
Mary St.	C-6
Mattie Way	A-6
Maureen Rd.	B-3
McKean St.	D-1
Meadow Rd.	A-9
Mechanic St.	B-4, C-4, C-5, D-4
Med St.	C-9
Mellen St.	A-2
Mendon St.	A-4, B-4
Middle Ave	B-4
Mill St.	B-4, C-4
Mohawk Path	D-2
Mohawk St.	A-7
Monique Dr.	B-2, B-3
Moody St.	A-9
Morin Dr.	B-8
Morrison St.	A-8
Muron Av.	B-9
Nason St.	B-2, B-3
Newland Av.	B-8
Norfolk St.	A-9
North Center St.	B-5, C-5
North Main St.	B-2, B-3, B-4
North St.	A-5, B-5, B-6
Northeast Dr.	B-4
Northern Lights Way	C-6
Oak St.	A-9
Oak Terrace	A-6, A-9
Oak Terrace West	A-9
Old Blackstone	C-5
Old Center St	B-7
Old Elm St.	A-8
Old Log Ln.	D-1
Orchard St.	A-9
Oswego St.	A-8, A-9
Otis St.	B-6, C-6
Overlook Dr.	A-7, B-7
Oxford Ct.	B-7
Paine St.	A-9, B-9
Paper St.	B-8
Park St.	B-7, C-7
Partridge Trail	A-7
Patricia Dr.	B-3
Patrick St.	C-5
Paul Rd.	B-3
Pearl St.	D-1
Pelletier Dr.	A-6
Penny Ln.	A-7, B-7
Pheasant Hill Rd.	A-7
Phillip Dr.	B-2
Pickering Av.	A-9
Pine St.	D-2
Pine Acres Rd.	A-8, A-9
Pine Grove Av.	B-9
Pine Warbler Ln.	B-8
Pinecrest Ct.	B-8
Plain St.	D-1
Pleasant St.	A-9
Plymouth Rd.	C-1, D-1, D-2
Poirier St.	A-8, B-8
Pond St.	B-6
Pony Ct.	B-3
Porter Rd.	B-3
Pothier St.	A-9
Potter Cir.	B-5
Potter Dr.	B-5
Prairie St.	B-6
Priscilla Av.	C-9
Prospect St.	A-9
Puddingstone Ln.	D-1, D-2
Pulaski Blvd.	A-9, B-8, B-9, C-8
Quail Run Rd.	A-7
R. Belanger Dr.	B-2
Railroad St.	B-7, C-7
Rakeville Cir.	C-9
Rawson Rd.	B-2, C-2
Ray Ave.	D-2
Reservoir Rd.	C-9
Rhodes Way	C-7
Richard Av.	B-6
Rita Ln.	B-4
River Bank Rd.	B-4, C-4
Riverbrook Rd.	B-4
Robbins Rd.	B-4
Robert Av.	A-7, B-8
Roberta Ln.	B-5
Rockland Cir.	A-7
Roger St.	B-7
Rolling Hill Rd.	C-4
Romano St.	A-8, A-9
Rome Av.	B-9
Rondeau Rd.	B-6, C-6
Rose Av.	B-4
Rose Ave Ext.	B-4
Roy St.	A-9
Russen Rd.	A-4
Ruth Ellen Rd.	B-3
Saddleback Hill Rd.	B-5
Sagamore Rd.	B-2, C-2
Sail Boat Way	B-6
Salisbury St.	A-9
Sandcastle Ln.	C-5
Saumur Ln.	A-6, A-7
Scott Hill Blvd.	A-7, B-7
Scott St.	A-8, B-7, B-8
Second Ave.	B-4
Sharon Av.	B-7
Sharpe Dr.	C-2
Sheila Dr.	B-3
Shirley Rd.	B-3
Short St.	B-5
Sidney Ln.	C-8
Silver Av.	B-5, B-6, C-6
Silver Lake Rd.	C-6
Sioux Cir.	D-1
South Center St.	B-6, C-5, C-6
South Main St.	A-7, A-8, A-9, B-4, B-5, B-6, B-7
South Maple St.	C-5, D-4, D-5
South Park St.	A-9
Spring St.	A-9
Spruce St.	A-7
Squire Ln.	C-9
Standish Rd.	D-1
Stella Rd.	B-3
Stenson St.	A-9
Steven Rd.	B-5
Stockholm St.	A-9
Stone St.	D-1
Stonehenge Rd.	D-3, D-4
Suffolk St.	A-9
Summer St.	A-9
Sunset Ct.	B-3
Susan Ln.	B-6, B-7
Swan Path	B-6
Taunton St.	B-3, B-4
Taylor Dr.	B-8
Temi Rd.	B-3
Thayer St.	B-4
Theresa Rd.	B-3
Third Ave.	B-4
Toni Dr.	B-4
Trenton St.	A-9
Tropeano Ct.	B-3
Twinbrook Ln	D-1
Valleyview Rd.	B-2
Victor St.	C-6
Vina St.	B-6, C-6
Walnut St.	A-9
Walter Morse Rd.	B-2
Water St.	B-3
Welker Way	B-2
Westminster St.	A-9
Wethersfield Rd.	B-2, B-3
Whitehall Way	B-7
Williams Way	A-4
Winter St.	A-9, B-9
Woodland Rd.	A-9
Woodside Ln.	B-4
Wrentham Rd.	A-9, B-9, C-9
Wrentham St.	A-9
Yvonne Rd.	B-3

Legal Analysis – Phase 1 PCP Components MA MS4 General Permit

TO: Don DiMaritno, Director of Public Works, Town of Bellingham

FROM: Emily Scerbo, PE, Senior Project Manager and Janet S. Moonan, PE, Project Manager

COPY: James Kupfer, MPA, AICP, Town Planner

DATE: June 30, 2020, *updated in January 2021 to reflect Stormwater Utility*

Tighe & Bond is providing this memorandum to document compliance with the "Legal Analysis" requirement of the U.S. Environmental Protection Agency's (EPA) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) in Massachusetts, specifically Appendix F Requirements for Discharges to Impaired Waters with an Approved Total Maximum Daily Load (TMDL), Part A. I. Charles River Watershed Phosphorus TMDL Requirements.

"Legal Analysis" Requirement

According to Appendix F, as part of developing and implementing a Phosphorus Control Plan (PCP) designed to reduce the amount of phosphorus in stormwater discharges from the MS4 to the Charles River and its tributaries, Bellingham must conduct an analysis of local legal authority that may be necessary to effectively implement the entire PCP (termed by EPA as a "legal analysis"). This analysis must be completed prior to June 30, 2020. A description of the Phase 1 PCP Legal Analysis, as stated in the MS4GP, reads as follows:

> *The permittee shall develop and implement an analysis that identifies existing regulatory mechanisms available to the MS4 such as bylaws and ordinances and describes any changes to regulatory mechanisms that may be necessary to effectively implement the entire PCP. This may include the creation or amendment of financial and regulatory authorities. The permittee shall adopt necessary regulatory changes by the end of the permit term.*

According to Appendix F, Section A.I.b., Phases 2 and 3 of the PCP will include an updated legal analysis as necessary, along with other efforts to complete structural and non-structural controls of phosphorus discharges from stormwater.

Tighe & Bond has prepared the Phase 1 PCP Legal Analysis to identify existing regulatory mechanisms available to the Town such as bylaws and regulations, any changes to regulatory mechanisms that may be necessary to effectively implement the entire PCP. The following includes a description of Bellingham's current legal authority to implement non-structural, structural and semi-structural phosphorus reduction actions on both public and private property and future changes that would be required to fully implement the PCP. The updated memorandum also considers the recently adopted Stormwater Utility, including potential benefits of the credit system for private properties, as well as the potential for EPA taking Residual Designation Authority (RDA) over private properties.

Legal Authority to Implement the PCP on Public Property

Current Authority

The Town of Bellingham has authority to undertake all structural and non-structural controls on public property. Public property consists of Town owned or operated parcels including parking

lots, as well as municipal roadways and the right of way. Bellingham can complete street sweeping, catch basin cleaning, and although not desired due to limited cost-effectiveness, an Organic Waste and Leaf Litter Collection program, both now and in the future. Bellingham has authority to install structural or semi-structural BMPs on Town-owned lands.

Changes Needed

There are no legal changes necessary to implement the PCP on public property. Requiring all new and redevelopment projects on public property to implement structural BMPs requires buy-in from municipal officials and planning for these efforts in capital and operational budgets.

Legal Authority to Implement the PCP on Private Property

Overview of Current Local Authority

In 2007, the Planning Board voted to accept revisions to their Regulations and Procedural Rules to add Erosion and Sedimentation Control requirements (see Section 7.7 and 7.8). The Zoning and Subdivision Bylaws reference the Planning Board Procedural Rules and thereby cover site development and redevelopment under the comprehensive Stormwater Management regulations and the Procedural Rules. Section 7.0 of the Procedural Rules includes construction and post-construction stormwater management requirements for new developments and redevelopments and aims to:

- Require practices to control the flow of stormwater from new and redeveloped sites into the Town storm drainage system in order to prevent flooding and erosion;
- Protect groundwater and surface water from degradation;
- Promote groundwater recharge;
- Prevent pollutants from entering Bellingham's MS4 and to minimize discharge of pollutants from the MS4;
- Ensure adequate long-term operation and maintenance of structural stormwater best management practices so that they work as designed;
- Comply with state and federal statutes and regulations relating to stormwater discharges; and
- Establish the town's legal authority to ensure compliance with the provisions of these regulations through inspection, monitoring, and enforcement.

If construction projects disturb one (1) or more acres, the Town requires the developer to submit an Erosion and Sediment Control Plan, Stormwater Management Plan, and Operation and Maintenance (O&M) Plan for approval. The Erosion and Sediment Control Plan includes the development of a Stormwater Pollution Prevention Plan if needed.

The Town ensures that proper erosion and sediment controls are maintained through their permitting process and site inspections during construction. The Town also inspects development and redevelopment projects for post-constructions stormwater control at the conclusion of the construction period. Developers are required to submit as-built plans of all structural stormwater controls and treatment best management practices at the site to the Town. The Town also requires that stormwater management easements are established to grant the Town sufficient access to all areas used for off-site stormwater control, and must be recorded on the property's deed.

Comments on Authority by Type of BMP

This analysis is organized by type of BMP under which phosphorus reduction credits can be obtained per the MS4 General Permit:

- Enhanced sweeping: Bellingham has no authority to physically sweep on private individual properties.
- Catch Basin Cleaning: Catch basin cleaning on private properties by a private entity can only be enforced under a local permit or Order of Conditions that requires catch basin cleaning through an O&M plan currently required through jurisdiction under the code descried above and/or Chapter 247 Wetlands Regulations of the Town Bylaws. This provision would typically be for new, deep sump catch basins installed in compliance with the Massachusetts Stormwater Handbook, not older or non-replaced basins on a project site.
- Organic Waste and Leaf Litter Collection program: Bellingham has no authority to require this work on private property; further, the Town has no control over the method of disposal on private individual properties. However, Bellingham's trash contractor does offer yard waste pickup of materials placed in paper biodegradable bags on Saturdays during the Spring and Fall.
- Structural BMPs[1]: Structural BMPs on private properties can be required through the local permitting process described above or through Chapter 247 Wetlands Regulations of the Town Bylaws.
- Semi-Structural BMPs[2]: There is limited opportunity to require semi-structural BMPs on private property through existing local controls.

Potential Incentive Created by Stormwater Utility Credit Policy

Bellingham began to consider enacting a stormwater utility in 2019 and completed initial evaluation of impervious area and potential fees described in the November 2019 memorandum titled "Bellingham Preliminary Impervious Area Calculations." As documented on the Town's website, the Selectboard placed an article on the November 13, 2019 Town Meeting Warrant to establish the Stormwater Management Enterprise Fund. After support by the Finance Committee, Town meeting voted to approve the Stormwater Enterprise Fund.

The initial Stormwater fee schedule was approved in early June 2020. The Stormwater utility budget was approved at the June 22, 2020 Town Meeting. The Stormwater Utility Fee Regulations and revised Stormwater Fee Schedule were accepted in late August 2020.

The Stormwater Utility Regulations provide a "credit" system that allows any private property owners that own, maintain, and operate on-site or off-site stormwater systems or facilities, or provides services or activities that reduce or mitigate the Town's cost of providing stormwater management services or assist the Town in achieving nutrient load reductions as required by the MS4 General permit to obtain a credit based on the technical and procedural criteria set forth in the Stormwater Utility Credit Policy. The credit policy, dated September 15, 2020, applies to large residential and non-residential properties and will be applied when the property

[1] Infiltration trench, Infiltration Basin or other surface infiltration practice, Bio-filtration Practice, Gravel Wetland System, Porous Pavement, Wet Pond or wet detention basin, Dry Pond or detention basin, Dry Water Quality Swale/Grass Swale

[2] Impervious Area Disconnection through Storage (e.g., rain barrels, cisterns, etc.), Impervious Area Disconnection, Conversion of Impervious Area to Permeable Pervious Area, and Soil Amendments to Enhance Permeability of Pervious Areas

owner successfully documents that the BMP they own and operate will achieve a phosphorus reduction. As of the date of this memorandum, the annual credit will amount to $500 per pound of phosphorus reduction per year and must be compared to the April 2005 Land Use baseline loading as certified by the professional engineering signing and stamping the application. Note that there is a maximum credit in fee reduction (80%) as well.

The intent of the credit system is to incentivize private properties to address phosphorus onsite to further help the Town of Bellingham achieve the total phosphorus reduction goals of the MS4 General Permit.

Consideration for RDA

The previous iteration of EPA's RDA permit called for individual Designated Discharges (DDs) located in Bellingham, Franklin, and Milford to reduce their total phosphorus loads by 65% from existing conditions. DDs include sites with two or more acres of impervious surface. At that time, there were 40 DDs in Bellingham (a total of 281.3 acres of impervious area in the Charles River watershed in Town).

This permit put the burden of a portion of the Town's total phosphorus reduction on specific properties and private development/redevelopment, which would have helped the Town achieve the total phosphorus load reduction but also would have had significant impacts on the local economy and businesses.

Bellingham must achieve a Phase 1 PCP Load Reduction of 161 lb/year within the Urbanized Area. Based on calculations presented in the June 30, 2018, letter report titled "Technical Review of EPA's Small Municipal Separate Storm Sewer Systems (MS4) General Permit Phosphorus Control Plan Obligations for the Town of Bellingham", the Town itself, with available municipal land (not including public roadways), may only be able to remove approximately 40 to 45 lbs/year with structural BMPs (about 27% of the Phase 1 PCP Reduction Requirement). **Given these ballpark calculations, the Town of Bellingham will not likely be able to achieve the total Phase 1 PCP Reduction without the help from private parcels or without significant roadway retrofits.**

The new iteration of RDA, in progress, has EPA in a Petition Review and Stakeholder Engagement Process to consider what makes logical sense to regulate in the watershed and how a permit will be structured.

While RDA is controversial and has ramifications for the Town's economy and local business presence, without RDA it is unlikely Bellingham will ever achieve the full phosphorus reduction required by the MS4 General Permit. In addition, politically, it will be very challenging if not impossible to locally require private properties to retrofit their site without some redevelopment that triggers local oversight without a new regulatory framework from EPA.

Changes Needed

To further implement the PCP on private property, the Town would need to undertake changes to local code. Some changes to consider include:

1. Potentially reducing the threshold by which a project would be reviewed through local code. Reducing this threshold would require a broader range of smaller-scale projects to comply with phosphorus reduction requirements.
2. Changes to roadway width, parking, and other requirements in zoning that result in creation of impervious cover. This will be evaluated by the end of permit year 4 as part of complying with Minimum Control Measure 5: Post-Construction Stormwater Management.

Permit Year 5

(July 1, 2022 – June 30, 2023)

Year 5 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2022-June 30, 2023

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form. Also ensure any websites included on this form are to publicly accessible sites

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2022 and June 30, 2023 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization: Town of Bellingham

EPA NPDES Permit Number: MAR041091

Primary MS4 Program Manager Contact Information

Name: David Ahnert Title: GIS Coordinator, MS4 Compliance Manager

Street Address Line 1: 26 Blackstone Street

Street Address Line 2:

City: Bellingham State: MA Zip Code: 02019

Email: Dahnert@bellinghamma.org Phone Number: (508) 966-5816

Stormwater Management Program (SWMP) Information

SWMP Location (publicly available web address): https://www.bellinghamma.org/stormwater

Date SWMP was Last Updated: October 2022

If the SWMP is not available on the web please provide the physical address:

The October 2022 version of the SWMP and IDDE Plan is available at the DPW at 26 Blackstone Street. After the Annual Report is submitted, an updated SWMP with Year 5 records including this report will be published to the stormwater website (replacing the 2020 version).

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☐ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☒ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. ***By checking each box you are certifying that you have completed that permit requirement fully.*** *If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Annual Requirements

☒ Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements

☒ Kept records relating to the permit available for 5 years and made available to the public

☒ The SSO inventory has been updated, including the status of mitigation and corrective measures implemented

- ○ This is not applicable because we do not have sanitary sewer
- ○ This is not applicable because we did not find any new SSOs
- ◉ The updated SSO inventory is attached to the email submission
- ○ The updated SSO inventory can be found at the following publicly available website:

☒ Updated system map due in year 2 as necessary

☒ Provided training to employees involved in IDDE program within the reporting period

☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters

☒ All curbed roadways were swept at least once within the reporting period

☒ Enclosed all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt

☒ Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities

- ☒ Updated inventory of all permittee owned facilities as necessary
- ☒ O&M programs for all permittee owned facilities have been completed and updated as necessary
- ☒ Implemented all maintenance procedures for permittee owned facilities in accordance with O&M programs
- ☒ Implemented program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- ☐ Inspected all permittee owned treatment structures (excluding catch basins)

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Similar to previous permit years, the Town's "Good Housekeeping and Pollution Prevention Program for Municipal Operations and Maintenance" includes maintenance procedures for Town facilities and MS4 infrastructure, which are implemented to the maximum extent practicable. The Town's inventory of facilities is updated continuously, however, in Permit Year 6 the Town will incorporate all changes to date in the O&M Plan.

The Town continues to inspect and mow municipal stormwater basins as necessary. In-line proprietary BMPs are also routinely inspected. Integration into the Town's GIS database with mobile data collection forms is still in development.

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

- ☒ Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- ☒ Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- ☒ Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria
    - ☐ This is not applicable because there are no septic systems present

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Charles River Watershed Phosphorus TMDL

- ☐ Completed the written Phase 1 Phosphorus Control Plan (PCP), including: *(select the items in the Phase 1 PCP that have been completed)*

☐ Planned nonstructural controls
☐ Planned structural controls
☐ O&M program for structural controls
☐ Implementation schedule
☐ Cost of implementation

The Phase 1 PCP: (*select one of the following options)*

○ is attached to the email submission
◉ can be found at the following publicly available website:

Below, calculate your current phosphorus export rate by first filling out the individual phosphorus loading components (labeled [A], [B], [C], and [D]) and then computing your current phosphorus export rate using the equation provided.

Baseline phosphorus export reduction required from PCP Area, as identified in Appendix F **(lbs/year) [A]**: 1,766

☒ Documented the nonstructural control measures implemented during **this reporting period** and their phosphorus reduction

total phosphorus reduction from all nonstructural controls this reporting period **(lbs/year) [B]**: 9.5

○ No nonstructural control measures were implemented
◉ The above referenced nonstructural control measures information is attached to the email submission
○ The above referenced nonstructural control measures information can be found at the following publicly available website:

☐ Documented the structural control measures implemented during **this reporting period and all previous years**, including location, phosphorus reduction in mass/year, and date of last completed maintenance and inspection for each control

total phosphorus reduction from all structural controls installed this reporting period and all previous years **(lbs/year) [C]**: 0

◉ No structural control measures were implemented
○ The structural control measures information is attached to the email submission
○ The structural control measures information can be found at the following publicly available website:

Phosphorus load increase due to development incurred since 2005 in **lbs/year [D]**: -299

Current phosphorus export rate from the PCP Area in **lbs/year [=A-(B+C)+D** from above**]**: 1,458

☐ I certify under penalty of law that all source control and treatment Best Management Practices being claimed for phosphorus reduction credit have been inspected, maintained and repaired in accordance with manufacturer or design specification. I certify that, to the best of my knowledge, all Best Management Practices being claimed for a phosphorus reduction credit are performing as originally designed.

☐ All municipally owned and maintained turf grass areas are being managed in accordance with Massachusetts Regulation 331 CMR 31 pertaining to proper use of fertilizers on turf grasses

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The Town contracts turf grass management. Per the vendor, NaturaLawn of America any fertilizing of grass areas is being done by using organic fertilizers. The Town will work with this vendor to certify that turf grass areas are being managed in accordance with Massachusetts Regulation 331 CMR 31 in Permit Year 6.

In 2022, CRWA was awarded a FY23 MS4 Municipal Assistance Grant Program that allowed experts from the University of Vermont Spatial Analysis lab to create updated, high-resolution maps of land use and impervious surfaces across the watershed. This data was distributed to Charles River on communities on June 29, 2023, which made it impossible to complete with Phase 1 PCP by June 30th and challenging to complete by September 28th. This land use data was used to estimate Bellingham's current phosphorus loading. The CRWA impervious area delineation, upon visual investigation, under-counted Bellingham's impervious area. The Town then incorporated impervious area data/imagery from NearMap (March 2023). The calculations provided here are preliminary. The PCP has been drafted, however there is still work to be done to finalize this plan. The draft includes these calculations, legal analysis, funding source assessment, operation & maintenance certification recommendations, and retrofit discussion. For the Annual Report, we have included a 2018 estimate for sweeping credits; this will be reviewed with the latest land use and impervious area. A complete Phase 1 PCP will be sent to EPA by the end of October and posted for public comment.

NON-TRADITIONAL AND TRANSPORTATION MS4s ONLY- *municipalities please skip this section:*

Describe the planned phosphorus reduction activities on site and coordination progress with the applicable municipality:

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

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- (●) Yes
- ( ) No

If yes, describe below, including any relevant impairments or TMDLs:

Bellingham's NOI listed water quality impairments and TMDLs for the Town's receiving waters based on the 2014 303(d) List. In Permit Year 2, the Town evaluated changes to the impairments and/or receiving waters based on the final 2016 303(d) List and the analysis was submitted with the Town's Permit Year 2 Annual Report and is available in the Town's SWMP. In Permit Year 4, the Town evaluated any changes to the impairments and/or receiving waters based on the final 2018/2020 303(d) List and the analysis was submitted with the Town's Permit Year 4 Annual Report.

In Permit Year 5, the Town evaluated any changes to the impairments and/or receiving waters based on the final 2022 303(d) List and the analysis is included as an attachment with this report. There were no changes to Bellingham's impairments as a result of the 2022 list.

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed **during this reporting period**: 6

*Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.*

BMP:Education and Outreach to Residents - Town Website

Message Description and Distribution Method:

Educational materials remain on the Town's DPW webpage on stormwater pollution prevention for households identifying car oils, household pesticide and fertilizer applications, pet waste, yard clippings, and litter as contamination sources. This also included links to educational coloring books, games, and activities for kids. Materials on the webpage included:
-"When it Rains, it Drains"
-"Soak up the Rain"
-"How Water Works"
-"Liquid Assets" (video link)
https://www.bellinghamma.org/department-public-works/pages/stormwater-information-updated

Additionally, the Town's Board of Health webpage includes an informational graphic "Be Septic Smart!" illustrating septic system best practices and proper maintenance.

Targeted Audience: Residents

Responsible Department/Parties: DPW

Measurable Goal(s):

This messaging is available to all visitors of the Town's DPW Stormwater Information and Board of Health webpages.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Educational and Outreach to Residents - Pet Waste

Message Description and Distribution Method:

A postcard entitled "Please Scoop the Poop" is available at the Town Clerk's office where residents apply for a

dog license. This messaging explains the impacts of pet waste on waterways and describes the actions that should be taken to mitigate the impact.

Targeted Audience: Residents

Responsible Department/Parties: Planning/zoning Department

Measurable Goal(s):

The postcards are available to all Town Clerk visitors.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Educational and Outreach to Residents - Pet Waste

Message Description and Distribution Method:

The DPW website provides "Doggie Tips" about the harms of pet waste and encourages scooping the poop. The Town's DPW Facebook page posted an infographic advising residents on proper disposal methods of pet waste.

Targeted Audience: Residents

Responsible Department/Parties: DPW

Measurable Goal(s):

This message is available to all visitors of the Town's DPW webpage. The Facebook post received 2 likes (July 2022).

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Education and Outreach to All Audiences - Stormwater Utility

Message Description and Distribution Method:

Like previous permit years, the Town's stormwater utility fee schedule and regulations are posted on the Town's website, as well as an FAQ page: https://www.bellinghamma.org/

sites/g/files/vyhlif2796/f/uploads/stormwater_utility_handout_final.pdf

Targeted Audience: All Audiences

Responsible Department/Parties: DPW

Measurable Goal(s):

These documents are available to all visitors of the Town's webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Education and Outreach to Multiple Audiences - Town Website

Message Description and Distribution Method:

Educational material on stormwater pollution prevention for industrial sites including anti-icing best management practices, pollution prevention for businesses, stormwater pollution prevention for developers, general construction and site supervision stormwater tips from MassDCR, and stormwater pollution prevention for small residential construction sites remains displayed on the Town's website: https://www.bellinghamma.org/planning-board/pages/stormwater-management-best-practices

Targeted Audience: Industrial Facilities, Businesses, Commercial Facilities, Developers

Responsible Department/Parties: Planning Board

Measurable Goal(s):

This messaging was available to all visitors of the Town's Planning Board Stormwater Best Management Practices webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP:Public Education and Outreach: Leaf Litter and Yard Waste

Message Description and Distribution Method:

The Town's DPW Facebook page posted 3 infographics relaying important information to the public regarding

leaf litter and yard waste. One of the posts included information about the Yard Waste Pickup schedule, while the others advised residents on how to properly dispose of yard waste and leaf litter.

Targeted Audience: Residents

Responsible Department/Parties: DPW

Measurable Goal(s):

In total, the three posts received 8 likes and 3 shares.

Message Date(s): October 21, 2022 (2 posts)
October 31, 2022

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period**:

The Stormwater Management Plan (SWMP) remains publicly available on the Town's stormwater website for ongoing public review and feedback.

Was this opportunity different than what was proposed in your NOI? Yes ○ No ◉

Describe any other public involvement or participation opportunities conducted **during this reporting period**:

The Town hosted a Household Hazardous Waste Day on July 23, 2022 from 9:00am to 1:00pm at Bellingham Middle School. The Town also has an agreement with Norfolk Recycling/Transfer Station on Wednesdays. This information is on the Board of Health Website: https://www.bellinghamma.org/board-health/pages/hazardous-waste-news

The Town Recycling Center remains available to residents Saturday and Sunday from 8am-2pm beginning in April for summer hours and on Saturdays from 8:00am to 2:00pm beginning in December for winter hours. The recycling center accepts metals, yard waste, oil based and latex paints, household appliances, mercury containing items, and more.

There were over 60 volunteers for Bellingham's annual Earth Day cleanup which was held on April 15th, 2023. In all, both individual and group volunteers collected 150-175 trash bags and 18-24 tires which equated to roughly 20 tons of trash total. Local business sponsors/donors provided donuts and pizzas following the event. DPW, Senior Center, and Bellingham Police also participated in the event.

The rain barrel program was restarted and had decent participation. Barrels were distributed to 57 residents. The first 100 participants get a discount. The discount was funded is the DPW Stormwater Enterprise to help offset costs to residents. The Town's DPW Facebook page posted a flyer in April 2023 providing residents with information regarding Bellingham's 2023 Rain Barrel Program. The post explains the benefits of rain barrels for both the owner and the Town's stormwater system. Information regarding how to purchase a rain barrel is also included.

The Town hosted a Christmas Tree Pickup event on Saturday, January 14, 2023. Residents also had the option to bring their trees to the Town Recycle Center during winter hours of Saturdays from 8:00am to 2:00pm.

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

☐ This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period**.*

Number of SSOs identified: 1

Number of SSOs removed: 1

MS4 System Mapping

Optional: Provide additional status information regarding your map:

Building upon efforts from previous year, the Town continues to refine the MS4 GIS mapping as the IDDE program is implemented.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses. Please also include the updated inventory and ranking of outfalls/interconnections based on monitoring results.

◉ No outfalls were inspected

○ The above referenced outfall screening data is attached to the email submission

○ The above referenced outfall screening data can be found at the following publicly available website:

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

Number of outfalls screened: 0

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

Percent of outfalls screened: 82

Optional: Provide additional information regarding your outfall/interconnection screening:

Of the remaining 45 outfalls that could not be located during previous permit years, 21 outfalls were able to be located by DPW staff in Permit Year 5. 24 mapped outfalls remain to be field located. The Town will continue to attempt to locate and screen these remaining outfalls in Permit Year 6.

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- (●) No catchment investigations were conducted
- ( ) The catchment investigation data is attached to the email submission
- ( ) The catchment investigation data can be found at the following publicly available website:

*Below, report on the number of catchment investigations completed **during this reporting period**.*

Number of catchment investigations completed this reporting period: 0

*Below, report on the percent of catchments investigated **to date.***

Percent of total catchments investigated: 0

Optional: Provide any additional information for clarity regarding the catchment investigations below:

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- (●) No illicit discharges were found
- ( ) The illicit discharge removal report is attached to the email submission
- ( ) The illicit discharge removal report can be found at the following publicly available website:

*Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed **during this reporting period.***

Number of illicit discharges identified: 0

Number of illicit discharges removed: 0

Estimated volume of sewage removed: 0 gallons/day

Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed ***since the effective date of the permit (July 1, 2018)****.*

Total number of illicit discharges identified: 0

Total number of illicit discharges removed: 0

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

Employee Training

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

An MS4 program employee training was conducted for 9 town parks staff on June 28, 2023 that served as a refresher course IDDE and good housekeeping.

The DPW GIS Coordinator MS4 Compliance Manager attended the Annual EPA MS4 Reporting Year 5 Template workshop and MS4 compliance training through American Stormwater Institute. This staff also stayed abreast of BMPs, news and technology related to MS4.

MCM4: Construction Site Stormwater Runoff Control

Below, report on the construction site plan reviews, inspections, and enforcement actions completed ***during this reporting period****.*

Number of site plan reviews completed: 9

Number of inspections completed: 18

Number of enforcement actions taken: 0

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

The following nine projects are listed on the Planning Board website were under review and/or approved during Permit Year 5: Prospect Hill Estates, 353 Maple Street, 306 Maple St, 0 Maple Street, Snett Trail Estates (0080-0009-0001), 455 Hartford Ave, WS Development (behind Home Depot), North St & Blackstone St, Maple Street Solar. https://www.bellinghamma.org/planning-board

Each project was inspected twice during this permit year. The GIS Coordinator is developing an inspection form to better track construction period inspections.

For each site plan applicant, a Stormwater 101 handout is given. Each applicant is required to provide a SWPPP, an Erosion Control Plan, and a post construction management plan.

Similar to previous permit years, there were no formal enforcement actions, which are only needed if corrective action are not completed as requested.

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Date update was completed (due in year 3): November 10, 2016

Website of ordinance or regulatory mechanism: https://www.bellinghamma.org/sites/g/files/vyhlif2796/f/uploads/procedural_rules_for_the_planning_board_0.pdf

As-built Drawings

*Below, report on the number of as-built drawings received **during this reporting period**.*

Number of as-built drawings received: 1

Optional: Enter any additional information relevant to the submission of as-built drawings:

The Town has been able to require and enforce stormwater management standards through Article IX of the Town of Bellingham Zoning Bylaws Section 240-54 and in Section 7 of the Planning Board Procedural Rules. The Town planned to revise and clarify updated standards in the Planning Board Procedural Rules since the MA Stormwater Handbook has not yet been updated to meet EPA's standards. During Permit Year 5 a meeting was held with Town staff and hired consultant to discuss the drafted language. Due to staff turnover (DPW Director, Planner, and Conservation Agent), the regulations update was not finalized in Permit Year 5. The Town plans to update the regulations in Permit Year 6 along with relevant recommendations of the local code assessment.

Street Design and Parking Lots Report

Below, describe any changes made or planned to be made to local regulations and guidelines based on the report completed in Year 4:

N/A - proposed recommendations are not due until future permit years

Local Code Assessment was completed in Permit Year 5.

Green Infrastructure Report

Below, describe progress towards making green infrastructure practices allowable based on the report completed in Year 4:

N/A - proposed recommendations are not due until future permit years

Local Code Assessment was completed in Permit Year 5.

The town plans to continue instituting green infrastructure practices in our regulations. These are also reviewed when looking at applicants site plans.

Retrofit Properties Inventory

Below, list remaining permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas (must maintain a minimum of 5 sites in inventory until less than 5 sites remain):

1. 26 Pearl Street
2. 292 Hartford Avenue
3. Depot St - Parcel 0033-0002-0000
4. Depot St across from 215 St - Parcel 0038-0023 (part), soon to be town-owned
5. 10 Mechanic St - road entrance to Town Hall for the Red Mill project on Mill St.

Prioritization of these sites is subject to change based on available funding and further feasibility assessment, design, and permitting of projects. The Town has a short-list of alternative sites if one of these 5 sites is less desirable.

Below, list all properties that have been modified or retrofitted with BMPs to mitigate impervious area that were inventoried as part of 2.3.6.d of the permit. Non-MS4 owned properties that have been modified or retrofitted with BMPs to mitigate impervious area may also be listed, but must be indicated as non-MS4.

South Main Street Roadway Improvement Project is underway and includes a large bioretention basin near the intersection of South Main Street and Blackstone Street.

MCM6: Good Housekeeping

Catch Basin Cleaning

Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins ***during this reporting period****.*

Number of catch basins inspected: 2,250

Number of catch basins cleaned: 2,250

Total volume or mass of material removed from all catch basins: 594 cubic yards

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

Total number of catch basins: 3,040

If applicable:

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

These totals may include catch basins outside of the urbanized area.

Street Sweeping

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

- (●) Number of miles cleaned: 474
- ( ) Volume of material removed: [Select Units]
- ( ) Weight of material removed: [Select Units]

Stormwater Pollution Prevention Plan (SWPPP)

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

Number of site inspections completed: 8

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

DPW Inspections - In all four quarterly inspections, high grass in the grass channel and sediment build up in the swale, retention pond, and sediment forebay are noted. It is recommended that the grass is mowed and a barrier be build to stop silt from escaping the stockpile.

RCC Inspections - No corrective actions were noted for quarter 1. In Quarter 2 it was noted that roadway should graded and debris should be moved from the stockpile area. These issues were resolved by Quarter 3 and Quarter 4.

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- (●) Not applicable
- ( ) The results from additional reports or studies are attached to the email submission

○ The results from additional reports or studies can be found at the following publicly available website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Additional Information

Optional: Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above. If any of the above year 5 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

All streets are swept twice per year with a mechanical sweeper approximately April-June and September - December. The total miles swept are in total miles that the sweeper drove (approximately lane miles). There are approximately 101 road miles in Bellingham.

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 6 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected

- Sweep all curbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary
- Review O&M programs for all permittee owned facilities; update if necessary
- Implement all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implement program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Enclose all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- Review as-built drawings for new and redevelopment to ensure compliance with post construction bylaws, regulations, or regulatory mechanism consistent with permit requirements
- Inspect all permittee owned treatment structures (excluding catch basins)
- Identify additional permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious areas so that the permittee maintains a minimum of 5 sites in their inventory, until such a time when the permittee has less than 5 sites remaining

Provide any additional details on activities planned for permit year 6 below:

The Town acknowledges the General Permit Year 6 requirements and will complete as many activities as possible based on funding and staff availability.

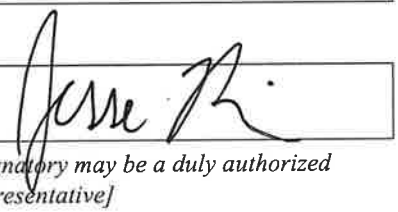
Part V: Certification of Small MS4 Annual Report 2023

40 CFR 144.32(d) Certification

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

Name: Jesse M. Reidle

Title: DPW Director

Signature: 

Date: 9/27/23

[Signatory may be a duly authorized representative]

Summary of Bellingham's TMDLs and Impaired Waters [1, 2]

Receiving Waterbody	2018/2020 Category	2018/2020 Water Quality Impairments	2022 Category	2022 Water Quality Impairments	Applicable General Permit Section	Changes to Permit Requirements
Arnolds Brook (MA51-32)	5	E. Coli	5	E. Coli	Appendix H, Section III - Pathogens	None
Beaver Brook (MA72-12)	5	E. Coli	5	E. Coli	Appendix H, Section III - Pathogens Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL	None
Peters River (MA51-18)	5	E. Coli Temperature	5	E. Coli Temperature	Appendix H, Section III - Pathogens	None
Beaver Pond (MA72004)	4a	Mercury in Fish Tissue (TMDL 33880)	4a	Mercury in Fish Tissue (TMDL 33880)	Appendix F, Section C - Mercury TMDL Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL	No requirements related to this Mercury TMDL are imposed on MS4 discharges under this part. If the permittee becomes aware, or EPA or MassDEP determines, that an MS4 discharge is causing or contributing to such impairment to an extent that cannot be explained by atmospheric decomposition (e.g. chemical spill, acid landfill leachate or other sources), the permittee shall comply with the requirements of 2.1.1d and 2.3.4 of the permit.
Charles River (MA72-04)	5	Flow Regime Modification Ambient Bioassays - Chronic Aquatic Toxicity Chlordane in Fish Tissue DDT in Fish Tissue E. Coli Fish Bioassessments Mercury in Fish Tissue Nutrient/Eutrophication Biological Indicators Phosphorus, Total Temperature	5	Flow Regime Modification* Ambient Bioassays - Chronic Aquatic Toxicity Chlordane in Fish Tissue DDT in Fish Tissue E. Coli (TMDL 32366) Fish Bioassessments Mercury in Fish Tissue Nutrient/Eutrophication Biological Indicators Total Phosphorus (TMDL 40317) Temperature	Appendix F, Section A.III - Bacteria and Pathogen TMDL Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL	None
Charles River[3] (MA72-03)	5	Algae DDT in Fish Tissue Dissolved Oxygen Supersaturation E.Coli Organic Enrichment (Sewage) Biological Indicators Phosphorus, Total	5	Algae (TMDL 40317) DDT in Fish Tissue Dissolved Oxygen Supersaturation (TMDL 40317) E. Coli (TMDL 32365) Organic Enrichment (Sewage) Biological Indicators (TMDL 40317) Total Phosphorus (TMDL 40317)	Appendix F, Section A.III - Bacteria and Pathogen TMDL Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL	None
Jenks Reservoir (MA51075)	4c	Non-Native Aquatic Plants	4c	Non-Native Aquatic Plants*		None
Mine Brook[3] (MA72-14)	5	Habitat Assessment E.Coli Temperature	5	Habitat Assessment* E. Coli Temperature	Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL	Requirements of Appendix H, Section III - Pathogens are not applicable because there ar
Hopping Brook (MA72-35)	5	E.Coli	5	E. Coli	Appendix H, Section III - Pathogens Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL	None
Silver Lake (MA51150)	4c	Non-Native Aquatic Plants	4c	Non-Native Aquatic Plants		None
Lake Hiawatha (MA51062)	3		3			None
TMDL for Pathogens within the Charles River Watershed	Appendix F, Section A.III - Bacteria and Pathogen TMDL					None
Final TMDL for Nutrients in the Lower Charles River Basin	Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL					None
TMDL for Nutrients in the Upper/Middle Charles River	Appendix F, Section A.I - Charles River Watershed Phosphorus TMDL					None

[1] The Charles River Phosphorus TMDL applies to stormwater discharged either directly or indirectly via tributaries into the Charles River. Waters triburary to the Charles River with a direct surface water connection are noted in orange text; the TMDL applies to other tributaries not currently on the Massachusetts Integrated List of Waters.

[2] Note that some impairments have been renamed between 2014 and 2016 Integrated List of Waters: Other Flow Regime Alterations -> Flow Regime Modifications; Chlordane -> Chlordane in Fish Tissue; DDT -> DDT in Fish Tissue; Fishes Bioassessments -> Fish Bioassessments; Habitat Assessment (Streams) -> Habitat Assessment; Water Temperature -> Temperature

[3] Waterbody does not receive direct discharge from the MS4. MS4 discharges to a tributary/wetland of the waterbody. Included for reference only.

* TMDL not required (non-pollutant)

Tighe&Bond
Engineers | Environmental Specialists

11-0852-035
September 17, 2018

Donald DiMartino, DPW Director
Department of Public Works
26 Blackstone Street
Bellingham, MA 02019-1602

Re: **Street Sweeping as Method of Phosphorus Load Reduction for the Town of Bellingham**

Dear Mr. DiMartino:

Based on our recent discussions about Bellingham's municipal stormwater program, Tighe & Bond understands that the Town would like to consider the development of an in-house street sweeping program as a means of reducing the Town's phosphorus loadings to the Charles River watershed to address requirements of the Environmental Protection Agency's (EPA's) Small Municipal Separate Storm Sewer System (MS4) General Permit.

Based on information you provided, the in-house program would consist of two sweepers and a dump truck and the Town would sweep all streets once a month during the "non-freezing" season.

As requested, Tighe & Bond has prepared this letter to provide the Town of Bellingham with a brief interpretation of the MS4 street sweeping "credits", interpretation of what "continuous" sweeping means, the reduction associated with the different methods of street sweeping (e.g., broom or vacuum) and the frequency of sweeping, and input on cost-effectiveness in meeting Bellingham's phosphorus reduction goal specified by EPA.

Background

As you are aware, the Environmental Protection Agency's (EPA's) new Small MS4 General Permit effective July 1, 2018, requires Bellingham to reduce phosphorus loadings to the Charles River and its tributaries by developing and implementing a Phosphorus Control Plan (PCP) that considers structural and non-structural practices to reduce the discharge of phosphorus in stormwater. EPA expects an iterative planning and implementation process, with interim phosphorus reduction milestones and a fully implemented PCP within 20 years of the permit effective date.

In our June 30, 2018 letter, Tighe & Bond recommended that the Town of Bellingham undertake the PCP within the Urbanized (MS4 Regulated) Area only. This translates to a phosphorus load reduction of 161 lbs/year (25% of target) and 642 lbs/year (100% of target) by the end of Permit Years 10 and 20, respectively. If Bellingham decides to undertake the PCP in the entire watershed, the Town would be required to achieve a load reduction of 183 lbs/year and 730 lbs/year by the end of Permit Years 10 and 20, respectively.

Potential Street Sweeping "Credits"

An Enhanced Street Sweeping Program is one of the non-structural controls to reduce phosphorus allowed by EPA's 2016 Small MS4 General Permit. Attachment 2 to Appendix F of the permit presents the methodology to calculate the phosphorus load reduction "credit" from sweeping.

The potential phosphorus load reduction provided by street sweeping varies based on the type of sweeping and the frequency of sweeping.

The following equation is provided by EPA to calculate the phosphorus reduction credit from the implementation of an enhanced sweeping program:

> *Credit (lb/year) = Impervious Area Swept (acres) x Phosphorus Load Export Rate for impervious cover and specified land use (lb/acre/year) x Phosphorus Reduction Load for sweeping (Table 1 below) x Annual Frequency (AF) of Sweeping*

The Phosphorus Load Export Rate for impervious cover within each specified land use is provided by EPA in Attachment 2 to Appendix F of the permit. For example, a load of 1.78 lbs/acre/year of phosphorus is expected to be contributed to the watershed from impervious cover on commercial and industrial land uses and a load of 1.96 lbs/acre/year of phosphorus is expected to be contributed to the watershed from impervious cover on medium density residential land uses.

Table 1 shows the Phosphorus Reduction Factors provided by EPA to calculate the reduction in phosphorus loads for varying frequencies of street cleaning and equipment. Generally speaking, more expensive and efficient equipment and more frequency sweeping offer greater load reductions.

Table 1:
MS4 Phosphorus Reduction Credits for Sweeping based on Frequency and Type of Sweeping

Frequency[1]	Sweeper Technology	$PRF_{sweeping}$
2/year (spring and fall)[2]	Mechanical Broom	0.01
2/year (spring and fall)[2]	Vacuum Assisted	0.02
2/year (spring and fall)[2]	High-Efficiency Regenerative Air-Vacuum	0.02
Monthly	Mechanical Broom	0.03
Monthly	Vacuum Assisted	0.04
Monthly	High Efficiency Regenerative Air-Vacuum	0.08
Weekly	Mechanical Broom	0.05
Weekly	Vacuum Assisted	0.08
Weekly	High Efficiency Regenerative Air-Vacuum	0.10

Notes:

1. For full credit for monthly and weekly frequency, sweeping must be conducted year-round. Otherwise, the credit should be adjusted proportionally based on the duration of the sweeping season (using AF factor). For example, if sweeping does not occur in Dec/Jan/Feb, the frequency would be 9 mo./12 mo. = 0.75.
2. To earn credit for semi-annual sweeping the sweeping must occur in the spring following snow-melt and road sand applications to impervious surfaces and in the fall after leaf-fall and prior to the onset to the snow season.

Continuous Sweeping

EPA does not provide specific credits for "continuous sweeping." EPA's credit system assumes communities will be implementing some form of an ongoing sweeping program such that each curb of each roadway is swept at a specified frequency. However, Bellingham could undertake a continuous sweeping program, which we would consider to mean sweeping is completed almost daily somewhere in town (with some breaks for holidays, staff time off, etc.), and

could track the frequency of actual sweeping for each roadway and complete the necessary calculations based on actual sweeping completed (i.e., some roadways may be swept weekly, some monthly, and some only twice per year depending on the sweeping route).

Potential Phosphorus Load Reduction Provided by Street Sweeping "Credits"

As part of evaluating the PCP under our previous scope of work, Tighe & Bond utilized EPA's methodology to estimate potential phosphorus load reductions that Bellingham could achieve under various street sweeping scenarios as shown in Table 2. Note that these calculations utilized available GIS mapping to determine loading based on land use and impervious area swept. We used GIS to measure approximately 65 miles of sweepable roadway (does not include state highway) and municipal parking lot areas. In addition, these calculations reflect sweeping within the entire Charles River Watershed as in practicality, sweeping would not likely be limited to the Urbanized Area only.

The values presented in Table 2 need to be refined based on the decision to only utilize the Urbanized Area for the PCP and based on actual roadways planned to be swept and the frequency for each roadway (e.g., main roads may be more frequent) and actual area of municipal parking lots swept. However, the values in Table 2 provide sufficient understanding of the approximate credit achieved under various scenarios compared to Bellingham's total load reduction required. The "credit" for each frequency and type of sweeping would be similar for counting sweeping only within the Urbanized Area.

Results for monthly and weekly sweeping are shown for an annual frequency of twelve months per year and for a frequency of nine months per year (e.g., assuming sweeping in all non-freezing months), as Bellingham staff indicated that would be a feasible schedule.

It should be noted that the MS4 General Permit requires Bellingham to sweep a minimum of twice a year within the Charles River watershed.

TABLE 2

Potential Annual Phosphorus Removal by Sweeping Type and Frequency

Frequency and Type of Sweeping	PRF	Assuming 12 mo/year Sweeping			Assuming 9 mo/year Sweeping		
		Approximate lbs of P Removed Annually	% of total 183 lbs/year Reduction required for Years 1-10	% of total 730 lbs/year Reduction required for Years 10-20	Approximate lbs of P Removed Annually	% of total 183 lbs/year Reduction required for Years 1-10	% of total 730 lbs/year Reduction required for Years 10-20
2/year Mechanical Broom	0.01	9.5	5%	1%	--	--	--
2/year Vacuum Assisted	0.02	19.1	10%	3%	--	--	--
2/year High Efficiency Regenerative Air Vacuum	0.02	19.1	10%	3%	--	--	--
Monthly Mechanical Broom	0.03	28.6	16%	4%	21.4	12%	3%
Monthly Vacuum Assisted	0.04	38.1	21%	5%	28.6	16%	4%
Monthly High Efficiency Regenerative Air-Vacuum	0.08	76.2	42%	10%	57.2	31%	8%
Weekly Mechanical Broom	0.05	47.6	26%	7%	35.7	20%	5%
Weekly Vacuum Assisted	0.08	76.2	42%	10%	57.2	31%	8%
Weekly High Efficiency Regenerative Air Vacuum	0.1	95.3	52%	13%	71.5	39%	10%

Comments on Cost-effectiveness in Meeting Bellingham's Phosphorus Reduction Goal

In making a decision about the overall cost-effectiveness of street sweeping in achieving Bellingham's phosphorus reduction goals, the Town should develop a long-term performance and life-cycle cost comparison of EPA's allowable BMPs. For sweeping, the following factors should be considered:

- Capital and Operational Costs: We understand that Bellingham currently hires a contractor to complete sweeping and therefore completing sweeping in-house requires a capital investment in equipment and dedicating Town staff to sweeping. In addition, owning equipment requires operation and maintenance costs for vehicle upkeep. Town staff need to consider the annual cost of owning the equipment for and operating a street sweeping program, including staff salaries and overhead, ongoing maintenance and repair of vehicles, and replacement parts for the vehicles. Our understanding is that capital and operational costs for vacuum sweepers are significantly greater than for mechanical broom sweepers. Town staff should also factor in increased disposal costs for sweeping material collected.

- Sweeping speed and schedule: The optimum average forward sweeping speed is approximately 5 miles per hour. This is good balance for the tradeoff between pickup performance effectiveness and the need to sweep a reasonable length of streets in a given day. There will be a range of approximately 3 to 7 miles per hour while sweeping that will occur daily. Assuming 5 miles per hour, sweeping both curbs of 65 miles of roadway in the Charles River watershed alone will take 26 hours, so approximately five to seven work days would be required to sweep roadways as well as municipal parking lots. This does not consider sweeping in the southern half of Bellingham outside of the Charles River watershed. It also does not consider time for disposal of material (either via trips back to the DPW yard to via dump truck), down-time, obstacles, traffic, or other factors. The standard hopper of a typical sweeper such as an Elgin Pelican, is about 3.5 cubic yards. Rate of sweeping uptake will impact the frequency the sweeper needs to be emptied per lane mile.

- Percent of total load reduction and cost per pound removed annually: Considering a practical scenario, assuming Bellingham can sweep each curb on every street and all town parking lots a minimum of monthly for approximately 9 months per year using a mechanical broom sweeper, the Town would remove up to 21 lbs of phosphorus annually, which is just under 3% of the total long-term load required to be removed. Town staff should develop an annual cost per pound of phosphorus removed for each sweeping type and frequency the Town may potentially undertake.

- Comparison to structural BMP costs: As described in our June 30, 2018 letter, actual costs for structural BMPs will vary depending on type of BMP, land ownership, material and labor costs at the time of construction, and therefore Bellingham can expect to spend somewhere between the costs extrapolated by the 2011 Subwatershed Study ($7.5 Million) and the 2011 Funding Feasibility study ($29.7 Million). Structural BMPs will cost between approximately $11,500 per lb/year and $38,000 per lb/year of phosphorus load reduced ($2018). After a cost per pound is developed, Town staff should compare sweeping costs to structural BMP costs.

In comparison to structural BMPs, conventional wisdom and recent studies say sweeping is a cost-effective method of phosphorus removal that should be implemented as part of Bellingham's Phosphorus Control Plan. However, a more thorough cost analysis should be completed by Town staff to confirm this assumption.

Please feel free to contact Jennie at 781-708-9826 or JSMoonan@tighebond.com or Emily at 508-471-9606 or EJScerbo@tighebond.com should you have any questions or comments.

Very truly yours,

TIGHE & BOND, INC.

Jennie Moonan, P.E.
Project Manager

Emily J. Scerbo, P.E.
Senior Stormwater Technical Specialist

Permit Year 6

(July 1, 2023 – June 30, 2024)

Year 6 Annual Report
Massachusetts Small MS4 General Permit
Reporting Period: July 1, 2023-June 30, 2024

Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form. Also ensure any websites included on this form are to publicly accessible sites

Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2023 and June 30, 2024 unless otherwise requested.

Part I: Contact Information

Name of Municipality or Organization: Town of Bellingham

EPA NPDES Permit Number: MAR041091

Primary MS4 Program Manager Contact Information

Name: David R. Ahnert Title: GIS Coordinator, MS4 Compliance Manager

Street Address Line 1: 26 Blackstone Street

Street Address Line 2:

City: Belllingham State: MA Zip Code: 02019

Email: DAhnert@bellinghamma.org Phone Number: (508) 966-5816

Stormwater Management Program (SWMP) Information

SWMP Location (publicly available web address): https://www.bellinghamma.org/201/Stormwater

Date SWMP was Last Updated: February 2024

If the SWMP is not available on the web please provide the physical address:

Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state

Impairment(s)

☒ Bacteria/Pathogens ☐ Chloride ☐ Nitrogen ☐ Phosphorus
☐ Solids/ Oil/ Grease (Hydrocarbons)/ Metals

TMDL(s)

In State: ☐ Assabet River Phosphorus ☒ Bacteria and Pathogen ☐ Cape Cod Nitrogen
☒ Charles River Watershed Phosphorus ☐ Lake and Pond Phosphorus

Out of State: ☐ Bacteria/Pathogens ☐ Metals ☐ Nitrogen ☐ Phosphorus

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. ***By checking each box you are certifying that you have completed that permit requirement fully.*** *If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

Annual Requirements

☒ Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements

☒ Kept records relating to the permit available for 5 years and made available to the public

☒ The SSO inventory has been updated, including the status of mitigation and corrective measures implemented

- ○ This is not applicable because we do not have sanitary sewer
- ○ This is not applicable because we did not find any new SSOs
- ◉ The updated SSO inventory is attached to the email submission
- ○ The updated SSO inventory can be found at the following publicly available website:

☒ Updated system map due in year 10 with information from completed catchment investigations

☒ Provided training to employees involved in IDDE program within the reporting period

☒ Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters

☒ All curbed roadways were swept at least once within the reporting period

☒ Enclosed all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt

☒ Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities

☒ Updated inventory of all permittee owned facilities as necessary

☒ O&M programs for all permittee owned facilities have been completed and updated as necessary

☒ Implemented all maintenance procedures for permittee owned facilities in accordance with O&M programs

☒ Implemented program for MS4 infrastructure maintenance to reduce the discharge of pollutants

☐ Inspected all permittee owned treatment structures (excluding catch basins)

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Similar to previous permit years, the Town's "Good Housekeeping and Pollution Prevention Program for Municipal Operations and Maintenance" includes maintenance procedures for Town facilities and MS4 infrastructure, which are implemented to the maximum extent practicable.

Although no catchment investigations were completed, the stormwater system mapping in GIS was updated during outfall investigations.

In Permit Year 6, the Town inspected 22 stormwater control measures (SCMs) of 126 mapped.

Bacteria/ Pathogens (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach**

☒ Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate

☒ Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time

☒ Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

☐ This is not applicable because there are no septic systems present

** Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Charles River Watershed Phosphorus TMDL

Below, calculate your current phosphorus export rate by first filling out the individual phosphorus loading components (labeled [A], [B], [C], and [D]) and then computing your current phosphorus export rate using the equation provided.

Baseline phosphorus export rate from PCP Area, as identified in	1,766

Appendix F **(lbs/year) [A]**:	
Total phosphorus reduction from all nonstructural controls implemented **this reporting period (lbs/year) [B]**:	27
Total phosphorus reduction from all structural controls installed this reporting period and all previous years **(lbs/year) [C]**:	0
Phosphorus load increase due to development incurred since 2005 in **lbs/year [D]**:	-299
Current phosphorus export rate from the PCP Area in **lbs/year [=A-(B+C)+D** from above**]**:	1,440

☐ I certify under penalty of law that all source control and treatment Best Management Practices being claimed for phosphorus reduction credit have been inspected, maintained and repaired in accordance with manufacturer or design specification. I certify that, to the best of my knowledge, all Best Management Practices being claimed for a phosphorus reduction credit are performing as originally designed.

☐ All municipally owned and maintained turf grass areas are being managed in accordance with Massachusetts Regulation 331 CMR 31 pertaining to proper use of fertilizers on turf grasses

☒ Implemented all nonstructural control measures **during this reporting period** and documented the measures and their phosphorus reduction. The nonstructural control measure information:

- ◉ is attached to the email submission
- ○ can be found at the following publicly available website:

Table 1-6 of the attached PCP includes the nonstructural control measure estimate.

☒ Documented the structural control measures implemented during **this reporting period and all previous years**, including location, phosphorus reduction in mass/year, and date of last completed maintenance and inspection for each control. The structural control measure information:

- ○ is not applicable; no structural control measures were implemented
- ◉ is attached to the email submission
- ○ can be found at the following publicly available website:

When O&M is formerly certified, the Town could take credit for an additional 1.4 lb/yr (see Section 1.7.1.1 of the attached PCP).

The Phase 1 PCP: (*select one of the following options. If you submitted your PCP last year and have an updated website, please include the website below)*

- ○ was submitted in the Year 5 Annual Report
- ◉ is attached to the email submission
- ○ can be found at the following publicly available website:

The appendices are available at the Engineering Department (26 Blackstone Street).

Optional: If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The Town contracts turf grass management. Per the vendor, NaturaLawn of America any fertilizing of grass

areas is being done by using organic fertilizers. The Town will work with this vendor to certify that turf grass areas are being managed in accordance with Massachusetts Regulation 331 CMR 31 in Permit Year 7.

The Phase 1 PCP was finalized in June 2024 and is attached. There are 52 constructed structural BMPs, privately and municipally owned, that were identified in Bellingham within the urbanized area of the Charles River watershed. The Town is working to formalize certification of O&M for additional phosphorus reduction in future permit years. Since the Town has already met their phosphorus reduction goals through Phase 1 of the PCP, the annual phosphorus reduction from the remaining existing structural BMPs will be calculated during Phase 2 of the PCP.

NON-TRADITIONAL AND TRANSPORTATION MS4s ONLY- *municipalities please skip this section:*

Describe the planned phosphorus reduction activities on site and coordination progress with the applicable municipality:

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

Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- (●) Yes
- ( ) No

If yes, describe below, including any relevant impairments or TMDLs:

Bellingham's NOI listed water quality impairments and TMDLs for the Town's receiving waters based on the 2014 303(d) List. In Permit Year 2, the Town evaluated changes to the impairments and/or receiving waters based on the final 2016 303(d) List and the analysis was submitted with the Town's Permit Year 2 Annual Report and is available in the Town's SWMP. In Permit Year 4, the Town evaluated any changes to the impairments and/or receiving waters based on the final 2018/2020 303(d) List and the analysis was submitted with the Town's Permit Year 4 Annual Report. In Permit Year 5, the Town evaluated any changes to the impairments and/or receiving waters based on the final 2022 303(d) List and the analysis was submitted with the Town's Permit Year 5 Annual Report. There were no changes to Bellingham's impairments as a result of the 2022 list.

During Permit Year 6, 2 outfalls were discovered during outfall investigations and 7 outfalls were removed as they were found to be other stormwater assets (i.e., BMP inlet), to not exist, or to be private or state-owned. The total number of MS4 outfalls in the Town's inventory is now 260. These modifications did not change any additional receiving waters as listed in the NOI or previous impaired waters update. The updated outfall inventory is attached.

Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

MCM1: Public Education

Number of educational messages completed **during this reporting period**: 7

*Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.*

BMP: Education and Outreach - Town Website

Message Description and Distribution Method:

The town continues to display educational materials on stormwater pollution prevention for households on vehicle maintenance (oil and soap disposal), pesticides and fertilizer use, lawn care, pet waste, and litter as contamination sources. The webpage also offers links to educational coloring books, games and activities for children. The materials available on the webpage include:
- "Liquid Assets" (Video and informational website)
- "Handling Hazardous Household Products"
- "When it Rains It Drains"
- "Think Blue Massachusetts"
- "Soak up the Rain"
- EPA Regulations
https://www.bellinghamma.org/201/Stormwater

Additionally, the Town's Board of Health webpage includes an informational graphic "Septic Smart" illustrating septic system best practices and proper maintenance.
https://www.bellinghamma.org/662/Septic-Smart

Targeted Audience: Residents

Responsible Department/Parties: DPW

Measurable Goal(s):

All visitors to the Town's DPW Stormwater Information and Board of Health webpages.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Education and Outreach to Residents - Pet Waste

Message Description and Distribution Method:

As residents apply or renew dog licenses, a post card titled "Please Scoop the Poop" is available at the Town Clerk's office. This message explains the impacts of pet waste on waterways and describes the actions that should be taken to mitigate the impact.

Targeted Audience: Residents

Responsible Department/Parties: Planning/Zoning Department

Measurable Goal(s):

Postcards are available to all Town Clerk visitors.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Education and Outreach: Leaf Litter and Yard Waste

Message Description and Distribution Method:

The Town's DPW Stormwater webpage has information available on the negative impacts of yard waste and provides helpful tips on how to mitigate that. The Town's DPW Facebook page posted the schedule for Yard Waste Pickup.

Targeted Audience: Residents

Responsible Department/Parties: DPW

Measurable Goal(s):

The post received 4 likes and 11 shares.

Message Date(s): May 3rd, 2024

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Education and Outreach to All Audiences - Stormwater Utility

Message Description and Distribution Method:

As in previous permit years, the Town's stormwater utility fee schedule and regulations are posted on the Town's website, as well as a FAQ page: https://www.bellinghamma.org/208/Stormwater-Utility-Fees-Regulations-Adju

Targeted Audience: All Audiences

Responsible Department/Parties: DPW

Measurable Goal(s):

These documents are available to all visitors of the Town's webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Education and Outreach to Residents: Pet Waste

Message Description and Distribution Method:

The Town DPW's webpage provides an additional section titled "Doggie Tips" explaining and encouraging the importance of picking up pet waste.

Targeted Audience: Residents

Responsible Department/Parties: DPW

Measurable Goal(s):

This message is available to all visitors of the Town's DPW webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Education and Outreach to Multiple Audiences - Town Website

Message Description and Distribution Method:

Educational material on stormwater pollution prevention for industrial sites is available on the Town's Planning Board webpage. Information includes anti-icing best management practices, pollution prevention for businesses, stormwater pollution prevention for developers, general construction and site supervision stormwater tips from MassDCR, and stormwater pollution prevention for small residential construction sites. https://www.bellinghamma.org/511/Stormwater-Management---Best-Practices

Targeted Audience: Industrial Facilities, Businesses, Commercial Facilities, Developers

Responsible Department/Parties: Planning/Zoning Department

Measurable Goal(s):

This message is available to all visitors of the Town's Planning Board Stormwater Best Management Practices webpage.

Message Date(s): Ongoing

Message Completed for: Appendix F Requirements ☐ Appendix H Requirements ☐

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

BMP: Bellingham Bulletin

Message Description and Distribution Method:

This Permit Year, the Town began publishing stormwater related articles in the monthly Bellingham Bulletin. The Bulletin is a monthly newsletter to residents to inform them of local events and updates. The following issues included stormwater related topics -

March 2024: The Bulletin displayed a Septic Smart Brochure from the EPA to provide septic owners how to properly take care of their septic system.

April 2024: The Bellingham Bulletin highlights key environmental initiatives, including the annual Hazardous Waste Collection Day, Earth Clean-Up day, and the Rain Barrel Program, aimed at promoting the proper disposal of hazardous waste and litter while reducing runoff.

May 2024: The Bulletin provides guidance on maintaining clean drains to protect waterways. It advises against disposing of litter, sand, leaves, pet waste, motor oil, or paint in the drains, and encourages participation in neighborhood cleanups or municipal street and catch basin cleaning efforts.

June 2024: The Bulletin includes a technique called "LID" (Low Impact Development) explaining the benefits of using a rain barrel, vegetated wetlands, permeable pavement, vegetated swale, and a sidewalk lined with permeable materials to capture and reduce runoff.

Targeted Audience: Residents

Responsible Department/Parties: DPW

Measurable Goal(s):

This message is available to all visitors of the Bellingham Bulletin webpage.
https://www.bellinghambulletin.com/

Message Date(s): Stormwater related posts monthly since March 2024

Message Completed for: Appendix F Requirements ☒ Appendix H Requirements ☒

Was this message different than what was proposed in your NOI? Yes ○ No ◉

If yes, describe why the change was made:

Add an Educational Message

MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period**:

The Stormwater Management Plan (SWMP) remains publicly available on the Town's stormwater website for ongoing public review and feedback.

Was this opportunity different than what was proposed in your NOI? Yes ○ No ◉

Describe any other public involvement or participation opportunities conducted **during this reporting period**:

Bellingham Recycling Center remains open on Saturdays and Sundays 8am to 2pm for residents starting the first week in April and open Saturdays 8am to 2pm starting the first week in December. The Recycling Center accepts hard plastics, metals, small electronics, yard waste, glass, appliances, automotive batteries, oil-based and latex paints, and lawn tractors.

The Rain Barrel Program continues to be an offer to residents in support of lowering municipal water demands, decreasing water bill and improving residential storm management. The Town's DPW also posted about the Rain Barrel on their Facebook page on April 2, 2024 advising residents they are still available.

The Town hosted a Christmas Tree Pickup event on January 13, 2024 from 8am to 2pm with the option of bringing it to the Recycling Center the following Saturday.

There were over 100 volunteers for Bellingham's annual Earth Day cleanup which was held on April 15, 2024. Both individual and group volunteers collected 200 trash bags and tires which equated to roughly 28 tons of trash total. DPW, Senior Center, and Bellingham Police also participated in the event.

The Town hosted a Household Hazardous Waste Day on July 23, 2023 from 9:00am to 1:00pm at Bellingham Middle School.

At the June 13, 2024 Public Hearing, the Town Planner gave a brief presentation related to the stormwater program and the importance of the proposed updates to the Stormwater Regulations listed in the Planning Board's Procedural Rules. This hearing was continued to June 28th for further discussion; the Regulations were adopted.

MCM3: Illicit Discharge Detection and Elimination (IDDE)

Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

☐ This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period**.*

Number of SSOs identified: 1

Number of SSOs removed: 1

MS4 System Mapping

Percent of Phase II map complete: 97

Optional: Provide additional status information regarding your map:

The Phase II mapping percentage was determined using an estimate of the completeness of the stormwater GIS based on spatial coverage in the regulated area and quantity of infrastructure within the geodatabase. To date, the Town maintains a robust stormwater database with 260 MS4 outfalls, 2,332 catch basins, 1,313 manholes, and approximately 58.9 miles of pipes mapped within the MS4. The Town plans on continuing to confirm the completeness of its Phases II mapping during the Town's catchment investigation efforts. This percentage will be continuously updated in upcoming permit years.

Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses. Please also include the updated inventory and ranking of outfalls/interconnections based on monitoring results.

○ No outfalls were inspected

◉ The above referenced outfall screening data is attached to the email submission

○ The above referenced outfall screening data can be found at the following publicly available website:

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

Number of outfalls screened: 44

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

Percent of outfalls screened: 100

Optional: Provide additional information regarding your outfall/interconnection screening:

In Permit Year 6, the Town completed screening for all known mapped MS4 outfalls.

Catchment Investigations

If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.

- (•) No catchment investigations were conducted
- ( ) The catchment investigation data is attached to the email submission
- ( ) The catchment investigation data can be found at the following publicly available website:

*Below, report on the number of catchment investigations completed **during this reporting period**.*

Number of catchment investigations completed this reporting period: 0

*Below, report on the percent of catchments investigated **to date.***

Percent of total catchments investigated: 0

Optional: Provide any additional information for clarity regarding the catchment investigations below:

Completing outfall investigations was the top priority for the Town this permit year. The Town will begin working through catchment investigations in Permit Year 7.

IDDE Progress

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- (•) No illicit discharges were found
- ( ) The illicit discharge removal report is attached to the email submission
- ( ) The illicit discharge removal report can be found at the following publicly available website:

*Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed **during this reporting period.***

Number of illicit discharges identified: 0

Number of illicit discharges removed: 0

Estimated volume of sewage removed: 0 gallons/day

Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed ***since the effective date of the permit (July 1, 2018)****.*

Total number of illicit discharges identified: 0

Total number of illicit discharges removed: 0

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

Employee Training

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

An MS4 program employee training was conducted for 20 DPW employees that covered topics such as the DPW Facility's SPCC Plan, IDDE & Good Housekeeping practices.
In addition, the DPW GIS Coordinator/MS4 Compliance Manager attended the following trainings during Permit Year 6:
- Stormwater Data Management: Using GIS in Municipal Asset Management; Asset Mapping
- BSR IDDE Training for MS4 Permitting Workshop (UMTC/Baystate Roads)
- Stormwater Retrofits for Meeting MS4 Treatment Requirements (UMTC/Baystate Roads/VHB) - Attended by the DPW Director as well.

MCM4: Construction Site Stormwater Runoff Control

Below, report on the construction site plan reviews, inspections, and enforcement actions completed ***during this reporting period****.*

Number of site plan reviews completed: 3

Number of inspections completed: 3

Number of enforcement actions taken: 0

Optional: Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

Similar to previous permit years, there were no formal enforcement actions, which are only needed if corrective action are not completed as requested.

MCM5: Post-Construction Stormwater Management in New Development and Redevelopment

Ordinance or Regulatory Mechanism

Date update was completed (due in year 3):	June 28, 2024
Website of ordinance or regulatory mechanism:	https://www.bellinghamma.org/DocumentCenter/View/1553/Procedural-Rules-For-The-Planning-Board-PDF

As-built Drawings

*Below, report on the number of as-built drawings received **during this reporting period**.*

Number of as-built drawings received: 0

Optional: Enter any additional information relevant to the submission of as-built drawings:

Street Design and Parking Lots Report

Below, describe any changes made or planned to be made to local regulations and guidelines based on the report completed in Year 4:

N/A - proposed recommendations are not proposed until future permit years

Green Infrastructure Report

Below, describe progress towards making green infrastructure practices allowable based on the report completed in Year 4:

N/A - proposed recommendations are not proposed until future permit years

Retrofit Properties Inventory

Below, list remaining permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas (must maintain a minimum of 5 sites in inventory until less than 5 sites remain):

1. 26 Pearl Street
2. 0 Hartford Avenue (incorrectly listed in PY4 AR as 292 Hartford Ave)
3. 0 Depot St - Parcel 0033-0002-0000
4. Depot St across from 215 St - Parcel 0038-0023 (part), soon to be town-owned.
5. 2 & 10 Mechanic Street

Prioritization of these sites is subject to change based on available funding and further feasibility assessment, design, and permitting of projects. The Town has a short-list of alternative sites if one of these 5 sites is less desirable.

Below, list all properties that have been modified or retrofitted with BMPs to mitigate impervious area that were inventoried as part of 2.3.6.d of the permit and the type of BMP(s) implemented. Non-MS4 owned properties that have been modified or retrofitted with BMPs to mitigate impervious area may also be listed, but must be indicated as non-MS4.

South Main Street, Roadway Improvement Project: Retrofit complete with detention basin near the intersection of South Main Street and Blackstone Street.

MCM6: Good Housekeeping

Catch Basin Cleaning

Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins ***during this reporting period****.*

Number of catch basins inspected: 302

Number of catch basins cleaned: 2,009

Total volume or mass of material removed from all catch basins: 242 tons

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

Total number of catch basins: 2,332

If applicable:

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

All catch basins are visually inspected at the time of cleaning; however only 302 inspections were logged in

PeopleGIS in PY6.

These totals may include catch basins outside of the urbanized area.

Street Sweeping

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

- (●) Number of miles cleaned: 551.3
- ( ) Volume of material removed: [Select Units]
- ( ) Weight of material removed: [Select Units]

Stormwater Pollution Prevention Plan (SWPPP)

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

Number of site inspections completed: 6

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

DPW riprap swale needed maintenance and was completed in Q1. The Town noted ongoing cleaning and maintenance needs throughout PY6 and will confirm all these actions were completed. Moving forward, the Town plans to note corrective actions completed in more detail. Quarter 3 inspection was missed.

Additional Information

Monitoring or Study Results

Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.

- (●) Not applicable
- ( ) The results from additional reports or studies are attached to the email submission
- ( ) The results from additional reports or studies can be found at the following publicly available website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

Additional Information

Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above.

MCM6 - Sweeping: there are approximately 101 miles of road in Bellingham. The miles of sweeping reported are in lane miles driven by the sweeper.

A Spill Prevention Control and Countermeasure (SPCC) program was setup, trained and implemented at the DPW. An underground storage tank was replaced with an aboveground diesel tank with new stormwater drainage. A Primary contact and Secondary contact were assigned for any potential spills. On-site storage at the garage is also inspected monthly and notifications are posted readily accessible to staff and others.

Year 7

Activities Planned for Next Reporting Period

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 7 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree ☒

- Complete investigations of catchments associated with Problem Outfalls
- Complete investigations of catchments where any information gathered on the outfall/interconnection identifies sewer input

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all curbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities

- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary
- Review O&M programs for all permittee owned facilities; update if necessary
- Implement all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implement program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Enclose all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- Review as-built drawings for new and redevelopment to ensure compliance with post construction bylaws, regulations, or regulatory mechanism consistent with permit requirements
- Inspect all permittee owned treatment structures (excluding catch basins)
- Identify additional permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious areas so that the permittee maintains a minimum of 5 sites in their inventory, until such a time when the permittee has less than 5 sites remaining

Provide any additional details on activities planned for permit year 7 below:

The Town acknowledges the General Permit Year 7 requirements and will complete as many activities as possible based on funding and staff availability.

Part V: Certification of Small MS4 Annual Report 2024

40 CFR 144.32(d) Certification

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

Name: Jesse Riedle

Title: Director of Public Works

Signature: Jesse Riedle

Date: 9/26/2024

[Signatory may be a duly authorized representative]

SSO Inventory for Bellingham, MA – Permit Year 6 Update

Summary table:

Date	Time	Location	Discharge to surface water or MS4	Estimated SSO Volume	Cause of SSO	Mitigation/Corrective Measures Completed
8/2/2018	8:00 PM	Wrentham Manor	No	2,000 Gallons	Pump/Lift Station Failure	See detailed descriptions below
6/3/2023	6:31 PM	77 Cross Street	No	600 Gallons	Pump/Lift Station Failure	
9/12/2023	9:52 AM	77 Cross Street	No	150 Gallons	Pump/Lift Station Failure	

Detailed descriptions:

- On **August 2nd, 2018** at approximately 8:00 PM, the Sewer Department was notified of sewage coming out of a manhole at Wrentham Manor (Wrentham Road). After responding and investigating, it was discovered that the pump/lift station failed and that the Mission Dialer failed to call out the alarms. The total volume of wastewater discharged to groundwater was approximately 2,000 gallons (no receiving water was impacted). Town staff repaired both pumps and investigated pump changes to eliminate clogging. The town is working with an electrician to get an alarm if power is lost due to mission dialer unit.

- **No SSOs in 2019, 2020, 2021, or 2022.**

- On **June 3rd, 2023** at approximately 6:31 PM, the Sewer Department noticed sewage coming out of a manhole near 77 Cross Street which connects to the sewer pump station. Crews arrived on site and started running the pump station manually which lowered the well and stopped the SSO by 7:30 PM. Crews had to monitor the station overnight until Veolia arrived on site to help vactor down the wet well. To continue to run the pump station without causing another SSO, Veolia was called on site to vactor the pump station wet well as needed to avoid another SSO. A contractor was hired to repair the station.

- On **September 12th, 2023** at approximately 9:52 AM, a DPW employee noticed sewage discharging out of a manhole near 77 Cross St, located in front of the sewer pump station. It was discovered that the control power for the station was turned off. The employee switched the breaker on, which initiated pumping and lowered the wet well, ultimately stopping the SSO. Pump 1 was out for repairs and once the station was fully operational, it was closely monitored. An outside contractor inspected the sewer station to ensure nothing was missed.

Massachusetts Department of Environmental Protection
Bureau of Water Resources– Wastewater Management Program

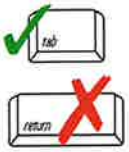
Sanitary Sewer Overflow (SSO)/Bypass Notification Form

FOR DEP USE ONLY

Tax Identification Number

A. Reporting Facility

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Facility Information

Woonsocket Regional Wastewater Commission — Reporting Sewer Authority
RI041091 — Permit #

2. Authorized Representative Transmitting Form:

Dominic — First Name
Mancini — Last Name
508-966-5813 — Telephone No.
Facilities Supervisor — Title
DMancini@bellinghamma.org — E-mail Address

B. Phone Notifications:

See DEP Regional Office telephone and fax numbers at the end of this form.

1. **MassDEP staff** contacted: Andrea (first name) Briggs (last name)
   Date/Time contacted: 9/12/2023 (Date) 2:20 (Time) ☐ am ☒ pm
2. **EPA staff** contacted: Doug (first name) Koopman (last name)
   Date/Time EPA contacted: 9/12/2023 (Date) 2:30 (Time) ☐ am ☒ pm
3. Board of Health contacted: Vincent (First Name) Forte (Last Name)
   Date/Time contacted: 9/12/2023 (Date) 2:43 (Time) ☐ am ☒ pm
4. Others notified (select all that apply); ☒ Conservation Commission

☐ Harbormaster ☐ Shellfish Warden ☐ Division of Marine Fisheries

☐ Downstream Drinking Water Supplier ☐ Watershed Association

☐ Beach Resource Manager ☐ Other: DPW Director & emails listed on DEP site (specify)

C. SSO Information

1. SSO Discovered: 9/12/2023 (Date) 9:52 (Time) ☒ am ☐ pm
   By: DPW employee in the area
2. SSO Stopped: 9/12/2023 (Date) 10:07 (Time) ☒ am ☐ pm
3. SSO Discharge from: ☒ Sanitary Sewer Manhole ☒ Pump Station

☐ Backup into Property ☐ Other: Manhole infront of the sewer pump station (specify)

4. SSO Discharge to: ☒ Ground Surface (no release to surface water)

☐ Direct to Receiving Water — Towards Peters River (surface water)

☐ Catch basin to Receiving Water — (surface water)

☐ Backup into Property Basement

Massachusetts Department of Environmental Protection
Bureau of Water Resources– Wastewater Management Program

Sanitary Sewer Overflow (SSO)/Bypass Notification Form

FOR DEP USE ONLY

Tax Identification Number

C. SSO Information (cont.)

Location: Manhole opposite 77 Cross St, Bellingham MA
(Description of discharge site or closest address)

5. Estimated SSO Volume at time of this Report: 5-10gpm

Method of Estimating Volume: Visual

6. Cause of SSO Event:

☐ Rain Event ☒ Pump Station Failure ☐ Insufficient Capacity in System

☐ Treatment Unit failure

☐ Sewer System Blockage: ☐ Pipe Collapse ☐ Root Intrusion ☐ Grease Blockage

☐ Other: (Specify)

7. Corrective Actions Taken:

DPW staff onsite, over looked the station and found the control power was off, turned breaker ON, station started pumping imediately, lowering the wet well and stopping the SSO

Impact Area cleaned and/or disinfected: ☒ Yes ☐ No

We checked the area and confirmed that this SSO was water only, no solids

Corrective Actions Completed: ☒ Yes ☐ No

We had an outside contractor inspect sewer station incase something was missed. We are monitoring station closely.

D. Comments/Attachments/Follow-up

I wish to provide (select all that apply):

☐ Attachment ☒ Additional comments below: ☐ No additional comments or attachments

Additional comments and planned actions:

Pump 1 is out for repairs. Once this station is fully operational we are going to monitor it closely.

Massachusetts Department of Environmental Protection
Bureau of Water Resources– Wastewater Management Program

Sanitary Sewer Overflow (SSO)/Bypass Notification Form

FOR DEP USE ONLY

Tax Identification Number

E. Certification Statement

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, 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.

Signature of Authorized Representative

9/14/23
Date Signed

Please keep a copy of this report for your records. When submitting additional information, include the MassDEP Incident Number from this report.

MassDEP Regional Office and EPA Telephone and Email addresses:

Northeast Region	Phone: 978-694-3215	Massdep.nerowastewater@mass.gov
Southeast Region	Phone: 508-946-2750	Massdep.serowastewater@mass.gov
Central Region	Phone: 508-792-7650	Massdep.cerowastewater@mass.gov
Western Region	Phone: 413-784-1100	Massdep.werowastewater@mass.gov
EPA	Phone: 617-918-1510	
EPA for Southeast Region, David Turin	Phone: 617-918-1598	Turin.david@epa.gov
EPA for Northeast, Central and Western Regions, Douglas Koopman	Phone: 617-918-1747	Koopman.douglas@epa.gov
DEP 24-hour emergency	Phone: 888-304-1133	

Town of Bellingham

PHOSPHORUS CONTROL PLAN (PCP) – PHASE 1

For Charles River Watershed
Phosphorus TMDL

June 2023
Updated June 2024

Tighe&Bond

100% Recyclable

Section 1 Phosphorus Control Plan (PCP) Phase 1

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G. Retrofit Criteria for Priority Ranking of BMPs
H. Operation and Maintenance Standard Operation Procedures
I. Supporting Calculations for Implementation Cost
J. Public Comment Record Keeping
K. Documentation of PCP Implementation

Acknowledgements

Bellingham used the Phase 1 Phosphorus Control Plan (PCP) template developed by the Charles River Watershed Association (CRWA). This template as well as other supporting resources were developed under a Fiscal Year 2021 (FY21) MS4 Municipal Assistance Grant from the Massachusetts Department of Environmental Protection (MassDEP). This grant supports permittees regulated under the U.S. Environmental Protection Agency's (EPA) municipal separate storm sewer system permit (MS4 Permit) in addressing phosphorus reduction requirements in the Charles River watershed and various lakes and ponds throughout Massachusetts. These materials are available at the following URL: https://www.crwa.org/stormwater-regulations.

In 2022, CRWA was awarded a FY23 MS4 Municipal Assistance Grant Program that allowed experts from the University of Vermont Spatial Analysis lab to create updated, high-resolution maps of land use and impervious surfaces across the watershed. The updated land use data was used to estimate Bellingham's current phosphorus loading.

Section 1
Phosphorus Control Plan (PCP) Phase 1

The 2016 National Pollutant Discharge Elimination System General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts ("MS4 Permit" or "the Permit") took effect on July 1, 2018. The Permit was subsequently modified on December 7, 2020; modifications took effect on January 6, 2021. The MS4 Permit conditions the operation, regulation, and management of MS4s in subject Massachusetts municipalities. Terms and conditions include requirements across six Minimum Control Measures (MCMs), and water quality-based effluent limitations (WQBEL), including requirements for waterbodies with approved Total Maximum Daily Loads (TMDLs) and other water quality-limited waters.

There are two approved nutrient TMDLs for the Charles River; one for the Lower Charles River Basin, published in 2007[1], and one for the Upper/Middle Charles River Basin, published in 2011[2]. As an element of the Permit's WQBEL provisions, communities within the Charles River watershed are obligated to address phosphorus impairments through the development and implementation of a Phosphorus Control Plan (PCP).

What is Phosphorus?

Phosphorus is a naturally occurring element present in organic matter. Plants and algae require phosphorus to photosynthesize.

Where does it come from?

Phosphorus enters rivers and other waterbodies naturally through the erosion of rocks and soils and the deposition of organic matter. Today, human activity has caused an excess of phosphorus in the environment. Fertilizer, gas, trash, pet waste and sewage contribute significantly to the phosphorus content in waterbodies, such as the Charles River. These sources of phosphorus are introduced to aquatic ecosystems primarily through stormwater runoff.

Why does it matter?

Increased phosphorus concentrations in waterbodies cause increased plant growth. Algae, cyanobacteria, and aquatic weeds can grow in abundance, altering the aquatic ecosystem. Cyanobacteria, also known as blue-green algae, produce toxins which can be harmful to humans and animals. Increased aquatic plant growth makes river uninhabitable for humans, plants, and wildlife.

Blue-green algae bloom along the banks of the Charles River in Boston.
Source: U.S. EPA. Environmental Challenges for the Charles River.
URL: https://19january2017snapshot.epa.gov/charlesriver/environmental-challenges-charles-river_.html

[1] 2007. Massachusetts Department of Environmental Protection. *Final TMDL for Nutrients in the Lower Charles River Basin. CN 301.1*

[2] 2011. Massachusetts Department of Environmental Protection. *Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River Basin, Massachusetts. CN 272.0*

Appendix F of the 2016 MS4 Permit describes specific requirements of the PCP, implementation of which is anticipated to achieve the TMDL-established targeted phosphorus reductions over a 20-year timeframe. PCP implementation includes structural and non-structural best management practices (BMPs) executed through programs, projects, and policies. The PCP must be fully implemented within 20 years of the Permit effective date (i.e., by 2038), as illustrated in Table 1-1. The targeted phosphorus reductions are broken out into interim mandatory milestones, culminating in achievement of the allowable TMDL phosphorus loads for each municipality at the end of the 20-year schedule.

Table 1-1 General PCP Implementation Timeline for Charles River Watershed Communities

1-5 years after permit effective date **[2018-2023]**	**5-10 years** after permit effective date **[2023-2028]**	**10-15 years** after permit effective date **[2028-2033]**	**15-20 years** after permit effective date **[2033-2038]**
Create Phase 1 Plan	Implement Phase 1 Plan		
	Create Phase 2 Plan	Implement Phase 2 Plan	
		Create Phase 3 Plan	Implement Phase 3 Plan

1.1 Overview of PCP Phase 1 Milestones

Phase 1 of the PCP must achieve the first 25% of each permittee's phosphorus load reduction requirement within 10 years (i.e., by June 30, 2028), with an interim milestone of achieving the first 20% of phosphorus load reduction by Year 8 (i.e., by June 30, 2026). The detailed components of Phase 1 of the PCP are outlined in Table 1-2.

Table 1-2 Phase 1 Component Deadlines

Permit Year	**Year-End** (June 30th)	**PCP Component(s) Due**
Year 1	2019	N/A
Year 2	2020	Legal Analysis *(see Section 1.4, Appendix A)*
Year 3	2021	Funding Source Assessment *(see Section 1.5, Appendix B)*
Year 4	2022	Define PCP Scope/Area, Baseline Phosphorus Load, Phosphorus Reduction Requirement, and Allowable Phosphorus Load *(see Section 1.3)*
Year 5	2023	Descriptions of the following Phase 1 items: - Nonstructural controls *(see Section 1.6)* - Structural controls *(see Section 1.7)* - Operation and Maintenance program for structural controls *(see Section 1.8)* - Phase 1 implementation schedule *(see Section 1.9)* - Phase 1 implementation cost estimate *(see Section 1.10)* - Written Phase 1 PCP

Permit Year	Year-End (June 30th)	PCP Component(s) Due
Year 6	2024	Performance Evaluation and full implementation of nonstructural controls*
Year 7	2025	Performance Evaluation
Year 8	2026	Performance Evaluation and implementation of structural controls to achieve 20% of target phosphorus reduction
Year 9	2027	Performance Evaluation
Year 10	2028	Performance Evaluation and implementation of structural controls to achieve 25% of target phosphorus reduction

* EPA has clarified that the "full implementation of nonstructural controls" requirement in the 2016 MS4 General Permit is due 6 years after the permit effective date in Appendix F Section A.I.1.a.3 "Phase 1 Implementation Schedule" so we have modified this table for Item 1-10 accordingly.

The Town of Bellingham acknowledges that there is significant work to be done to meet the phosphorus reduction deadlines set forth in the MS4 Permit. The Town must plan, allocate funds for, design, and construct structural controls in the initial years of the PCP to meet the Year 8 and Year 10 reduction deadlines. Some controls that rely on local bylaw or regulatory updates, or engaging landowners directly through incentives, may take even longer to implement. This is taken into account in the Phase 1 implementation schedule.

1.2 Watershed and Community Characterization

The Charles River collects water from a total land area of 308 square miles. The River twists and turns on an 80-mile route from Hopkinton, south into Bellingham, and northeast to Boston Harbor. The River flows through 23 communities and the total watershed encompasses 35 communities, adding many political complexities to watershed management. Some 80 brooks and streams, and several major aquifers, feed the Charles River. The watershed contains many lakes and ponds, most of them manmade, many through the construction of dams. The river drops about 350 feet in its unhurried journey to the sea. Lacking speed and force, the slow-moving Charles River is naturally brownish in color, because the water picks up sediment from the abundant wetlands along its path.

The Charles River watershed is home to over a million residents. As an urban river, it is impaired by multiple pollutants and has many areas with altered and degraded habitat. Three TMDLs have been developed for the watershed: two for nutrients and one for bacteria. The river has borne the brunt of much of the development in the greater Boston area through damming, pollution, and disruption from traditional development practices. A nearly five-decade cleanup effort has resulted in water quality improvements, primarily from elimination of industrial discharges and a significant reduction in untreated sewage flowing into the river. The primary challenge facing the river today is stormwater runoff. Phosphorus loading in stormwater runoff is a particular challenge to the river, leading to summertime cyanobacteria blooms and overgrowth of invasive aquatic plants in many areas of the watershed.

The majority of Bellingham is within the 'urbanized area' boundary according to the U.S. Census Bureau and has therefore been required by the Clean Water Act and EPA's Storm Water Phase II Program to maintain a NPDES permit for its stormwater discharges (Figure 1-1). The Town is split between two watersheds: the northern part of Town is in the Charles River watershed, and the southern part is in the Blackstone River watershed (Figure 1-2). Per Appendix F of the 2016 MS4 Permit, the Town must develop a PCP to reduce the amount of phosphorus in stormwater discharges within the Charles River watershed. As seen in Figures 1-1 and 1-2, only a portion of the Charles River watershed overlaps with the Town's MS4 area and therefore the Town may implement the PCP Plan by defining the PCP Area as either the Charlies River watershed or just the MS4 area within the watershed in Town. The selected PCP Area is defined further in Section 1.3.

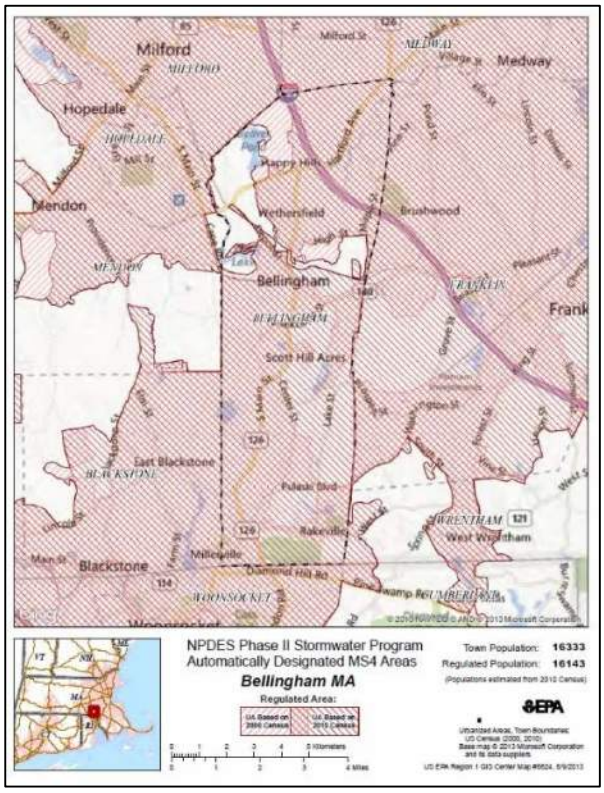


Figure 1-1 Bellingham's MS4 Area

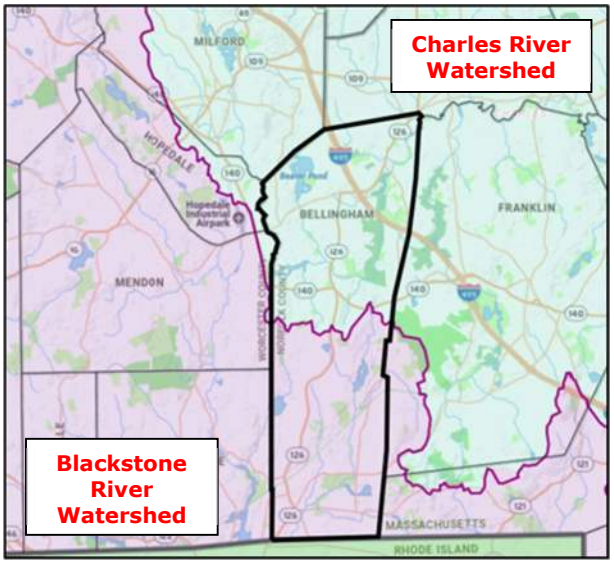


Figure 1-2 Major Watersheds

Over the past decade, the Town of Bellingham has strategically invested in its MS4 program to comply with EPA's requirements and thereby reducing its phosphorus discharges to the Charles River and its tributaries. This included a 604(b) Water Quality Management Planning grant in 2011 from MassDEP where the Town partnered with CRWA along with Nitsch Engineering to produce a Subwatershed Management Plan for the Town Center area of Bellingham. As part of this Plan, conceptual designs for several structural BMPs were developed with estimated costs and expected removal of phosphorus. Additionally, in June 2017, Bellingham applied for and was awarded funds for a 319 Nonpoint Source Competitive Grant from MassDEP. This grant consisted of the final design and construction of an infiltration basin and creation of a landscaped park that reduces 0.31 acres of directly connected impervious cover, at the Town's Municipal Center. The project was completed in 2019 (Figure 1-3).

Figure 1-3 New BMP at Municipal Center

Bellingham's recent investment in its MS4 program and phosphorus reduction efforts includes the implementation of a new stormwater utility fee in 2020, which provides sustainable funding for the Town's Stormwater Management Enterprise Fund. The utility fee

utilizes a credit structure to incentivize property owners to assist the Town in achieving nutrient loading reductions as required by the MS4 permit. The Fund will help meet PCP obligations from Permit Year 1 through 5 by evaluating the costs and benefits of undertaking non-structural and structural stormwater BMPs, as discussed further in Section 1.5 and Appendix B. More information on the Town's stormwater program can be found on the Town's website (https://www.bellinghamma.org/stormwater).

Because of Bellingham's commitment to stormwater management and watershed stewardship, this Phase 1 Plan demonstrates that Bellingham is on track to meet the pollutant reduction milestones through Permit Year 10 and beyond.

1.3 PCP Load Reduction Targets

Appendix F of the MS4 permit requires the Town to determine the scope of implementation for the PCP as well as a baseline phosphorus loading, phosphorus reduction requirement, and allowable phosphorus load. An excerpt from the MS4 permit for this component is as follows:

> *The permittee shall indicate the area in which it plans to implement the PCP. The permittee must choose one of the following: (1) to implement its PCP in the entire area within its jurisdiction (for municipalities this would be the municipal boundary) within the Charles River Watershed; or (2) to implement its PCP only in the urbanized area portion of the permittee's jurisdiction within the Charles River Watershed. The implementation area selected by the permittee is known as the "PCP Area" for that permittee. Table F-2 and Table F-3 list the permittees subject to phosphorus reduction requirements along with the estimated Baseline Phosphorous Loads in mass/yr, the calculated Allowable Stormwater Phosphorus Load in mass/yr, the Stormwater Phosphorus Reduction Requirement in mass/yr and the respective percent reductions necessary. The two tables contain different reduction requirements for each permittee based on the PCP Area they choose (see above). If the permittee chooses to implement the PCP in its entire jurisdiction, the permittee may demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural and non-structural controls on discharges that occur outside the regulated area. If the permittee chooses to implement the PCP in its regulated area only, the permittee must demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural and non-structural controls on discharges that occur within the regulated area only.*
>
> *The permittee shall select the Baseline Phosphorus Load, Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load that corresponds to the PCP Area selected. The selected Stormwater Phosphorus Reduction Requirement and Allowable Phosphorus Load will be used to determine compliance with PCP milestones of this Phase and Phase 2 and Phase 3. ...*

1.3.1 PCP Area, Baseline Phosphorus Load, Allowable Phosphorus Load, and Stormwater Phosphorus Reduction Requirements from MS4

Permittees within the Charles River Watershed were required to define the scope of the PCP known as the "PCP Area" either as 1) within its jurisdiction within the Charles River Watershed; or 2) in the urbanized area portion of the permittee's jurisdiction within the Charles River Watershed, by four years after the permit effective date. The defined PCP

Area is used to determine EPA's set Baseline Phosphorus Load, Allowable Stormwater Phosphorus Load, and Stormwater Phosphorus Reduction Requirement as stated in Appendix F Table F-2 and F-3 of the 2016 MS4 Permit.

The Town of Bellingham has the option to implement its PCP either within the entirety of the community that falls within the Charles River watershed or just the MS4-regulated (urbanized) area of our community within the Charles River watershed. **It was determined that the Town will implement the PCP in the MS4-regulated area within the Charles River watershed.**

The Town of Bellingham is opting to implement the PCP within the MS4-regulated area because it is a smaller load and a smaller, more manageable area. We anticipate having the available space within this area to meet our MS4 Permit phosphorus reduction requirements. During the implementation of the PCP, there will most likely be improvements to stormwater management practices outside of this designated area due to policies and requirements implemented at the municipal scale. We understand that these improvements will not count towards the Town's phosphorus reduction requirement.

The Town will therefore be held to the Allowable Phosphorus Load reported in Table F-3 of the MS4 Permit, which presents the baseline phosphorus load, phosphorus reduction requirement, allowable phosphorus load, and percent reduction in phosphorus load from Charles River watershed when the PCP Area is chosen to be only the urbanized area portion of a permittee's jurisdiction within the Charles River watershed. The Allowable Phosphorus Load reported in Table F-3 is shown in Table 1-3. EPA has also established milestone phosphorus loading goals to help communities phase a reduction program to complete 20% of the required reduction by Year 8 and 25% of the required reduction by Year 10. These milestones are calculated as follows and included in Table 1-3. See Appendix F Section A.I Table F-1 for more details on the Year 8 and 10 milestone equations.

*Year 8 Phos. Export Rate ≤ Allowable Phos. Load + (Phos. Reduction Requirement x **0.80**)*

*Year 10 Phos. Export Rate ≤ Allowable Phos. Load + (Phos. Reduction Requirement x **0.75**)*

Table 1-3 PCP Timeline of Phase 1 Reduction Requirements

Condition	Value
Baseline Phosphorus Load	1,766 lbs/yr (801 kg/yr)
Allowable Phosphorus Load	990 lbs/yr (449 kg/yr)
Stormwater Phosphorus Load Reduction Requirement	776 lbs/yr (352 kg/yr)
Year 8 Milestone: 20% of Reduction	1,609 lbs/yr (730 kg/yr)
Year 10 Milestone: 25% of Reduction	1,572 lbs/yr (713 kg/yr)

This Phase 1 PCP establishes a program to achieve the target of reducing phosphorus loads from Baseline by 157 lbs/yr by Year 8 and by 194 lbs/yr by Year 10. The Town of Bellingham will be planning and implementing structural and non-structural BMPs, updating regulatory mechanisms, evaluating funding mechanisms and costs, and developing its O&M and recordkeeping programs for continued compliance and functionality of all installed BMPs.

1.3.2 Increases or Decreases to Baseline Phosphorus Load Since 2005

The Baseline Load referenced in Table 1-3 above was calculated using land use data from 2005 after removing Massachusetts Department of Conservation and Recreation (DCR) and Department of Transportation (MassDOT) property. The Town's current phosphorus load has changed due to recent updates to land use, land cover and impervious area data, and more detailed phosphorus loading calculations set forth by EPA in Appendix F of the 2016 Permit, as illustrated below.

In 2022, CRWA was awarded a FY23 MS4 Municipal Assistance Grant Program that allowed experts from the University of Vermont Spatial Analysis lab to create updated, high-resolution maps of land use and impervious surfaces across the watershed. The updated land use data was used to estimate Bellingham's current phosphorus loading.[3] Changes to the land use between 2005 and 2023 is summarized in Table 1-4.

Table 1-4 Bellingham Land Use Changes

Land Use Group	Total Area (acres)		
	2005 Land Use	2023 CRWA Mapping	Change in Area since 2005
Commercial	232	330	98
Industrial	235	249	13
High Density Residential	377	276	-101
Medium Density Residential	333	435	102
Low Density Residential	373	615	242
Highway	29	12	-17
Forest	2919	2635	-284
Open Land	254	228	-26
Agriculture	64	46	-18
Total Land Area	**4,816**	**4,826**	**10**
Water	30	20	-10
Total Area	**4,846**	**4,846**	**0**

The updated land use data was used to help determine possible increases or decreases to baseline phosphorus loads since 2005. The CRWA impervious area delineation, upon visual investigation, under-counted Bellingham's impervious area. Therefore, impervious area data for this calculation was supplemented with a more accurate dataset from the Town of Bellingham from 2023 (impervious area data/imagery from NearMap). Utilizing these updated datasets, the Town of Bellingham's current phosphorus load was calculated and it was determined that the load has decreased from the Baseline Load of 1,766 lbs/yr (801 kg/yr) to 1,467 lbs/yr (660 kg/year), as summarized in Table 1-5. See Appendix C for Town's current phosphorus loading calculations. As land use, development, and impervious cover continue to change, phosphorus load information will be updated.

[3] 2023. Updated Land Use and Impervious Cover Dataset for the Charles River Watershed (unpublished raw data). *Charles River Watershed Association & University of Vermont Spatial Analysis Laboratory.*

Table 1-5 PCP Timeline of Phase 1 Reduction Requirements – 2023 Land Use Update

Condition	Value
Baseline Phosphorus Load (2005)	1,766 lbs/yr (801 kg/yr)
Allowable Phosphorus Load	990 lbs/yr (449 kg/yr)
Stormwater Phosphorus Load Reduction Requirement	776 lbs/yr (352 kg/yr)
Current Stormwater Phosphorus Load (2023)	**1,467 lbs/yr (666 kg/yr)**
Year 8 Milestone: 20% of Reduction	1,609 lbs/yr (730 kg/yr)
Year 10 Milestone: 25% of Reduction	1,572 lbs/yr (713 kg/yr)

As a result of this updated analysis, it was determined that
Bellingham has already met its Year 10 goal of 1,572 lbs/yr (713 kg/yr)
based on the current 2023 phosphorus loading of 1,467 lbs/yr (660 kg/yr).

An assessment of the phosphorus loading sources was completed for Bellingham. Using the updated land use and impervious cover datasets discussed above, the phosphorus loading was determined for each land use type. Over one-third of the phosphorus loading is from commercial and industrial properties, as displayed in Figure 1-4. Forested land also accounts for approximately one-quarter of the phosphorus loading. Future phosphorus reduction efforts can be focused in these areas.

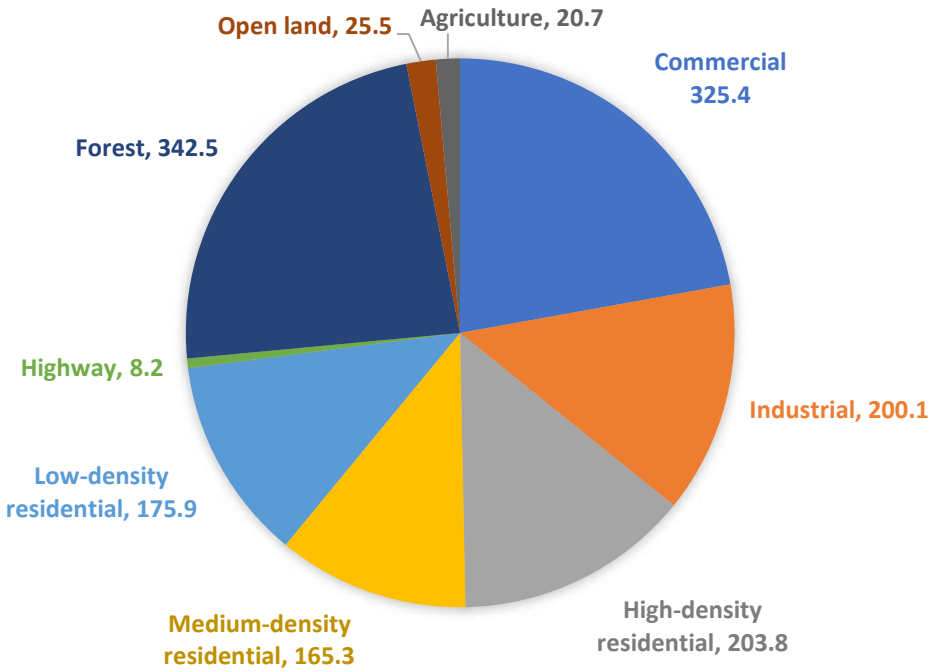


Figure 1-4 Annual Phosphorus Load by Land Use Category (lbs/yr)

1.4 Legal Analysis

Appendix F of the MS4 Permit requires the Town of Bellingham to develop and implement an analysis that identifies existing regulatory mechanisms available to the MS4 such as bylaws and ordinances and describes any changes to regulatory mechanisms that may be necessary to effectively implement the entire PCP (termed by EPA as a "Legal Analysis"). This may include the creation or amendment of financial and regulatory authorities. The Town of Bellingham's Legal Analysis is included in Appendix A.

Key takeaways include the following:

- **Public Property:** The Town has authority to undertake all structural and non-structural controls on public property and no legal changes are necessary to implement the PCP.
- **Private Property:** The Town has multiple avenues to implement the PCP on private property, including through the Planning Board Regulations and Procedural Rules, Stormwater Management Regulations, Wetlands Regulations, and other permitting processes; through the Town's Stormwater Utility Credit Policy; and potentially through EPA's Residual Designation Authority (RDA) proposed for private properties within the Charles River watershed. Possible changes to local code to further implement the PCP on private property includes potentially reducing the threshold by which a project would be reviewed through local code and changing requirements in Zoning that result in the creation of impervious cover.

June 2024 Update: The Planning Board adopted updated Procedural Rules on June 27, 2024 for consistency with the MS4 2016 General Permit requirements and anticipated Stormwater Handbook updates. The final Procedural Rules are available on the Planning Board website.

1.5 Funding Source Assessment

Appendix F of the MS4 Permit requires the Town of Bellingham to describe known and anticipated funding mechanisms (e.g., general funding, enterprise funding, stormwater utilities) that will be used to fund PCP implementation (the "Funding Source Assessment"). The Town of Bellingham must describe the steps it will take to implement its funding plan. This may include but is not limited to conceptual development, outreach to affected parties, and development of legal authorities.

The Town of Bellingham's Funding Source Assessment, developed in 2018, is included in Appendix B. A key takeaway from the assessment is that the Town has completed multiple studies to determine the cost of implementing the PCP and meeting the phosphorus reduction requirements. Projected costs vary from $7.5M to almost $30M total for structural BMPs over the 20-year PCP planning and implementation period. For planning purposes, a minimum annual budget of $200,000 was recommended for installation of BMP retrofits for the first 10 years of the PCP. Note that some of the information included in Appendix B may be outdated based on the 2021 MS4 permit modifications (adopted 2021), the decrease to the baseline phosphorus loading discussed in Section 1.3.2, and the stormwater utility fee adopted in 2020. Therefore, the Funding Source Assessment should be reevaluated.

The Town of Bellingham implemented the Stormwater Enterprise Fund in August 2020. The Stormwater Enterprise Fund is funded by a stormwater utility fee, and had $928,169

in retained earnings for Fiscal Year 2024. As part of the Stormwater Enterprise Fund, the Town developed a credit policy, which aims to incentivize the implementation of phosphorus reduction strategies on private properties. This will hopefully reduce the financial burden placed on the Town to achieve permit compliance.

In 2024, the Town was awarded a MassDEP AMP grant, which includes reviewing the current enterprise fund fees and budget.

1.6 Non-Structural Controls

Appendix F of the MS4 permit requires the Town to determine what types of non-structural stormwater control measures can be implemented to achieve the phosphorus reduction requirements. An excerpt from the MS4 permit for this component is as follows:

> *The permittee shall describe the non-structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-1. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation in units of mass/yr. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F.*

The Town of Bellingham's approach for non-structural BMP implementation for PCP compliance is detailed in this section.

1.6.1 Current Non-Structural BMPs

Non-structural BMPs include actions such as street sweeping, catch basin cleaning, and an organic waste and leaf litter collection program. The Town of Bellingham is currently implementing the non-structural BMPs of catch basin cleaning and street sweeping, which can qualify for phosphorus reduction credits. Phosphorus reduction credits were calculated using the updated phosphorus load export rates reported in Attachment 2 to Appendix F, and the results are included in Table 1-6 below. These credits will count towards the required phosphorus reduction outlined in Section 1.3. Current non-structural BMPs are those that are anticipated to continue at current resource levels, or 'business as usual'. The information presented in Table 1-6 is further detailed in Appendix D and the Town's Stormwater Management Plan (SWMP).[4]

All catch basins within the Charles River watershed in Bellingham are cleaned to keep catch basin sumps less than 50% full. The phosphorus credit achieved by current catch basin cleaning practices was calculated using the impervious area within the MS4 and Charles River watershed areas, broken up by land use category. This assumes that all stormwater runoff on impervious surfaces drains to catch basins. Total Annual P-Reduction values for this current catch basin cleaning practice is provided in Table 1-6 and calculations are included in Appendix D.

The DPW currently sweeps approximately 540 acres of municipal streets and parking lots within the Charles River Watershed using a mechanical broom sweeper twice a year. Approximately 50 of these acres are parking lots. The phosphorus credit achieved by current street sweeping practices was calculated totaling up the areas swept within the MS4 and Charles River Watershed areas, broken up by land use category. Total Annual

[4] 2019. Stormwater Management Plan (SWMP). *The Town of Bellingham.*

P-Reduction values for the Town's current street sweeping practices are provided in Table 1-6 and Appendix D.

The Town of Bellingham manages leaf litter and grass clippings on municipal properties as needed. The Town does not document the quantity or frequency of cleanup, so they do not qualify for phosphorus reduction credit at this time.

Table 1-6 Existing Non-Structural BMPs

Existing Non-Structural BMP	Implementation Levels (schedule, equipment, BMP details)	Total Annual P-Reduction
Street Sweeping	Municipal streets and parking lots are swept twice a year with a mechanical broom sweeper	10 lbs/yr (5 kg/yr)
Catch Basin Cleaning	Municipal CBs cleaned every other year as preventative practice to keep CBs less than 50% full	17 lbs/yr (8 kg/year)
Leaf Litter Program	N/A	N/A
Total Existing Non-Structural Credit		**27 lbs/yr (12 kg/yr)**

The existing non-structural controls contribute 27.0 lbs/yr (12.2 kg/yr) to the phosphorus reduction requirement of 776 lbs/yr (352 kg/yr). Bellingham has already met its Year 8 and Year 10 phosphorus reduction goals of 1,609 lbs/yr (730 kg/yr) by 2026 and 1,572 lbs/yr (713 kg/yr) by year 2028 through current non-structural practices and additional reductions achieved from the Town's 2023 updated phosphorus load (see Section 1.3.2). Bellingham's updated total export rate (P_{exp}) is 1,440.0 lbs/yr (653.2 kg/yr), after accounting for the total annual P-reduction from non-structural practices.

1.6.2 Planned Non-Structural BMPs

The Town should continue to implement the current non-structural BMPs, using, at a minimum, the techniques and frequency described in this Section. Since the Town already has met its phosphorus reduction requirements through Phase 1 of the PCP, it does not have any immediate plans to implement any new or enhanced non-structural practices.

1.7 Structural Controls

Appendix F of the MS4 permit requires the Town to determine what types of structural stormwater control measures can be implemented to achieve the phosphorus reduction requirement and develop a priority ranking for locations where the controls can be implemented. An excerpt from the MS4 permit for this component is as follows:

> *The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of structural phosphorus controls during Phase 1. The ranking shall be developed through the use of available screening and monitoring results collected during the permit term either by the permittee or another entity and the mapping required pursuant to part 2.3.4.6 of the Permit. The permittee shall also include in this priority ranking a detailed assessment of site suitability for potential phosphorus control measures based on soil types and other factors. The permittee shall coordinate this activity with the requirements of part 2.3.6.8.b of the*

Permit. A description and the results of this priority ranking shall be included in Phase 1 of the PCP. The permittee shall describe the structural stormwater control measures necessary to support achievement of the phosphorus export milestones in Table F-1 [of Appendix F of the MS4 Permit]. The description of structural controls shall include the planned and existing measures, the areas where the measures will be implemented or are currently implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party may be included in a municipal PCP. Annual phosphorus reductions from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F.

The Town of Bellingham utilizes **structural BMPs** to detain, treat, and better manage runoff from areas of impervious surface, such as roads, parking lots, or rooftops. Structural BMPs include infiltration trench, infiltration basin or other surface infiltration practice, bio-filtration practice, gravel wetland system, porous pavement, wet pond or wet detention basin, dry pond or detention basin, dry water quality swale/grass swale, etc. **Semi-structural BMPs** are more passive stormwater management approaches that can still produce excellent water quality benefits such as rainwater harvesting, impervious area disconnection, conversion of impervious area to pervious area, and enhancement of pervious areas. For the purposes of this document, the term "structural controls" refers to both structural and semi-structural BMPs.

Structural BMPs historically have been incorporated into the Town of Bellingham via stormwater compliance projects for public and private development projects, using various sources of grant funding, and as part of our capital infrastructure program. Structural BMPs presently in place are evaluated in Section 1.7.1.

Our planning in support of PCP development determined that an investment in structural BMPs, by certifying operation and maintenance of existing municipally owned and privately owned BMPs, will be required to achieve the required 20-year phosphorus reduction for the Town. However, the Town has already met its targeted Phase 1 goals, and it is not required to invest in structural controls during Phase 1 implementation to remain in compliance. In future phases of the PCP, Bellingham plans to claim phosphorus removal from existing municipal and privately owned BMPs. Note that taking credit for existing structural BMPs will require a formal operation and maintenance plan and certification of routine BMP maintenance, as further discussed in Section 1.7.1.

The following sections present a preliminary assessment of current structural BMPs (those that were already built or will be built prior to development of this PCP) and planned structural BMPs (those that were newly identified for PCP compliance or will be implemented after this written PCP is submitted).

1.7.1 Current Structural BMPs

The Town of Bellingham already employs a mix of regulatory and capital improvement programs to implement structural BMPs. During development of the PCP, 52 constructed structural BMPs, privately and municipally owned, were identified in Bellingham within the urbanized area of the Charles River watershed. Table 1-7 provides a summary of the types of existing structural BMPs in Bellingham.

Table 1-7 Summary of Current Structural Controls

Structural BMP Type	Number of BMPs
Detention Pond	39
Infiltration Basin	13

One of the recently installed infiltration basins, located at the Town's Municipal Center, is highlighted in Section 1.7.1.1, including relevant phosphorus reduction information. However, *since the Town has already met their phosphorus reduction goals through Phase 1 of the PCP, the annual phosphorus reduction from the remaining existing structural BMPs will be calculated during Phase 2 of the PCP.*

The Town is required to institute a formal operation and maintenance program to receive phosphorus reduction credits from structural BMPs, as defined by Appendix F, to certify these systems are being maintained to function as designed. Operation and maintenance programs will be finalized during Phase 2 of the PCP so the Town can claim the phosphorus reduction credits for the structural BMPs.

1.7.1.1 10 Mechanic Street

The Town of Bellingham received 319 grant from the federal Clean Water Act, Section 319 to design and construct an infiltration basin and associated pre-treatment sediment forebay to reduce directly connected impervious cover at 10 Mechanic Street, which is the Town's Municipal Center (Project #18-05/319). This project also included demolition of the old police building and the installation of a landscaped park at this address to further reduce impervious cover. The site layout is shown in Figure 1-5. Before the construction of this BMP, stormwater runoff from the Municipal Center parking area discharged to the Charles River watershed without treatment. This stormwater BMP now manages 0.92 acres of impervious area, and the landscaped park reduced 0.31 acres of impervious cover. The annual phosphorus reduction achieved from this BMP was calculated to be 1.4 lbs/year. Excerpts from the final project report are included in Appendix E, including information regarding the stormwater improvements implemented at 10 Mechanic Street, the operation and maintenance program documentation, and phosphorus loading calculations.

Figure 1-5 Municipal Center BMPs and Impervious Cover Reduction Overview
(Aerial view courtesy of Bing Maps, 2023)

1.7.2 Planned Structural BMPs

The Town identified five properties for potential structural retrofits to further reduce the Town's phosphorus load reduction as part of the Town's Stormwater Management Program.[5] A high-level BMP suitability assessment was completed to develop an initial priority ranking of municipal properties that may be suitable for a BMP retrofit opportunity. The assessment included the following steps to evaluate site suitability and feasibility:

- Desktop assessment to develop a preliminary list of feasible Town sites;
- Initial screening of properties in ArcGIS to determine site characteristics;
- Numerical ranking in Microsoft Excel of properties based on site characteristics; and
- Incorporating Town input on potential retrofit opportunities throughout Town and planned capital projects (e.g., planned renovation of municipal buildings, recently completed and planned capital projects and infrastructure improvement projects).

Appendix G includes a summary of the BMP retrofit assessment completed and the criteria utilized in the analysis. While the BMP retrofit analysis considered land parcels throughout

[5] 2022. Year 4 Annual Report; Massachusetts Small MS4 General Permit. *The Town of Bellingham.* 2023. Year 5 Annual Report; Massachusetts Small MS4 General Permit. *The Town of Bellingham.*

the entire Town, locations within the Charles River watershed were prioritized. The top 5 properties that could be retrofitted with a structural BMP are included below in Table 1-8.

Table 1-8 BMP Retrofit Analysis Results within the Charles River Watershed

Property	Description
Demolished mill building (26 Pearl Street)	Restore the site's existing basin to its full potential to provide the opportunity to remove phosphorus loading.
Across from Arrowhead Road (0 Hartford Avenue)	Basin to be constructed as part of roadway improvement project.
Town Open Space (0 Depot Street)	Opportunity for two BMPs, parcel is a large area disjointed along Depot Street
Municipal Center Complex (2 & 10 Mechanic Street)	Upcoming construction for road entrance to Town Hall may provide opportunity for retrofit.

Bellingham will continue to refine this ranking throughout Phase 1 of the Phosphorus Control Plan to identify the most beneficial locations for the installation of structural BMPs. Sites would need to be re-evaluated as part of Phase 2 of the PCP to determine the final feasibility of implementing a retrofit project.

1.8 Operation and Maintenance (O&M) Program for All Existing and Planned Structural BMPs

Appendix F of the MS4 permit requires the Town to describe the O&M Program for structural control measures being claimed for the phosphorus reduction. An excerpt from the MS4 permit for this component is as follows:

> *The permittee shall establish an Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part of Phase 1 of the PCP. This includes BMPs implemented to date as well as BMPs to be implemented during Phase 1 of the PCP. The Operation and Maintenance Program shall become part of the PCP and include: (1) inspection and maintenance schedule for each BMP according to BMP design or manufacturer specification and (2) program or department responsible for BMP maintenance.*

Bellingham has developed a *Structural Stormwater Best Management Practices Inspections & Maintenance* Standard Operating Procedure (SOP) as part of the Town's June 2020 *Good Housekeeping and Pollution Prevention Operations and Maintenance Plan*. The SOP is included in Appendix H. The SOP includes inspection and maintenance requirements for various BMP types, consistent with guidance and schedules in the Massachusetts Stormwater Handbook. The Town also develops site-specific operation and maintenance plans for stormwater BMPs as needed, as shown in the Municipal Center BMP documentation in Appendix E. Bellingham Department of Public Works is responsible for maintaining municipal BMPs.

Private BMPs must be maintained in accordance with the Bellingham Planning Board's Procedural Rules and the site's O&M Program. As required by Section 7.8.3 of the Procedural Rules, each O&M Plan should include a maintenance agreement with "a Maintenance Schedule for all drainage structures, including swales and ponds." In June

2024, the Town enhanced the provisions for long-term O&M of private BMPs in Section 7.7 and 7.8 of the Procedural Rules.

Any supplemental BMP operation and maintenance information needed will be finalized during Phase 2 of the PCP so the Town can claim the phosphorus reduction credits for the structural BMPs which includes and is not limited to an operation and maintenance certification program from private BMPs.

1.9 Phase 1 Implementation Schedule

Appendix F of the MS4 permit requires that a schedule be developed for the implementation of the planned BMPs identified in this PCP. An excerpt from the MS4 permit for this component is as follows:

> *A schedule for implementation of all planned Phase 1 BMPs, including, as appropriate: obtaining funding, training, purchasing, construction, inspections, monitoring, operation and maintenance activities, and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the Phase 1 Plan, and all non-structural BMPs shall be fully implemented within six years of the permit effective date. Structural BMPs shall be designed and constructed to ensure the permittee will comply with the 8 and 10 year phosphorus load milestones established in Table F-1 The Phase 1 plan shall be fully implemented as soon as possible, but no later than 10 years after the effective date of permit.*

The Town of Bellingham has not prepared a detailed implementation schedule for Phase 1 of the PCP, since the Town's phosphorus reduction goals have already been met through year 10 (See Section 1.3.2 and 1.6). As of the date of this plan, Bellingham's updated total export rate (P_{exp}) is 1,440.0 lbs/yr (653.2 kg/yr), after accounting for the total annual P-reduction from non-structural practices. Therefore, by comparing P_{exp} with the 2005 Baseline, the Town is currently reducing approximately 326 lbs/yr (147.9 kg/yr) of phosphorus, or 42% of the 776 lbs/yr load reduction required. Figure 1-6 depicts Year 8, 10, and 15 phosphorus reduction goals and the target phosphorus load for the Town of Bellingham, as well as the 2005 and current baseline phosphorus loads and current total export rate (P_{exp}).

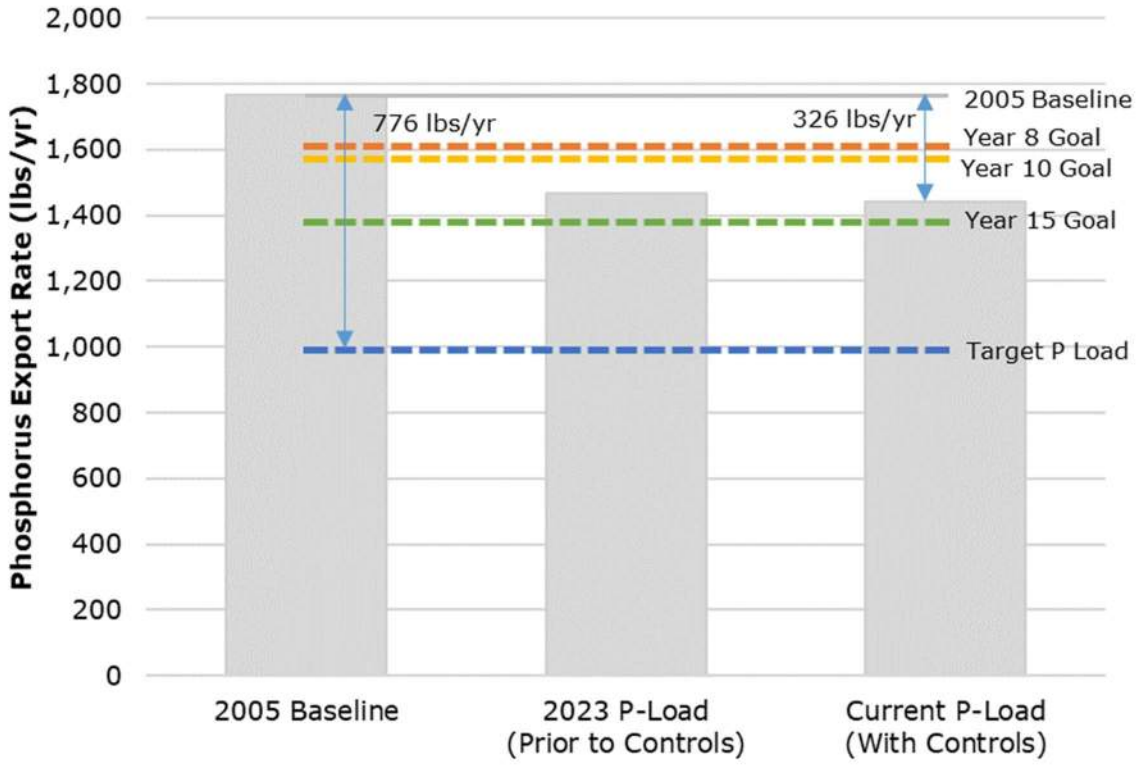


Figure 1-6 Bellingham's Phosphorus Reduction Goals

By the end of Phase 1, the Town should estimate the phosphorus load reduction from structural BMPs and be able to certify O&M so these credits are counted in Phase 2.

The Town will develop an implementation schedule over the coming years to stay on track and continue to meet subsequent phosphorus reduction goals in Phases 2 and 3 of the PCP. The future focus of an implementation plan will include updates to the existing structural BMP O&M Program and ongoing installation of structural BMPs. Other components of the implementation plan will be refined in subsequent years as the needs of the Town and its stormwater plan grow and as year 10 approaches.

1.10 Estimated Cost for Implementing Phase 1 of the PCP

Appendix F of the MS4 permit requires that the cost and anticipated funding for implementing Phase 1 of the PCP be estimated. An excerpt from the MS4 permit for this component is as follows:

> *The permittee shall estimate the cost of implementing the Phase 1 non-structural and structural controls and associated Operation and Maintenance Program. This cost estimate can be used to assess the validity of the funding source assessment completed by year 3 after the permit effective date and to update funding sources as necessary to complete Phase 1.*

Bellingham has developed an estimated cost to implement Phase 1 of the PCP. This cost estimate is included in Appendix I and includes the cost associated with continuing the Town's existing non-structural control programs for Years 6 to 10. In 2023, the catch basin

cleaning program cost the Town $86,614 and the average annual street sweeping cost $196,000 as of 2019. Between Permit Year 6 and Permit Year 10, the Town anticipates spending an approximate total of $452,000 on catch basin cleaning and $946,000 on street sweeping, which amounts to $280,000 in annual costs. This cost estimate is included in Appendix I and additional details are available from the Town's Department of Public Works.

The Town anticipates continuing to fund the O&M Program through Stormwater Utility revenue. Since additional structural BMPs are not required to meet Year 8 and Year 10 phosphorus removal goals, the Town does not anticipate needing to fund design and construction of new BMPs. However, as municipal redevelopment projects are implemented, opportunistic BMP retrofits will be considered, and funded through the project's funding source. The estimated cost for an increased O&M Program and/or structural BMPs will be evaluated as part of Phase 2 of the PCP.

1.11 Performance Evaluations

Bellingham will complete the required annual Performance Evaluation in Years 6 through 10 to assess the Town's PCP progress as required by Section 4.4 of the 2016 MS4 General Permit. Documentation of the Land Development Impacts and Phosphorus Credits for this effort will be included in either the Town's Annual Report and/or posted to the Town's stormwater webpage.

1.12 Public Comment and Plan Availability

In order to complete the written Phase 1 Plan of the PCP, Appendix F of the MS4 permit requires that the Town make the Phase 1 Plan available to the public for public comment during Phase 1 Plan development. EPA encourages the Town to post the Phase 1 Plan online to facilitate public involvement.

In conformance with these permit requirements, the Town of Bellingham's written Phase 1 PCP was made available for public comment on the Town's stormwater website. Documentation of public engagement including the location and dates of future public hearings and social media posts will be included in later phases of the Phosphorus Control Plan. Appendix J includes documentation of any public engagement of the Town's Phase 1 PCP.

Section 2
Documentation and Reporting

The most current information for annual updates to the Town of Bellingham's PCP progress can be found in the following appendices:

- For non-structural controls: Appendix D
- For structural controls: Appendix E
- For the operations and maintenance program: Appendix F
- For future priority ranking of BMPs with retrofit criteria Appendix G
- For future implementation planning Appendix I
- For future documentation of the public comment process and comments received Appendix J
- For documentation of PCP implementation Appendix K

This data is also tracked in each year's Annual Report as required by Section 4.4 of the 2016 MS4 General Permit, which are available upon request from the Department of Public Works.

Appendix A
Legal Analysis

Legal Analysis – Phase 1 PCP Components MA MS4 General Permit

TO: Don DiMaritno, Director of Public Works, Town of Bellingham

FROM: Emily Scerbo, PE, Senior Project Manager and Janet S. Moonan, PE, Project Manager

COPY: James Kupfer, MPA, AICP, Town Planner

DATE: June 30, 2020, *updated in January 2021 to reflect Stormwater Utility*

Tighe & Bond is providing this memorandum to document compliance with the "Legal Analysis" requirement of the U.S. Environmental Protection Agency's (EPA) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) in Massachusetts, specifically Appendix F Requirements for Discharges to Impaired Waters with an Approved Total Maximum Daily Load (TMDL), Part A. I. Charles River Watershed Phosphorus TMDL Requirements.

"Legal Analysis" Requirement

According to Appendix F, as part of developing and implementing a Phosphorus Control Plan (PCP) designed to reduce the amount of phosphorus in stormwater discharges from the MS4 to the Charles River and its tributaries, Bellingham must conduct an analysis of local legal authority that may be necessary to effectively implement the entire PCP (termed by EPA as a "legal analysis"). This analysis must be completed prior to June 30, 2020. A description of the Phase 1 PCP Legal Analysis, as stated in the MS4GP, reads as follows:

> *The permittee shall develop and implement an analysis that identifies existing regulatory mechanisms available to the MS4 such as bylaws and ordinances and describes any changes to regulatory mechanisms that may be necessary to effectively implement the entire PCP. This may include the creation or amendment of financial and regulatory authorities. The permittee shall adopt necessary regulatory changes by the end of the permit term.*

According to Appendix F, Section A.I.b., Phases 2 and 3 of the PCP will include an updated legal analysis as necessary, along with other efforts to complete structural and non-structural controls of phosphorus discharges from stormwater.

Tighe & Bond has prepared the Phase 1 PCP Legal Analysis to identify existing regulatory mechanisms available to the Town such as bylaws and regulations, any changes to regulatory mechanisms that may be necessary to effectively implement the entire PCP. The following includes a description of Bellingham's current legal authority to implement non-structural, structural and semi-structural phosphorus reduction actions on both public and private property and future changes that would be required to fully implement the PCP. The updated memorandum also considers the recently adopted Stormwater Utility, including potential benefits of the credit system for private properties, as well as the potential for EPA taking Residual Designation Authority (RDA) over private properties.

Legal Authority to Implement the PCP on Public Property

Current Authority

The Town of Bellingham has authority to undertake all structural and non-structural controls on public property. Public property consists of Town owned or operated parcels including parking

lots, as well as municipal roadways and the right of way. Bellingham can complete street sweeping, catch basin cleaning, and although not desired due to limited cost-effectiveness, an Organic Waste and Leaf Litter Collection program, both now and in the future. Bellingham has authority to install structural or semi-structural BMPs on Town-owned lands.

Changes Needed

There are no legal changes necessary to implement the PCP on public property. Requiring all new and redevelopment projects on public property to implement structural BMPs requires buy-in from municipal officials and planning for these efforts in capital and operational budgets.

Legal Authority to Implement the PCP on Private Property

Overview of Current Local Authority

In 2007, the Planning Board voted to accept revisions to their Regulations and Procedural Rules to add Erosion and Sedimentation Control requirements (see Section 7.7 and 7.8). The Zoning and Subdivision Bylaws reference the Planning Board Procedural Rules and thereby cover site development and redevelopment under the comprehensive Stormwater Management regulations and the Procedural Rules. Section 7.0 of the Procedural Rules includes construction and post-construction stormwater management requirements for new developments and redevelopments and aims to:

- Require practices to control the flow of stormwater from new and redeveloped sites into the Town storm drainage system in order to prevent flooding and erosion;
- Protect groundwater and surface water from degradation;
- Promote groundwater recharge;
- Prevent pollutants from entering Bellingham's MS4 and to minimize discharge of pollutants from the MS4;
- Ensure adequate long-term operation and maintenance of structural stormwater best management practices so that they work as designed;
- Comply with state and federal statutes and regulations relating to stormwater discharges; and
- Establish the town's legal authority to ensure compliance with the provisions of these regulations through inspection, monitoring, and enforcement.

If construction projects disturb one (1) or more acres, the Town requires the developer to submit an Erosion and Sediment Control Plan, Stormwater Management Plan, and Operation and Maintenance (O&M) Plan for approval. The Erosion and Sediment Control Plan includes the development of a Stormwater Pollution Prevention Plan if needed.

The Town ensures that proper erosion and sediment controls are maintained through their permitting process and site inspections during construction. The Town also inspects development and redevelopment projects for post-constructions stormwater control at the conclusion of the construction period. Developers are required to submit as-built plans of all structural stormwater controls and treatment best management practices at the site to the Town. The Town also requires that stormwater management easements are established to grant the Town sufficient access to all areas used for off-site stormwater control, and must be recorded on the property's deed.

Comments on Authority by Type of BMP

This analysis is organized by type of BMP under which phosphorus reduction credits can be obtained per the MS4 General Permit:

- Enhanced sweeping: Bellingham has no authority to physically sweep on private individual properties.
- Catch Basin Cleaning: Catch basin cleaning on private properties by a private entity can only be enforced under a local permit or Order of Conditions that requires catch basin cleaning through an O&M plan currently required through jurisdiction under the code descried above and/or Chapter 247 Wetlands Regulations of the Town Bylaws. This provision would typically be for new, deep sump catch basins installed in compliance with the Massachusetts Stormwater Handbook, not older or non-replaced basins on a project site.
- Organic Waste and Leaf Litter Collection program: Bellingham has no authority to require this work on private property; further, the Town has no control over the method of disposal on private individual properties. However, Bellingham's trash contractor does offer yard waste pickup of materials placed in paper biodegradable bags on Saturdays during the Spring and Fall.
- Structural BMPs[1]: Structural BMPs on private properties can be required through the local permitting process described above or through Chapter 247 Wetlands Regulations of the Town Bylaws.
- Semi-Structural BMPs[2]: There is limited opportunity to require semi-structural BMPs on private property through existing local controls.

Potential Incentive Created by Stormwater Utility Credit Policy

Bellingham began to consider enacting a stormwater utility in 2019 and completed initial evaluation of impervious area and potential fees described in the November 2019 memorandum titled "Bellingham Preliminary Impervious Area Calculations." As documented on the Town's website, the Selectboard placed an article on the November 13, 2019 Town Meeting Warrant to establish the Stormwater Management Enterprise Fund. After support by the Finance Committee, Town meeting voted to approve the Stormwater Enterprise Fund.

The initial Stormwater fee schedule was approved in early June 2020. The Stormwater utility budget was approved at the June 22, 2020 Town Meeting. The Stormwater Utility Fee Regulations and revised Stormwater Fee Schedule were accepted in late August 2020.

The Stormwater Utility Regulations provide a "credit" system that allows any private property owners that own, maintain, and operate on-site or off-site stormwater systems or facilities, or provides services or activities that reduce or mitigate the Town's cost of providing stormwater management services or assist the Town in achieving nutrient load reductions as required by the MS4 General permit to obtain a credit based on the technical and procedural criteria set forth in the Stormwater Utility Credit Policy. The credit policy, dated September 15, 2020, applies to large residential and non-residential properties and will be applied when the property

[1] Infiltration trench, Infiltration Basin or other surface infiltration practice, Bio-filtration Practice, Gravel Wetland System, Porous Pavement, Wet Pond or wet detention basin, Dry Pond or detention basin, Dry Water Quality Swale/Grass Swale

[2] Impervious Area Disconnection through Storage (e.g., rain barrels, cisterns, etc.), Impervious Area Disconnection, Conversion of Impervious Area to Permeable Pervious Area, and Soil Amendments to Enhance Permeability of Pervious Areas

owner successfully documents that the BMP they own and operate will achieve a phosphorus reduction. As of the date of this memorandum, the annual credit will amount to $500 per pound of phosphorus reduction per year and must be compared to the April 2005 Land Use baseline loading as certified by the professional engineering signing and stamping the application. Note that there is a maximum credit in fee reduction (80%) as well.

The intent of the credit system is to incentivize private properties to address phosphorus onsite to further help the Town of Bellingham achieve the total phosphorus reduction goals of the MS4 General Permit.

Consideration for RDA

The previous iteration of EPA's RDA permit called for individual Designated Discharges (DDs) located in Bellingham, Franklin, and Milford to reduce their total phosphorus loads by 65% from existing conditions. DDs include sites with two or more acres of impervious surface. At that time, there were 40 DDs in Bellingham (a total of 281.3 acres of impervious area in the Charles River watershed in Town).

This permit put the burden of a portion of the Town's total phosphorus reduction on specific properties and private development/redevelopment, which would have helped the Town achieve the total phosphorus load reduction but also would have had significant impacts on the local economy and businesses.

Bellingham must achieve a Phase 1 PCP Load Reduction of 161 lb/year within the Urbanized Area. Based on calculations presented in the June 30, 2018, letter report titled "Technical Review of EPA's Small Municipal Separate Storm Sewer Systems (MS4) General Permit Phosphorus Control Plan Obligations for the Town of Bellingham", the Town itself, with available municipal land (not including public roadways), may only be able to remove approximately 40 to 45 lbs/year with structural BMPs (about 27% of the Phase 1 PCP Reduction Requirement). **Given these ballpark calculations, the Town of Bellingham will not likely be able to achieve the total Phase 1 PCP Reduction without the help from private parcels or without significant roadway retrofits.**

The new iteration of RDA, in progress, has EPA in a Petition Review and Stakeholder Engagement Process to consider what makes logical sense to regulate in the watershed and how a permit will be structured.

While RDA is controversial and has ramifications for the Town's economy and local business presence, without RDA it is unlikely Bellingham will ever achieve the full phosphorus reduction required by the MS4 General Permit. In addition, politically, it will be very challenging if not impossible to locally require private properties to retrofit their site without some redevelopment that triggers local oversight without a new regulatory framework from EPA.

Changes Needed

To further implement the PCP on private property, the Town would need to undertake changes to local code. Some changes to consider include:

1. Potentially reducing the threshold by which a project would be reviewed through local code. Reducing this threshold would require a broader range of smaller-scale projects to comply with phosphorus reduction requirements.
2. Changes to roadway width, parking, and other requirements in zoning that result in creation of impervious cover. This will be evaluated by the end of permit year 4 as part of complying with Minimum Control Measure 5: Post-Construction Stormwater Management.

Appendix B
Funding Source Assessment

Tighe&Bond
Engineers | Environmental Specialists

B-0852-001
June 30, 2018

Mr. Donald DiMartino, DPW Director
Department of Public Works
26 Blackstone Street
Bellingham, MA 02019

Re: **Technical Review of EPA's Small Municipal Separate Storm Sewer Systems (MS4) General Permit Phosphorus Control Plan Obligations for the Town of Bellingham**

Dear Mr. DiMartino,

As you are aware, the Environmental Protection Agency's (EPA's) Small MS4 General Permit will require Bellingham to reduce phosphorus loadings to the Charles River and its tributaries by developing and implementing a Phosphorus Control Plan (PCP) that considers structural and non-structural practices to reduce the discharge of phosphorus in stormwater. EPA expects an iterative planning and implementation process, with interim phosphorus reduction milestones and a fully implemented PCP within 20 years of the permit effective date. As of the date of this letter, EPA is expecting the Small MS4 General Permit to become effective on July 1, 2018.

Tighe & Bond has prepared this letter report to provide Bellingham with a better understanding of the PCP requirements along with the effort and order of magnitude cost to complete the first phase of PCP planning and implementation, which is through Permit Year 10 (i.e., ending June 30, 2028). In our evaluation, we have considered phosphorus reduction progress since 2005 and calculated the remaining load reduction required by the end of Phase 1. We have also reviewed the September 2011 *Sustainable Stormwater Funding Evaluation for the Upper Charles Communities of Bellingham, Franklin, and Milford, MA* by Horsley Witten Group, Inc. and the August 2011 *Subwatershed Management Plan for Bellingham MA* by Charles River Watershed Association and Nitsch Engineering, Inc. and provided a third-party opinion to the Town regarding applicability of recommendations and costs given changes to State and Federal regulations.

Our goal with this letter report is to guide Bellingham with the big picture decisions to begin the PCP related to:

1. Implementing a PCP for the whole Town within the Charles River watershed or focusing the PCP on the MS4 (Urbanized) area in the watershed;
2. Quantifying the phosphorus reduction progress since 2005; and
3. Determining what recommendations from previous studies are actually cost-effective and may warrant inclusion in the PCP.

While this letter report is not the PCP, it will provide Bellingham with key information that should be further examined, expanded upon, and ultimately incorporated into the PCP as the Town continues to address EPA's requirements.

1. Overview of Small MS4 Permit Requirements for Phosphorus Control

On April 4, 2016, EPA Region 1 released a final Small MS4 General Permit for Massachusetts that has an anticipated effective date of July 1, 2018. This permit includes requirements to reduce pollutants of concern for impaired waterbodies, such as the Charles River.

A finalized Total Maximum Daily Load (TMDL) to reduce nutrients[1] in the Charles River watershed was approved by EPA on June 10, 2011. Phosphorus is a nutrient that, when present at high levels in natural waterbodies, can cause overgrowth of aquatic plants, increased harmful algal blooms, decreased light in a waterbody, and decreased levels of dissolved oxygen. Phosphorus is a common pollutant in stormwater, with sources including leaf litter, pet waste, road salt, fertilizer, and atmospheric deposition. A variety of structural and non-structural Best Management Practices (BMPs) can be effective at reducing phosphorus loads from stormwater.

To reduce the phosphorus load to the River consistent with the established TMDL, MS4 permittees within the Charles River watershed must develop and implement a PCP as part of their Stormwater Management Program. The permit has a five-year term; however, the PCP includes obligations that extend for two decades. Appendix F of the Small MS4 General Permit presents the requirements. We have summarized them in the following paragraphs.

The following figure shows the phases of the PCP. In general, EPA expects communities to take an adaptive management approach that calls for an iterative planning, implementation, and evaluation process and allows for an opportunity to adjust the PCP in the next iteration of planning. This approach benefits affected communities as it allows for changes to be made during planning and implementation to address things that are not working or are no longer feasible.

1-5 years after permit effective date	5-10 years after permit effective date	10-15 years after permit effective date	15-20 years after permit effective date
Create Phase 1 Plan	Implement Phase 1 Plan		
	Create Phase 2 Plan	Implement Phase 2 Plan	
		Create Phase 3 Plan	Implement Phase 3 Plan

FIGURE 1: PCP Timeline from Appendix F of the 2016 Small MS4 Permit

Permittees are required to fully implement the PCP no later than 20 years after the effective date of the permit (i.e., July 1, 2038). EPA has set intermediate deadlines for compliance as part of each phase of the PCP. Table 1 shows components of creating and implementing the Phase 1 PCP and associated deadlines.

[1] *Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River,* available online at: http://www.mass.gov/eea/docs/dep/water/resources/n-thru-y/ucharles.pdf

TABLE 1
PCP Phase 1 Deadlines

Item Number	Phase 1 of the PCP Component and Milestones	Completion Date
1-1	Legal Analysis	July 1, 2020
1-2	Funding Source Assessment	July 1, 2021
1-3	Define Scope of PCP (PCP Area) Baseline Phosphorus Load and Phosphorus Reduction Requirement and Allowable Phosphorus Load	July 1, 2022
1-4	Description of Phase 1 planned non-structural controls	July 1, 2023
1-5	Description of Phase 1 planned structural controls	July 1, 2023
1-6	Description of Operation and Maintenance program for structural controls	July 1, 2023
1-7	Phase 1 implementation schedule	July 1, 2023
1-8	Estimated cost for implementing Phase 1 of the PCP	July 1, 2023
1-9	Complete Written Phase 1 PCP	July 1, 2023
1-10	Full implementation of nonstructural controls	July 1, 2024
1-11	Performance Evaluation	July 1, 2024 & July 1, 2025
1-12	1. Performance Evaluation 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load plus the applicable Phosphorus Reduction Requirement multiplied by 0.8 (i.e., 20% reduction)	July 1, 2026
1-13	Performance Evaluation	July 1, 2027
1-14	1. Performance Evaluation 2. Full implementation of all structural controls used to demonstrate that the total phosphorus export rate from the PCP Area in mass/yr is equal to or less than the applicable Allowable Phosphorus Load plus the applicable Phosphorus Reduction Requirement multiplied by 0.75 (i.e., 25% reduction)	July 1, 2028

Bellingham will be required to include progress reports on the planning and implementation of their PCP in Annual Reports to EPA and the Massachusetts Department of Environmental Protection (MassDEP), starting with the first report. Beginning five years after the effective permit date (i.e., July 1, 2023), permittees are required to submit additional information with their Annual Report related to the PCP, including the following:

- All non-structural control measures implemented during the reporting year with the phosphorus reduction in mass per year calculated consistently with the procedures in Attachment 2 to Appendix F of the permit.
- Structural controls implemented during the reporting year and all previous years including:

  - Location information (GPS coordinates or street address);
  - Phosphorus reduction from all structural BMPs implemented as part of the PCP to date in mass/year, calculated consistently with the procedures in Attachment 3 to Appendix F of the permit; and
  - Date of last completed maintenance and inspection for each structural control.
- Phosphorus load increases due to development over the previous reporting period and incurred since 2005 calculated consistently with the procedures in Attachment 1 to Appendix F of the permit.
- Estimated yearly phosphorus export rate from the PCP Area.
- Certification that all structural BMPs are being inspected and maintained according to the O&M program specified as part of the PCP.
- Certification that all municipally owned and maintained turf grass areas are being managed in accordance with Massachusetts Regulation 331 CMR 31 pertaining to the proper use of fertilizers on turf grasses.

2. Phosphorus Reduction from EPA-Prescribed BMPs

The Small MS4 General Permit is prescriptive in what BMPs can be used to get "credit" for phosphorus removal.

Non-structural BMPs

Non-structural controls defined by the 2016 permit include the following:

- Enhanced Street Sweeping Program (credits depend on type of sweeper and frequency of sweeping)
- Catch Basin Cleaning
- Organic Waste and Leaf Litter Collection Program

In addition, the permit describes calculations for determining the load reduction of phosphorus from the implementation of the following non-structural/semi-structural BMPs:

- Impervious Area Disconnection through Storage (rain barrels, cisterns, etc.)
- Impervious Area Disconnection
- Conversions of Impervious Area to Permeable Pervious Area
- Soil Amendments to Enhance Permeability of Pervious Areas

Structural BMPs

The 2016 permit provides methods to determine phosphorus load reductions from the following structural BMPs:

- Infiltration Trench
- Infiltration Basin or other surface infiltration practice
- Biofiltration Practice
- Gravel Wetland System
- Porous Pavement
- Wet Pond or Wet Detention Basin

- Dry Pond or Detention Basin
- Dry Water Quality Swale/Grass Swale

It is assumed that the Town will be able to report phosphorus removal credit for structural BMPs that either fall into one of the categories listed above, or have the same functionality as those listed above, per guidance in Attachment 3 of Appendix F of the Permit.

In Attachment 3 to Appendix F, EPA provides specific calculations for each structural BMP to determine total phosphorus load reduction "credit" that are based on contributing drainage area cover, depth of runoff treated, storage volume, soils type, etc. EPA has also released a stormwater management optimization tool ("Opti-tool"), which is a spreadsheet-based model designed to conduct both watershed-wide planning level analyses as well as detailed site-specific analyses for estimating regional long-term cumulative pollutant load and runoff volume reduction performances for 11 categories of structural BMPs. Output also allows users to evaluate the cost and benefit of various BMPs. According to discussions with EPA and trainings attended by Tighe & Bond staff, the calculations presented in the Opti-tool are consistent with the Small MS4 General Permit.

3. Bellingham's Phosphorus Reduction Goals

EPA has calculated a baseline phosphorus load and phosphorus reduction goals for each municipality in the Charles River watershed using information provided in the TMDL and more recent land use information available through MassGIS. As required by the PCP, communities must define the scope of the PCP (PCP Area) and associated Baseline Phosphorus Load, Phosphorus Reduction Requirement, and Allowable Phosphorus Load. EPA provides communities with two options for the PCP Area. To reduce the discharge of phosphorus, they can implement non-structural and structural BMPs within either:

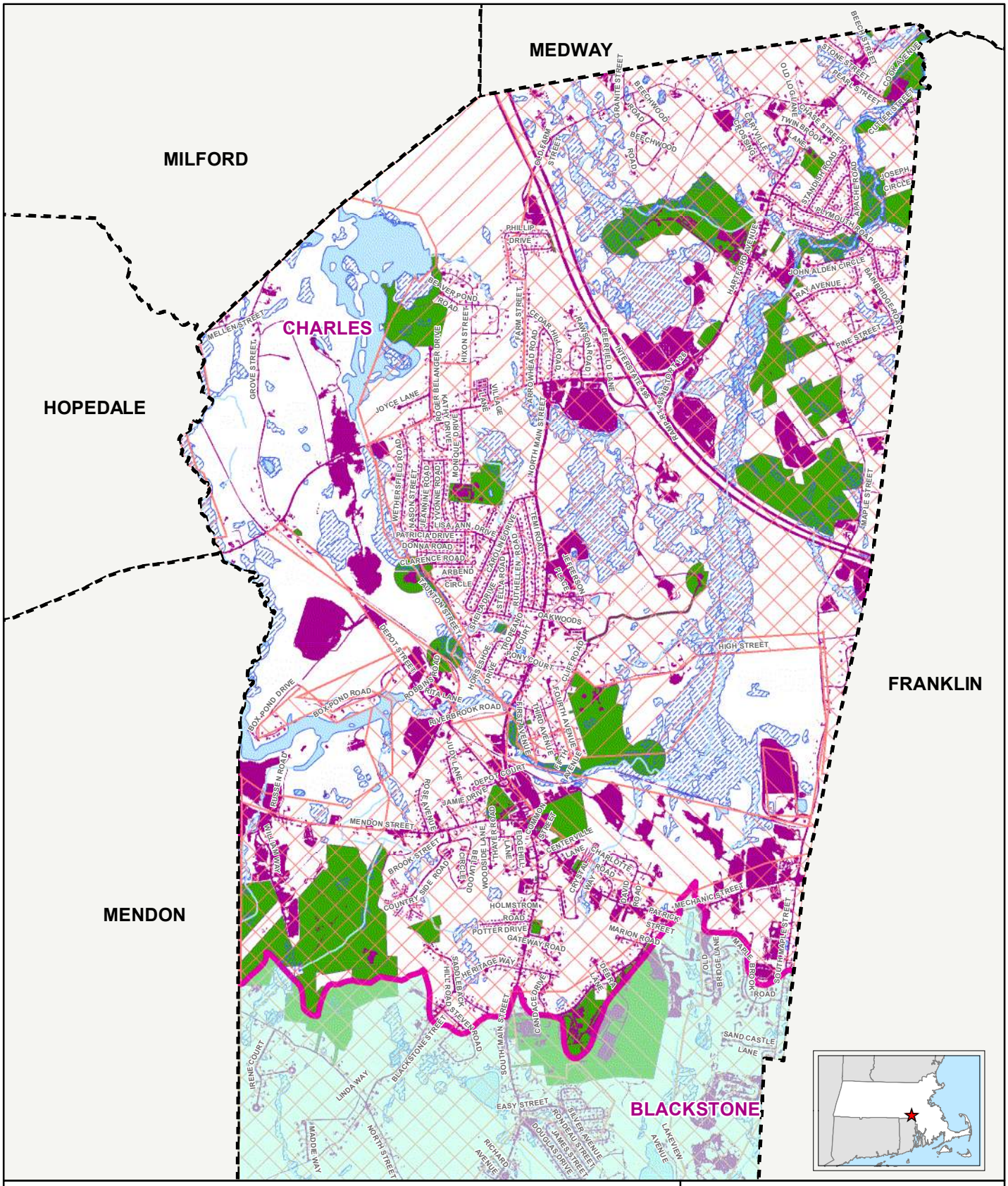
1. The entire area of Town within the Charles River watershed; or
2. Only in the Urbanized Area within the Charles River watershed.

Figure 2 shows the portion of Bellingham within the Charles River watershed and the portion of Town that is considered Urbanized Area, along with impervious area and Town-owned parcels. Table 2 lists the current load estimate and reduction goal for both the whole community and for only the urbanized area.

TABLE 2

Annual Phosphorus Load Reduction Requirements for Bellingham

Charles River Watershed Area in:	Baseline Phosphorus Load in lb/year (kg/yr)	Stormwater Phosphorus Load Reduction Requirement in lb/year (kg/yr)	Allowable Phosphorus Load in lb/year (kg/yr)	Stormwater Percent Reduction in Phosphorus Load (%)
Bellingham	2,088 (947)	730 (331)	1,358 (616)	35%
Urbanized Area of Bellingham	1,766 (801)	642 (291)	1,124 (510)	36%
	Difference:	88 (40)		



Legend

- Town-owned Parcels
- Charles River Watershed
- Blackstone River Watershed
- Impervious Area
- MS4 Regulated Area (2000 Census)
- MS4 Regulated Area (2010 Census)
- Town Boundary
- Stream/Intermittent Stream
- Inland Wetlands
- Coastal Wetlands
- Public Surface Water Supply
- Lake, Pond, River or Impoundment

1 inch equals 3,000 feet

0 1,500 3,000

Feet

Tighe&Bond
Engineers | Environmental Specialists

Based on MassGIS Color Orthophotography (2013)

FIGURE 2
CHARLES RIVER WATERSHED

Phosphorus Control Plan
Bellingham, Massachusetts

May 2018

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M-1755

The permit contains a schedule of interim removal goals of the total phosphorus reduction with the different phases of the PCP. Removal percentages of the total reduction and the corresponding pounds of phosphorus to be removed by the interim deadlines are included in Table 3.

TABLE 3

Phosphorus Load Reduction within the Charles River Watershed

Permit Year	Percent Reduction	Load to be Reduced in Total Town Area (lbs/year)	Load to be Reduce in Urbanized Area (lbs/year)	Difference (lbs/year)
Year 8	20%	146	128	18
Year 10	25%	183	161	22
Year 13	35%	256	225	31
Year 15	50%	365	321	44
Year 18	70%	511	449	62
Year 20	100%	730	642	88

A decision must be made whether the Town should implement the PCP in the entire area of Town within the Charles River watershed or only within the Urbanized Area of the Town area within the Charles River Watershed.

To make this decision, we considered the following factors:

- The relative difference in load reduction between the two options. Deciding to reduce the phosphorus load town-wide in the watershed instead of only in the Urbanized Area requires 14% more total phosphorus to be addressed through structural or non-structural BMPs. The difference is 22 lbs/year in implementation of Phase 1 of the PCP and 88 lbs/year by the end of the final phase of the PCP. This difference cannot be addressed with non-structural BMPs alone and therefore would require between 5 and 15 structural BMPs to be installed to account for the remaining load reduction, which increases cost of completing the PCP. Costs to construct BMPs are discussed in Section 4 of this report.
- Impervious area. Impervious cover is denser and more extensive within the Urbanized area (16% of the Urbanized area is impervious), while impervious cover outside the Urbanized Area is less dense and covers less of the area (only 9.5% of the remainder of the watershed is impervious). EPA calculations estimate higher loads of total phosphorus come from impervious area than pervious area, and therefore it is more cost-effective to install retrofits that treat impervious area. With less impervious cover outside of the Urbanized Area, there are fewer opportunities for siting larger, structural BMPs that provide cost-effective load reduction.
- Available municipal land for retrofit installation. There are 61 town-owned parcels within the entire watershed and all but two are within the urbanized area. Municipally-owned parcels and the road right-of-way are the first places to consider structural BMP installation as they are within the Town's control for construction and long-term operation and maintenance. There is 37 acres of impervious area on Town-owned parcels in the Urbanized area and only 1.49 acres of impervious cover on Town parcels outside of the Urbanized area, further indicating there are more opportunities within the Urbanized Area to install retrofits on Town-owned parcels

Based on these considerations, we recommend Bellingham undertake the PCP within the Urbanized Area only. According to Table 3, this translates to phosphorous load reduction goals of 161 lbs/year (25% of target) and 642 lbs/year (100% of target) by the end of Permit Years 10 and 20, respectively. However, if there were a new, compelling reason to extend the PCP to the entire watershed (e.g., substantial private development or US Census dramatically expands the Urbanized Area in the future), the PCP scope could be updated in a later phase of planning. In addition, we recommend that non-structural controls (e.g., sweeping, catch basin cleaning) continue to be completed within the entire watershed and new development and redevelopment within the entire watershed area should meet TMDL goals for phosphorus reduction.

4. Quantifying Phosphorus Load Increases and Reduction Since 2005

By July 1, 2023, EPA requires permittees to submit additional information with their annual report related to the PCP, including, *phosphorus load decreased and increases incurred since 2005 calculated consistently with the procedures in Attachment 1 to Appendix F of the permit.*

Tighe & Bond worked with Town staff to begin to quantify the phosphorus load changes since 2005. Our initial intent was to help the Town take credit for stormwater improvements and to estimate the phosphorous load reduction achieved by installation of municipal and private stormwater BMPs. However, the Town must also consider the net impact of new development and redevelopment projects on phosphorous load. Tighe & Bond compiled information made available by Town staff and Town records, along with work completed by other entities that is publicly available, to identify development and redevelopment projects and understand the types and locations of structural BMPs and the associated impact on total phosphorus load. Using the Assessor's database, we identified 61 parcels throughout Charles River watershed where the year built was 2005 or after, as shown in Figure 3 and Table 4.

- The majority of these parcels are residential single-family homes and therefore do not likely have any stormwater BMPs. These parcels are **shaded grey** on Table 4.
- One large site, the Dunkin Donuts New England Distribution Center warehouse at 150 Depot Street, is not within the Urbanized Area. The industrial site at 140 Depot Street is approximately 50% within the Urbanized Area. There were two condo projects at Old Bridge Lane and Maplebrook Road that are within the Urbanized Area but only a small portion of the entire parcel is within the Charles River watershed. It may be worth reviewing these larger sites to confirm location of stormwater discharges and whether structural BMPs were installed within the watershed. These sites are noted on Figure 3 and **shaded orange** on Table 4.
- There are a few commercial/industrial parcels that have been developed since 2005, and therefore may have stormwater BMPs onsite. These parcels are **shaded yellow** in Table 4.

MEDWAY

MILFORD

HOPEDALE

MENDON

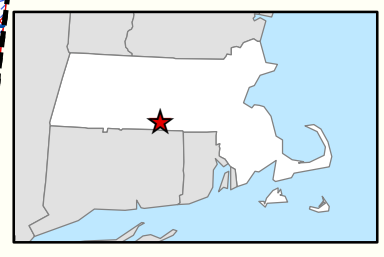
FRANKLIN

BLACKSTONE

CHARLES

STONE STREET
COOK AVENUE
FARM STREET
CHASE STREET
PEARL STREET
STANDISH ROAD
APACHE ROAD
PLYMOUTH ROAD
HARTFORD AVENUE
JOHN ALDEN CIRCLE
RAY AVENUE
BAINBRIDGE ROAD
BRITTANY ROAD
MAPLE STREET
INTERSTATE 495
VALLEY VIEW ROAD
PHILLIP DRIVE
MELLEN STREET
HIXON STREET
ARROWHEAD ROAD
CEDAR HILL ROAD
DEERFIELD LANE
JOYCE LANE
GROVE STREET
NASON STREET
KATHY DRIVE
MONIQUE DRIVE
NORTH MAIN STREET
WETHERSFIELD ROAD
JEANNINE ROAD
YVONNE ROAD
SHIRLEY ROAD
TEMI ROAD
PATRICIA DRIVE
DONNA ROAD
CLARENCE ROAD
CAROLINE DRIVE
ANNMARIE DRIVE
SHEILA DRIVE
TAUNTON STREET
DEPOT STREET
BOX POND DRIVE
PONY COURT
HIGH STREET
FIFTH AVENUE
THIRD AVENUE
JUDY LANE
RUSSEN ROAD
ROSE AVENUE
TONI DRIVE
THAYER ROAD
WOODSIDE LANE
EDGEHILL LANE
MILL STREET
MENDON STREET
COUNTRY SIDE ROAD
DAVID ROAD
CRYSTAL WAY
POTTER DRIVE
MECHANIC STREET
OLD BRIDGE LANE
HERITAGE WAY
NORTH STREET
LYNN COURT
LINDA WAY
STEVEN ROAD
SAND CASTLE LANE
EASY STREET
BRION ROAD

2-1 2-2 2-3 2-4
4-1 4-2 4-3
5-1 5-2
11-1
12-1 12-2
13-1 13-2
15-1 15-2
16-1
17-2 17-3



LEGEND

- Building Constructed Since 2005
- Water Quality Structure (BMPs)
- Stream, Brook

Roads
CLASS

- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road

- Town Boundary
- Urban Area (2000)
- Urban Area (2010)
- Major Drainage Basin
- Lake, Pond, River or Impoundment
- Inland Wetlands
- Town-owned Parcels

1:21,000

0 875 1,750

Feet

N

Tighe&Bond

Engineers | Environmental Specialists

Figure 3
Charles River Watershed
Property Assessment

Bellingham, Massachusetts

May 2018

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F-0094

TABLE 4

Parcels Developed Since 2005 in Bellingham

MAP_PAR_ID	BLDG_VAL	LAND_VAL	OTHER_VAL	TOTAL_VAL	LOT_SIZE	USE_CODE	SITE_ADDR	LOCATION	ZONING	YEAR_BUILT	BLD_AREA	UNITS	RES_AREA	STYLE
0052-0005-0000	$ 920,000	$ 386,400	$ 42,200	$ 1,348,600	0.8	341	2 SOUTH MAPLE ST		BUS1	2008	6882	4	6882	BANK
0029-0136-0000	$ 224,800	$ 113,600	$ 13,400	$ 351,800	0.47	101	250 SHIRLEY RD		RES	2010	2648	1	2648	CAPE
0035-0003-0000	$ 192,300	$ 97,900	$ -	$ 290,200	0.61	101	114 NORTH MAIN ST		RES	2011	2214	1	2214	CAPE
0043-0025-0000	$ 252,700	$ 117,600	$ -	$ 370,300	0.24	101	69 BOX POND DR		AGR	2009	2782	1	2782	CAPE
0004-0047-0001	$ 171,600	$ 114,100	$ -	$ 285,700	2.44	101	489 HARTFORD AV		RES	2010	1344	1	1344	CAPE
0018-028+-0001	$ 120,900	$ 136,400	$ -	$ 257,300	1.17	130	3 SHARPE DR		RES	2012	1899	1	1899	CAPE
0009-0029-0000	$ 206,300	$ 102,100	$ -	$ 308,400	1.04	101	401 HARTFORD AV		SUBN	2005	2094	1	2094	COLONIAL
0009-0029-0001	$ 331,300	$ 119,000	$ -	$ 450,300	3.01	101	403 HARTFORD AV		SUBN	2006	2634	1	2634	COLONIAL
0051-0009-0003	$ 300,500	$ 147,700	$ -	$ 448,200	1.34	101	17 ROLLING HILLS DR		SUBN	2005	4320	1	4320	COLONIAL
0051-0009-0001	$ 308,100	$ 144,500	$ 1,100	$ 453,700	0.95	101	9 ROLLING HILLS DR		SUBN	2005	3997	1	3997	COLONIAL
0051-0009-0002	$ 334,000	$ 157,500	$ 1,700	$ 493,200	2.49	101	13 ROLLING HILLS DR		SUBN	2005	4470	1	4470	COLONIAL
0004-0027-0000	$ 231,300	$ 112,500	$ -	$ 343,800	0.28	101	7 STONE ST		RES	2009	2537	1	2537	COLONIAL
0018-0089-0000	$ 206,700	$ 90,800	$ -	$ 297,500	0.45	101	30 DEERFIELD LN		RES	2005	2234	1	2234	COLONIAL
0023-0075-0000	$ 204,900	$ 96,600	$ 1,400	$ 302,900	0.49	101	87 HARTFORD AV		RES	2007	2473	1	2473	COLONIAL
0018-028+-0000	$ 202,500	$ 135,100	$ -	$ 337,600	1.02	101	1 SHARPE DR		RES	2012	1650	1	1650	COLONIAL
0052-005A-0001	$ 251,800	$ 92,100	$ -	$ 343,900	1.06	101	8 SOUTH MAPLE ST			2011	2164	1	2164	COLONIAL
0018-0101-0001	$ 244,800	$ 134,500	$ -	$ 379,300	0.94	101	8 SHARPE DR		RES	2012	1982	1	1982	COLONIAL
0023-0010-0001	$ 238,500	$ 110,600	$ -	$ 349,100	2.03	101	149 HARTFORD AV		RES	2009	3175	1	3175	COLONIAL
0004-046A-0000	$ 204,300	$ -	$ -	$ 204,300	0	102	12 B PEARL ST	B	RES	2008	1250	1	1250	CONDEX
0004-046A-0001	$ 204,300	$ -	$ -	$ 204,300	0	102	12 A PEARL ST	A	RES	2008	1250	1	1250	CONDEX
0051-0001-0001	$ 268,100	$ -	$ -	$ 268,100	0	102	801 OLD BRIDGE LN		AGR	2005	2257	1	2257	CONDO-TNHS
0051-0001-0001	$ 266,300	$ -	$ -	$ 266,300	0	102	802 OLD BRIDGE LN		AGR	2005	2050	1	2050	CONDO-TNHS
0051-0001-0001	$ 264,300	$ -	$ -	$ 264,300	0	102	803 OLD BRIDGE LN		AGR	2005	2050	1	2050	CONDO-TNHS
0051-0001-0001	$ 271,700	$ -	$ -	$ 271,700	0	102	804 OLD BRIDGE LN		AGR	2005	2257	1	2257	CONDO-TNHS
0051-0001-0001	$ 264,300	$ -	$ -	$ 264,300	0	102	901 OLD BRIDGE LN		AGR	2005	2050	1	2050	CONDO-TNHS
0051-0001-0001	$ 281,600	$ -	$ -	$ 281,600	0	102	902 OLD BRIDGE LN		AGR	2005	2711	1	2711	CONDO-TNHS
0051-0001-0001	$ 264,300	$ -	$ -	$ 264,300	0	102	903 OLD BRIDGE LN		AGR	2005	2050	1	2050	CONDO-TNHS
0051-0001-0001	$ 270,400	$ -	$ -	$ 270,400	0	102	904 OLD BRIDGE LN		AGR	2005	2380	1	2380	CONDO-TNHS
0051-0001-0001	$ 246,600	$ -	$ -	$ 246,600	0	102	1001 OLD BRIDGE LN		AGR	2005	1846	1	1846	CONDO-TNHS
0051-0001-0001	$ 247,400	$ -	$ -	$ 247,400	0	102	1002 OLD BRIDGE LN		AGR	2005	1846	1	1846	CONDO-TNHS
0051-0001-0001	$ 247,400	$ -	$ -	$ 247,400	0	102	1003 OLD BRIDGE LN		AGR	2005	1846	1	1846	CONDO-TNHS
0051-0001-0001	$ 247,400	$ -	$ -	$ 247,400	0	102	1004 OLD BRIDGE LN		AGR	2005	1846	1	1846	CONDO-TNHS
0051-0001-0001	$ 263,100	$ -	$ -	$ 263,100	0	102	2901 MAPLE BROOK RD	A	AGR	2007	2039	1	2039	CONDO-TNHS
0051-0001-0001	$ 263,100	$ -	$ -	$ 263,100	0	102	2902 MAPLE BROOK RD	B	AGR	2007	2039	1	2039	CONDO-TNHS
0051-0001-0001	$ 263,100	$ -	$ -	$ 263,100	0	102	2903 MAPLE BROOK RD	C	AGR	2007	2039	1	2039	CONDO-TNHS
0051-0001-0001	$ 265,300	$ -	$ -	$ 265,300	0	102	2904 MAPLE BROOK RD	D	AGR	2007	2039	1	2039	CONDO-TNHS
0051-0001-0001	$ 256,500	$ -	$ -	$ 256,500	0	102	3001 MAPLE BROOK RD	A	AGR	2005	2046	1	2046	CONDO-TNHS
0051-0001-0001	$ 263,500	$ -	$ -	$ 263,500	0	102	3002 MAPLE BROOK RD	B	AGR	2005	2047	1	2047	CONDO-TNHS
0051-0001-0001	$ 260,700	$ -	$ -	$ 260,700	0	102	3003 MAPLE BROOK RD	C	AGR	2005	2045	2	2045	CONDO-TNHS
0051-0001-0001	$ 260,400	$ -	$ -	$ 260,400	0	102	3004 MAPLE BROOK RD	D	AGR	2005	2039	1	2039	CONDO-TNHS
0051-0001-0001	$ 270,700	$ -	$ -	$ 270,700	0	102	3101 MAPLE BROOK RD	A	AGR	2005	2461	1	2461	CONDO-TNHS
0051-0001-0001	$ 265,100	$ -	$ -	$ 265,100	0	102	3102 MAPLE BROOK RD	B	AGR	2005	2049	1	2049	CONDO-TNHS
0051-0001-0001	$ 261,200	$ -	$ -	$ 261,200	0	102	3103 MAPLE BROOK RD	C	AGR	2005	2053	1	2053	CONDO-TNHS
0051-0001-0001	$ 263,400	$ -	$ -	$ 263,400	0	102	3104 MAPLE BROOK RD	D	AGR	2005	2053	1	2053	CONDO-TNHS

TABLE 4

Parcels Developed Since 2005 in Bellingham

MAP_PAR_ID	BLDG_VAL	LAND_VAL	OTHER_VAL	TOTAL_VAL	LOT_SIZE	USE_CODE	SITE_ADDR	LOCATION	ZONING	YEAR_BUILT	BLD_AREA	UNITS	RES_AREA	STYLE
0051-0001-0001	$ 259,100	$ -	$ -	$ 259,100	0	102	3601 MAPLE BROOK RD	A	AGR	2007	1990	1	1990	CONDO-TNHS
0051-0001-0001	$ 266,000	$ -	$ -	$ 266,000	0	102	3602 MAPLE BROOK RD	B	AGR	2007	2008	1	2008	CONDO-TNHS
0051-0001-0001	$ 266,000	$ -	$ -	$ 266,000	0	102	3603 MAPLE BROOK RD	C	AGR	2007	2008	1	2008	CONDO-TNHS
0051-0001-0001	$ 259,100	$ -	$ -	$ 259,100	0	102	3701 MAPLE BROOK RD	A	AGR	2007	1990	1	1990	CONDO-TNHS
0051-0001-0001	$ 266,200	$ -	$ -	$ 266,200	0	102	3702 MAPLE BROOK RD	B	AGR	2007	2008	1	2008	CONDO-TNHS
0051-0001-0001	$ 266,000	$ -	$ -	$ 266,000	0	102	3703 MAPLE BROOK RD	C	AGR	2007	2008	1	2008	CONDO-TNHS
0019-001B-0000	$ 609,200	$ 482,500	$ 265,400	$ 1,357,100	7.87	333	300 HARTFORD AV		IND	2008	4000	1	4000	CONVEN MKT
0052-0001-0000	$ 965,900	$ 539,100	$ 352,700	$ 1,857,700	2.44	333	207 MECHANIC ST		IND	2007	7680	4	7680	CONVEN MKT
0013-0010-2A-2	$ 210,700	$ 149,400	$ -	$ 360,100	3.65	101	36 BEECHWOOD RD		AGR	2008	1848	1	1848	RANCH
0035-0076-0000	$ 278,600	$ 102,100	$ 13,600	$ 394,300	1.04	101	139 NORTH MAIN ST		SUBN	2006	3068	1	3068	RANCH
0044-0082-0000	$ 475,700	$ 288,000	$ 36,700	$ 800,400	2.1	332	46 NORTH MAIN ST		BUS1	2007	10760	1	10760	REPAIR GAR
0052-005A-0000	$ 570,400	$ 265,500	$ 34,100	$ 870,000	1.63	351	6 SOUTH MAPLE ST		BUS1	2006	8072	1	8072	SCH/DAYCAR
0051-001A-0001	$ 2,527,900	$ 387,800	$ 198,500	$ 3,114,200	4.18	323	191 MECHANIC ST		IND	2008	29000	12	29000	SHOP CTR
0045-0050-0001	$ 1,755,100	$ 511,100	$ 74,500	$ 2,340,700	1.94	322	20 MECHANIC ST			2006	14730	1	14730	STORE
0038-0023-0001	$ 16,307,900	$ 2,165,700	$ 237,200	$ 18,710,800	35.01	401	150 DEPOT ST		IND	2005	231817	1	231817	WAREHOUSE
0051-0016-0000	$ 11,078,500	$ 1,604,100	$ 241,100	$ 12,923,700	18.96	401	190 MECHANIC ST		IND	2005	208826	3	208826	WAREHOUSE
0038-0023-0002	$ 12,353,300	$ 2,130,600	$ 371,000	$ 14,854,900	33.82	401	140 DEPOT ST		IND	2008	238975	1	238975	WAREHOUSE

Discussions with Town staff indicated that gathering the building permits, Conservation Commission Order of Conditions, site plan review documents, and other local permit applications and decisions would be a significant effort given the Town's current staffing level, work level, and filing system. Staff also clarified that there had not been a reduction of impervious surface or significant construction of stormwater BMPs on these sites. Although there are 15 stormwater BMPs under the control of the Town that have been constructed within the watershed since 2005, these BMPs are not likely sufficient to offset the increased phosphorus loading from the increased imperviousness in the watershed. These BMPs do not likely manage the total increased impervious area and, based on the inventory included in GIS, these BMPs are all detention basins or plunge pools, which have a low credit for total phosphorus removal compared to infiltration type BMPs.

Therefore, based on our discussions with Town staff and review of mapping, we have assumed that the total phosphorus load in Bellingham within the Charles River watershed has likely *increased,* not decreased, since 2005. **As of the date of this letter report we are assuming that Bellingham must, at a minimum, reduce the total phosphorus load cited in EPA's permit.** Assuming the load is reduced only within the Urbanized Area as discussed in Section 3, Bellingham must remove 161 lbs/year of total phosphorus by Permit Year 10 (2028) through structural and non-structural controls.

The Town will be required to estimate of total phosphorus load change due to development and redevelopment closer to the Small MS4 General Permit deadline in 2023 using GIS data related to land use and impervious cover from the Commonwealth of Massachusetts and the Town. We recommend the Town continue to gather records for projects within the Charles River watershed to track changes in land use and impervious cover as well as identify structural BMP types and locations and to quantify the total phosphorus load reduction achieved by these BMPs using EPA's required calculations. This effort will be coupled with the EPA's mapping requirements for Bellingham to locate public and private structural stormwater BMPs.

5. Recommendations to Achieve PCP Phase 1 Reduction Goal

2011 Sustainable Stormwater Funding Evaluation

EPA Region 1 commissioned a study completed by Horsley Witten that resulted in the 2011 report titled *Sustainable Stormwater Funding Evaluation for the Upper Charles River Communities of Bellingham, Franklin, and Milford, MA* ("2011 Funding Evaluation"). This study evaluated the costs associated with meeting the phosphorus reductions established in the TMDL for the Upper Charles River, as well as meeting requirements of the 2010 draft Small MS4 permit and the draft Residual Designation Authority permit for Bellingham, Franklin, and Milford. This report presents the results of the study including implementation alternatives, cost estimates for operations and structural BMPs, governance and administration options, funding options, billing options, and recommendations for next steps

Since the publication of the 2011 Funding Evaluation, there have been two important changes that impact the findings presented in this report:

1. A final 2016 Small MS4 permit was issued with new phosphorus reduction requirements. At the time the 2011 Funding Evaluation was written, EPA's 2010 draft Small MS4 permit had a target phosphorus load reduction of 51.8% for Bellingham. The 2016 final Small MS4 permit includes a phosphorus load reduction goal of around 35% for Bellingham. The Commonwealth of Massachusetts has since restricted the use of fertilizers containing phosphorus on all non-agricultural turf and lawns (330 CMR

31.00). The reduced phosphorus removal target in the 2016 permit reflects a credit for this state-wide ban in phosphorus fertilizers.

2. The Residual Designation Authority permit (RDA permit) is currently on hold without an expected release date. The RDA permit called for individual Designated Discharges (DDs) located in Bellingham, Franklin and Milford to reduce their total phosphorus loads by 65% from existing conditions. DDs include sites with two or more acres of impervious surface. There are 40 DDs in Bellingham. This permit put the burden of a portion of the Town's total phosphorus reduction on specific existing properties and private development/redevelopment, which would have helped the Town achieve the total phosphorus load reduction but also would have had significant impacts on the local economy and businesses.

Current Stormwater Program Costs

Section 4 of the 2011 Funding Evaluation presents cost estimates for existing stormwater services to address the 2003 Small MS4 General Permit, as well as the projected cost of future services to address the 2010 draft Small MS4 and RDA general permit. Costs for the existing program included expenditures related to the administration and implementation of the 2003 stormwater program. Future costs assume adding new services to the existing program as necessary to fulfill conditions of the draft 2010 Small MS4 General Permit and to meet phosphorus load reductions. Future services are divided into operational costs (running the program) and capital expenditures (retrofitting with structural practices for phosphorus reductions).

The 2011 Funding Evaluation's presentation of existing operational costs for administration, regulation/enforcement, engineering & master planning, operation & maintenance, and monitoring was comprehensive. The report assumed Bellingham was spending approximately $235,000 (2010$) annually to address the 2003 permit.

Future Stormwater Program Costs

Future stormwater costs built on the 2010 existing costs to include new services required by the draft Small MS4 permit and the optional provisions for municipal involvement in RDA general permit. **The 2011 Funding Evaluation estimated the annual operational cost estimates for Bellingham's municipal stormwater program would range from $799,000 to $1,029,000 annually.** These costs represented a significant increase over the estimated current annual stormwater expenditures. Figure 4, below, shows the Operational Costs for Bellingham's program as presented in the 2011 Funding Evaluation.

Cost Center	Existing	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10
Administration	$18,421	$69,373	$48,185	$34,343	$56,558	$54,785	$61,984
Regulation/ Enforcement	$1,800	$3,750	$13,500	$13,500	$13,500	$24,375	$27,578
Engineering & Master Planning	$17,000	$311,007	$419,892	$259,470	$179,245	$171,275	$193,782
Operations & Implementation	$194,918	$470,028	$469,028	$493,313	$471,528	$550,736	$623,107
Monitoring	$0	$17,650	$77,975	$77,975	$77,975	$77,975	$88,222
Total	**$232,139**	**$871,807**	**$1,028,579**	**$878,601**	**$798,806**	**$879,145**	**$994,672**

FIGURE 4: Operational Costs for Bellingham's Stormwater Program from 2011 Funding Evaluation

Future programmatic costs appear to overestimate the total obligation for compliance based on the 2016 Small MS4 General Permit for the following reasons:

- Based on review of Table 4.9, Cost Assumptions and Implementation Timeframe for New and Enhanced Services, Horsley Witten assumed a level of service that is

significantly beyond minimum compliance with requirements of the Small MS4 General Permit without buy-in from Bellingham's decision makers, residents, and stakeholders.

- In our March 7, 2017, letter, Tighe & Bond provided the Town with an Opinion of Probable Costs based on the 2016 Final MA General Permit Requirements for Permit Years 1 through 5, which estimated that Bellingham can expect to spend approximately $100,000 per year (2016$) to comply with the new Small MS4 permit. These costs did not include drainage system maintenance (e.g., operations and implementation such as street sweeping and catch basin cleaning) or correction of illicit discharges and connections. However, the DPW included a more comprehensive Permit Year 1 or Fiscal Year 2019 program budget of $522,600 in the April 2018 Annual Report to EPA. This is nearly $350,000 less (about 40% less) than the Year 1 estimate in Figure 4.
- Future costs in the 2011 Funding Evaluation also reflect a permit requirement that no longer is included in the final 2016 Small MS4 General Permit (i.e., tracking impervious cover) and reflect developing and implementing a Certified Municipal Phosphorus Program (CMPP), which would not be required without the RDA general permit.
- In addition, the actual costs could be lower if the Town elects to use in-house staff, volunteers, or college interns to complete some or all of the monitoring, data gathering, and reporting requirements.

The 2011 Funding Evaluation also presented estimated capital costs associated with reducing the load by 36.8% (corresponding to a total phosphorus load of 784 lbs/year[2]) with structural BMPs, which is estimated to be $29.7 Million for Bellingham. This equals an approximate cost of $38,000 per pound of reduction in annual phosphorus load. The 2011 Funding Evaluation used a theoretical approach to estimate and compare the potential capital costs to comply with the total phosphorus reduction targets specified in the TMDL, including: 1) scaling-up of costs from a recently completed watershed plan for the Spruce Pond Brook in Franklin, MA; 2) the application of results from a GIS-based spreadsheet model to size and budget for hypothetical, structural BMPs as a function of watershed land cover and treatment volume; and 3) a comparison of stormwater retrofit implementation costs per impervious acre treated from a number of other studies from New England and the Mid- Atlantic.

Ultimately the Evaluation concluded "there is a fairly significant range of costs for implementation of structural controls to achieve phosphorus reductions depending on land use intensity, specific site constraints, control objective, and which method or implementation option one chooses to focus on. One difficulty is that currently there is not a watershed management plan for the upper Charles River watershed that specifies where controls would be most cost effective and where these control measures might be located. The scaled-up assessment from Spruce Pond Brook likely provides the best possible estimate at this time. A careful look at the unit costs compared against the implementation costs from other studies and projects supports this conclusion. In addition, the scaled-up assessment from Spruce Pond Brook accounts for land acquisition costs."

2011 Subwatershed Management Plan

In 2011 Bellingham was awarded a 604b grant from the Massachusetts Department of Environmental Protection. The Charles River Watershed Association (CRWA) along with Nitsch

[2] Note that the 2011 Funding Evaluation cited an existing total phosphorus load of 2,132 lbs/year and a TMDL allowable load of 1,028 lbs/year, with a required load reduction of 1,104 lbs/year for Bellingham. These numbers differ from EPA's final 2016 MS4 General Permit, and the 2016numbers presented in Table 2 are more advantageous to Bellingham.

Engineering worked with the Town to produce a Subwatershed Management Plan for the Town Center area of Bellingham using this grant funding. As part of this Plan, a watershed-based modeling approach was completed for a 0.37 square mile study area (located just to the south and west of Route 495, with Routes 140 and 126 at its center) with 29 drainage areas. Iterative modeling completed identified an *optimal scenario* which was both lowest cost and achieved the goal of collectively removing 41% of the total phosphorus load in the Subwatershed Management Plan study area for a total theoretical price of $212,540.

The study ultimately defined six priority sites and presented conceptual designs for ten structural BMPs (infiltration basins, rain gardens, infiltration trenches, and bioretention system) on these sites with revised estimated costs and expected removal of total phosphorus.

Table 5 lists the six sites, the BMPs designed, the existing phosphorus load, the targeted removal load, design parameters, and the estimated construction cost presented in the proposed design section of the report. The drainage areas for these six sites are contributing 66.18 lbs/year of phosphorus to the Charles River watershed. Using information from Appendix A and the proposed design section of the report, we compiled the ten recommended BMPs as designed, which are estimated to remove 39.78 lbs/year of total phosphorus, slightly less than the modeled 41% for the entire subwatershed. Using information provided for each of the proposed designs included, we total the final estimated construction cost for these six sites is $228,020, slightly more than the theoretical price of $212,540 from the modeling. This results in a unit cost of $5,730 per lb/year or $2,830 per acre of total drainage area or $7,400 per impervious acre. All costs are in 2011 dollars.

TABLE 5

BMP Design Summary from 2011 Subwatershed Management Plan

BMP ID	BMP Location Name	Drainage Area (ac)	Impervious Area (ac)	Land use	Hydrologic Soil Group	Existing Phosphorus Load (lbs/yr)	Estimated Infiltration Rate (in/hr)	Target Phosphorus Removal	Phosphorus Load Reduction (lb/yr)	Water Quality Depth (in)	Water Quality Volume (ft3)	Stormwater Control Surface area (ft2)	Estimated Construction Cost
DD1-A&B	*Bellingham Plaza*	*7.6*	*5.7*	*Commercial*	*A*	*13.2*							
	Infiltration Trenches	1.6	1.6			3.86	4.46	50.90%	1.96	0.24	1400	2250	$7,700
	Rain Gardens	4.5	4.5			9.28	4.46	50.90%	4.72	0.38	6214	8990	$100,300
O6	*Toni and Jamie cul-de-sac*	*4.9*	*1.2*	*Low Density Residential*	*B*	*1.5*							
	Infiltration Basin	4.92	1.15			1.5	0.61	85.10%	1.28	0.61	2670	7170	$14,870
O24 & O24A	*Municipal Building Parking Lot*	*0.7*	*0.7*	*Commercial*	*A*	*0.6*							
	Infiltration Trench	0.68	0.68			0.1	4.46	79.50%	0.08	0.48	1130	820	$7,480
	Rain Gardens	0.11	0.11			0.62	4.46	85.70%	0.53	0.7	280	420	$1,670
O28	*Town Hall/Parking Lot*	*3*	*2.2*	*Commercial*	*A*	*4.37*							
	Infiltration Basin	2.98	2.19			4.37	4.46	85.70%	3.75	0.48	3710	2680	$12,100
S4	*Thayer St. Creek Central*	*27*	*5.6*	*Medium Density Residential*	*B*	*11.1*							
	Infiltration Basin	26.97	5.57			11.1	0.73	64.30%	7.14	0.28	5490	3350	$14,800
O18	*Town Commons*	*37.4*	*15.43*	*Commercial*	*A/C*	*35.41*							
O18A	Infiltration Basin	23.51	9.49			21.33	0.73	73.50%	15.68	0.36	12450	7960	$23,700
O18B	Rain Garden	6.52	2.34			6.31	0.73	58.10%	3.67	0.23	2000	3840	$25,400
O18C	Bioretention System	4.49	1.45			2.89	0.21	34.00%	0.98	0.2	1090	1410	$20,000
TOTAL		**80.6**	**30.83**			**66.18**			**39.78**				**$ 228,020.00**

Tighe & Bond evaluated the expected phosphorus removal and costs of the proposed BMPs presented in the 2011 Subwatershed Management Plan to understand:

1. **How much of the Phase 1 (161 lb/year) Phosphorus Load Reduction Requirement will these BMPs achieve given the phosphorus removal calculation methodology included in the Small MS4 General Permit?**
2. **How cost-effective are these BMPs?**

To answer the question about how much of the Phase 1 load reduction requirement these ten BMPs will address, we first re-calculated the expected phosphorus removal of each BMP using the methods provided in the 2016 Small MS4 General Permit Attachment 3 to Appendix F.

- Phosphorus loads to each of the conceptual BMPs were calculated using the Phosphorus Load Export Rate for Commercial/Industrial Impervious Area in Table 3-1 of Attachment 3 of Appendix F of the permit, and the drainage area of the conceptual BMPs as identified in the 2011 Subwatershed Management Plan. We completed to version of the analysis: one where we assumed the drainage area was a mix of impervious and pervious surface, and one were we assumed the entire drainage area was impervious, as the Plan was not clear about the exact treatment areas. For all calculations we assumed the land use was equivalent to Commercial/Industrial as the BMPs were all located close to Town Center, the most densely developed area of Bellingham.
- The expected phosphorus removal for each BMP was calculated using the BMP performance curves in Attachment 3 of Appendix F for each type of BMP and varying soil infiltration rates. Soil infiltration rates for individual BMPs were assumed to be as shown in the 2011 Subwatershed Management Plan. Using the curves for given infiltration rate, an "interpolation adjustment factor" (IAF) was determined to interpolate between infiltration rates for the performance curves given in the permit to the infiltration rate at the proposed BMP site.

For these ten BMPs, the 2016 Small MS4 General Permit calculations estimate around 40 lbs/year (up to 45 lbs/year if the treatment area includes both pervious and impervious surfaces) would be removed by these BMPs, which is consistent with the estimate of 39.78 included in the 2011 Subwatershed Management Plan.

Tighe & Bond completed site visits in mid-2017 to the proposed BMPs presented in the plan. Two of the BMPs identified in the 2011 report were determined to not be feasible based on their location: the Rain Garden and the Bioretention Basin at the Town Commons, identified as BMP ID O18-B and O18-C, respectively, in the Subwatershed Management Plan. The Rain Garden (BMP ID 018-B) was noted to be in an area with limited space without clearing trees and other vegetation. Further investigation of the drainage system layout and connectivity is necessary to confirm that this location would actually capture runoff from areas in need of stormwater treatment. The Bioretention Basin (BMP ID 018-C) would require significant clearing of trees and a disturbance of a natural area that already is likely provided infiltration for stormwater runoff and uptake of nutrients by trees and other vegetation. A BMP at this location is not an improvement over existing conditions. Therefore, the total expected annual phosphorus load reduction achieved by the remaining eight of the BMPs is 35.7 lbs/day, or 22% of the ten-year PCP reduction requirement of 161 lbs/year. The remaining BMPs appear to be feasible and, because they are low-cost options that reduce a good portion of the Phase 1 PCP reduction requirement, are cost-effective and should be implemented to reduce total annual phosphorus loading.

To answer the question about how cost-effective these BMPs are, we reviewed and updated the costs presented in the 2011 Subwatershed Management Plan as follows:

- The 2011 costs were cited as construction cost. We assume these costs do not include survey, design, permitting, or any contingency.
- We reviewed the cost estimates based on BMP size and increased the 2011 construction costs based on best professional judgement.
- Tighe & Bond utilized the Engineering News Record construction cost index to scale the costs from 2011 to 2017 dollars. We added a 40% project contingency, a 20% Material and Bidding Contingency, and applied a cost of 10% for engineering and design, 5% contingency for permits, and 2% for survey, to each BMP.

Phosphorus removal loads for the BMPs as well as the 2011 construction cost and Tighe & Bond's planning level opinions of cost[3] are included in Table 6.

With a Phase 1 PCP Phosphorus Reduction target of 161 lbs/year for the Urbanized Area of Bellingham within the Charles River watershed, the BMPs listed in Table 6 would correspond to approximately 22% of the total reduction needed for Bellingham by Permit Year 10 at a construction cost of just under $410,000 ($11,500 per lb/year).

Extrapolating those costs, as a best-case scenario the Town could expect to spend approximately $1.865 Million to achieve the Permit Year 10 (Phase 1) PCP reduction requirement of 161 lbs/year, and could expect to spend $7.5 Million to achieve the total load reduction of 642 lbs/year (note that this does not include any non-structural BMPs, which are discussed in the next section of this letter report). It is important to remember that these costs are for lower unit-price BMPs (e.g., infiltration trench, infiltration basin, rain gardens) that are on land already owned by the Town. This also assumes that land is available and does not require purchase or obtaining an easement. Costs will also increase as it becomes more technically difficult to complete retrofits over the 20-year planning period.

Actual costs for structural BMPs will vary depending on type of BMP, land ownership, material and labor costs at the time of construction, and therefore Bellingham can expect to spend somewhere between the costs extrapolated by the 2011 Subwatershed Study ($7.5 Million) and the 2011 Funding Feasibility study ($29.7 Million).

For planning purposes, Bellingham should budget a minimum of $200,000 annually to installing BMP retrofits during the first ten permit years, with a goal of removing approximately 16 lbs/year of total phosphorus.

[3] Tighe & Bond has no control over the cost or availability of labor, equipment or materials, or over market conditions or the Contractor's method of pricing, and that the estimates of probable construction costs are made on the basis of the Tighe & Bond's professional judgment and experience. Tighe & Bond makes no guarantee nor warranty, expressed or implied, that the bids or the negotiated cost of the Work will not vary from this estimate of the Probable Construction Cost

TABLE 6

Subwatershed Management Plan BMP Costs and Total Phosphorus Load Removal – 2017 Update

BMP ID	BMP Location and Type	Updated Expected Phosphorus Load Removal[1] (lbs/year)	2011 Construction Cost from Subwatershed Management Plan	2017 Planning Level Opinion of Cost [2]	Updated Cost per Pound of Phosphorus Removed ($/lb P)
DD1-A&B	***Bellingham Plaza***				
	Infiltration Trenches	2.05	$7,700	$17,000	$8,300
	Rain Gardens	7.09	$100,300	$223,500	$31,500
O6	***Toni and Jamie cul-de-sac***				
	Infiltration Basin	1.54	$14,870	$33,000	$21,500
O24	***Municipal Building Parking Lot***				
	Infiltration Trench	1.09	$7,480	$16,500	$15,200
	Rain Gardens	0.19	$1,670	$4,700	$24,800
O28	***Town Hall/Parking Lot***				
	Infiltration Basins	3.65	$12,100	$27,000	$7,400
S4	***Thayer St. Creek Central***				
	Infiltration Basin	7.69	$14,800	$33,000	$4,300
O18	***Town Commons [2]***				
	Infiltration Basin	12.38	$23,700	$53,000	$4,300
TOTAL		**35.7**	**$182,620**	**$407,700**	**$11,500**

Notes:

1 Phosphorus Load and Removals calculated using Attachment 3 of Appendix F of the 2016 Small MS4 Permit2 Per Section 3, this includes a 40% project contingency, a 20% Material and Bidding Contingency, and applied a cost of 10% for engineering and design, 5% contingency for permits, and 2% for survey, to each BMP.

2 As noted in Section 3, the Town Commons Rain Garden and Bioretention System were determined to be infeasible.

Consideration of Available Land for Retrofits

As part of this letter report, we briefly discussed the Designed Discharge sites identified under the RDA General Permit (i.e., sites in Bellingham with two or more acres of impervious surface) that would have been required to reduce total phosphorus loads from their site by 65%. These sites provide a total of 281.3 acres of impervious area in the Charles River watershed in Bellingham.

It is reasonable to wonder whether or not the Town could achieve the Phase 1 PCP Load Reduction (161 lb/year) on municipal land only. Appendix A of the 2011 Subwatershed Study provided calculations that allowed us to estimate annual pounds of phosphorus removed per impervious area by each BMP. Based on the data in that report, 0.04 to 2.06 lbs/year per acre of impervious area can be reduced, with an average of around 1.15 lbs/year per acre impervious area.

Using GIS that shows Town-owned parcels from the Town's assessor's database and impervious cover from MassGIS, we calculated there is approximately 38.5 acres of impervious surface on municipal parcels in the Charles River watershed. This includes parking and roadways on each site, but does not include streets throughout the watershed. Assuming 100% of this impervious area could be addressed by structural BMPs, the Town would only be able to remove approximately 43 lbs/year of total phosphorus, or about 27% of the Phase 1 PCP Reduction Requirement. **Given these ballpark calculations, the Town of Bellingham will not likely be able to achieve the total Phase 1 PCP Reduction without the help from private parcels or without significant roadway retrofits.**

Consideration of Non-structural Controls

EPA has clarified that non-structural controls are possible mechanisms for the reduction of phosphorus. Since the permit has been issued as a draft, EPA staff have repeatedly stated that 15% of the total load reduction could be achieved with non-structural controls. Both studies reviewed in this letter report also assumed a total of a 15% reduction from non-structural controls:

- The 2011 Sustainable Stormwater Funding Evaluation assumed a 15% reduction of the total load obligation could be achieved through non-structural controls, including:
    - 2% reduction from enhanced street sweeping,
    - 2% reduction from semi-annual catch basin cleaning,
    - 1% reduction from collection of organic wastes and leaf litter; and
    - 10% reduction from a ban on phosphorus in fertilizers.
- The 2011 Subwatershed Management Plan for Bellingham assumed that a reduction of 15% could be achieved through non-structural stormwater management practices such as street sweeping, catch basin cleaning, leaf litter collection and composting, or discontinuing the use of fertilizers that contain phosphorus.

These studies were completed before the phosphorus-containing fertilizer statewide ban and therefore EPA's revised phosphorus reduction target in the 2016 Small MS4 General Permit accounts for the 10% reduction. Based on this, we assume that 5% of the total phosphorus load can be achieved from non-structural controls. For Bellingham, that equates to approximately 1/7 of the total 36% load reduction required.

To understand the cost-benefit of a load reduction from non-structural controls, Tighe & Bond preliminarily evaluated the three nonstructural controls for which the Town may claim phosphorus reduction credit per the 2016 Small MS4 permit:

- Enhanced Street Sweeping Program (credits depend on type of sweeper and frequency)
- Catch Basin Cleaning
- Organic Waste and Leaf Litter Collection Program

Our assessment of potential phosphorus reduction credit based on Attachment 2 to Appendix F of the 2016 permit. EPA and planning studies have been broadly applying a percent load reduction to the total load within the Charles River watershed, however, the methodology presented in Attachment 2 to Appendix F require calculations that consider exact area managed and land use. For example, monthly sweeping with a mechanical broom does not reduce the phosphorus load by 3%, but instead reduces the load from only impervious areas that are swept by 3%. The load that is being addressed is calculated based on the land use in the area of sweeping. Our assumption is that the total reduction that can be achieved by implementing non-structural controls may be overstated. This portion of the letter report explores that assumption.

As part of our assessment, we completed preliminary calculations and found the following:

- Roadways and municipal parking lots within the Charles River watershed portion of Bellingham account for approximately 950 lbs/year of the total phosphorus load (45% of the 2,088 lb/year total load from the watershed as previously shown in Table 2). Sweeping has the potential to remove between 9.5 to 95 lbs/year of total phosphorus. This ten-fold difference is due to the method and frequency of sweeping. For example, 9.5 lbs/year is associated with a 2x/year mechanical broom sweeping program. 95 lbs/year is associated with a weekly high efficiency regenerative air vacuum sweeping program. For monthly sweeping (12x/year) with a mechanical broom, we estimate 28.6 lbs/year of total phosphorus can be reduced, or just under 18% of the 161 lb/year Phase 1 PCP Reduction Requirement. If sweeping with a mechanical broom was reduced to 9 months per year, which is more realistic given that winter typically presents sweeping, approximately 21.5 lb/year could be removed or around 13% of the Phase 1 PCP Reduction Requirement. Over 20 years, this would account for 7% annual of the total phosphorus reduction requirement Currently, the Town sweeps all roads twice per year with a mechanical broom sweeper and therefore this non-structural BMP may be feasible with an increase in DPW operating budget and staffing.
- The areas draining to catch basins are estimated to produce an annual phosphorus load of 333 lbs/year. Cleaning the Town's catch basins twice per year would remove just under 7 lbs/year of total phosphorus, or around 4% of the Phase 1 PCP Load Reduction Requirement, but less than 1% of the 20-year requirement. The Town currently cleans catch basins on an "as-needed" basis. On average, the Town of Bellingham cleans each basin once every three years. Increasing to a bi-annual catch basin cleaning program is a significant increase in effort and cost for the Town with minimal benefit to reduce phosphorus.
- We estimate that an advanced organic waste and leaf collection program could remove 47 lbs/year, or just under 30% of the Phase 1 PCP Reduction Requirement. To be eligible for this credit, Bellingham would have to adopt a new program to gather and remove all landscaping wastes, organic debris, and leaf litter from impervious roadways and parking lots at least once per week for the period of September 1 to December 1 each year. The gathering and removal must occur immediately following any landscaping activities in the Watershed and at additional times when necessary to achieve a weekly cleaning frequency. Disposal of the organic waste must not contribute pollutants to surface water discharges. An enhanced sweeping program of weekly frequency can be used to qualify for this credit, provided that the sweeping is

effective at removing leaf litter and organic materials. This is a significant annual load reduction; however, the program cost and effort would also be significant.

Additional evaluation to define cost-benefit is necessary to understand the total life cycle cost per pound of phosphorus removed by each control to compare to structural BMP implementation. Section 4.2.1 of the 2011 Sustainable Stormwater Funding Evaluation presented operations & implementation costs for Bellingham that hovered around $500,000 a year, increasingly slightly as time progresses to account for inflation and increased costs of services. As clarified in Section 4.2.3, these costs include semi-annual street sweeping program of all streets and directly connected municipal parking lots with a regenerative air sweeper (2% reduction), semi-annual catch basin cleaning (2%), and cleanup of organic waste and leaf litter at least seven times during the year, including weekly during the peak periods of leaf drop in the fall (1% reduction). The 2011 Funding Evaluation does not provide detail sufficient to evaluate the cost of each activity compared to the reduction. **Further evaluation is needed to define costs of non-structural BMPs and refine this conclusion.**

6. Conclusions

To address EPA's 2016 Small MS4 General Permit and the TMDL for the watershed, Town of Bellingham must reduce the discharge of total phosphorus from stormwater to the Charles River watershed. While this letter report does not serve as the PCP, it reviewed the PCP requirements along with the effort and order of magnitude cost to complete the first phase of PCP planning and implementation, which is through Permit Year 10 (i.e., June 30, 2028).

In general, it is our opinion that the Phase 1 PCP phosphorus reduction goal will be possible with an investment from the Town over the next ten years. However, the ultimate 20-year phosphorus reduction goal will be technically difficult and very expensive due to limited municipal land area available for retrofits and without wide-spread participation from private property owners by either incentives from the Town (e.g., stormwater utility with a credit system) or a new mandate such as the Charles River RDA permit.

This letter provided information to Bellingham to guide big picture decisions to begin the PCP:

1. Should the PCP be implemented for the whole Town within the Charles River watershed or only for the regulated (Urbanized) area in the watershed?
2. What phosphorus reduction progress is quantifiable since 2005?
3. What, if any, recommendations from previous studies are actually cost-effective and may warrant inclusion in the PCP?

The following summarizes results of our evaluation completed in this letter.

Should the PCP be implemented for the whole Town within the Charles River watershed or only for the regulated (Urbanized) area in the watershed?

Because EPA's Small MS4 General Permit allows communities to decide to address the load from either the community area within the watershed or the load from the Urbanized Area, we considered the two options and determined that Bellingham would be best served by undertaking the PCP within the Urbanized Area only. This determination was based on:

- The load reduction for the Urbanized Area (642 lbs/year) is 88 lbs/year less than the total watershed area (730 lbs/year), which equates to 5 to 15 additional structural BMPs, or an approximate additional cost of $1.01 Million or more (based on $11,500 per lb/year as described in Section 4 of this letter report).

- There is significantly less impervious cover outside of the Urbanized Area and therefore there are fewer opportunities for siting BMPs that provide a cost-effective load reduction.
- There are 61 town-owned parcels within the entire watershed and all but two are within the urbanized area. Municipally-owned parcels are the first place to consider structural BMP installation as they are within the Town's control, further indicating there are more opportunities within the Urbanized Area to install retrofits on Town-owned parcels.

At this time, we recommend Bellingham undertake the PCP within the Urbanized Area only. However, if there was a compelling reason to expand the PCP to cover the entire watershed (e.g., substantial private development, or US Census dramatically expands the Urbanized Area in the future), the PCP extent could be updated in a later phase of planning. In addition, we recommend non-structural controls (e.g., sweeping, catch basin cleaning), continue to be completed within the entire watershed.

What phosphorus reduction progress is quantifiable since 2005?

Based on our discussions with Town staff and review of mapping, we have determined that the total phosphorus load in Bellingham within the Charles River watershed has likely *increased* since 2005. At a minimum, Bellingham must reduce the total phosphorus by 161 lbs/year by Permit Year 10 (2028) through structural and non-structural controls.

Town staff should continue to gather records for development and redevelopment projects within the Charles River watershed to identify structural BMP types and locations and to quantify the total phosphorus load reduction achieved by these BMPs using EPA's required calculations. This effort will be coupled with the permit mapping requirement for Bellingham to locate public and private structural stormwater BMPs.

What, if any, recommendations from previous studies are actually cost-effective and may warrant inclusion in the PCP?

EPA Region 1 commissioned a study completed by Horsley Witten that resulted in the 2011 report titled *Sustainable Stormwater Funding Evaluation for the Upper Charles River Communities of Bellingham, Franklin, and Milford, MA* ("2011 Funding Evaluation"). While their current program costs are reasonable, the future stormwater program costs for both annual operations ($799,000 to $1,029,000) and structural BMPs ($29.7 Million or approximately $38,000 per pound of reduction in annual phosphorus load) likely overestimate the total obligation for compliance based on the 2016 Small MS4 General Permit.

The 2011 Subwatershed Management Plan for Bellingham, funded by a 604b grant from the Massachusetts Department of Environmental Protection, and completed by the Charles River Watershed Association (CRWA) along with Nitsch Engineering, found six sites[4] that receive 66.18 lbs/year of phosphorus loading to the Charles River watershed could be retrofitted by ten BMPs designed to remove 39.78 lbs/year of total phosphorus at an estimated construction cost of $228,000. This results in a unit cost of $5,730 per lb/year or $2,830 per acre of total drainage area or $7,400 per impervious acre. All costs are in 2011 dollars.

Tighe & Bond evaluated the expected phosphorus removal and costs of the proposed BMPs presented in the 2011 Subwatershed Management Plan and found that the total expected annual phosphorus load reduction achieved by eight of the BMPs is 35.7 lbs/day, or 22% of

[4] Note that two of these sites were omitted based on site walk with Town Staff.

the ten-year PCP reduction requirement of 161 lbs/year. These BMP estimates are significantly more cost-effective than the estimates in the 2011 Funding Evaluation, as the average BMP reduction is $11,500 per lb/year (compared to $38,000 per pound). Based on this estimate, Town can expect to spend approximately $1.865 Million to achieve the Permit Year 10 (Phase 1) PCP reduction requirement, and can expect to spend somewhere over $7.5 Million (note that this does not include any non-structural BMPs) to achieve the total load reduction of 642 lbs/year, which is significantly less than the $29.7 Million estimated by Horsley Witten for non-structural BMPs. In reality, the actual cost for structural BMPs is likely somewhere between the two estimates, and the 2011 Subwatershed Management Plan selected simple, cost-effective BMPs, in the most easily retrofitted drainage areas. Retrofitting with other, most costly BMPs, will increase the structural cost, but not likely as high as the estimates in the 2011 Subwatershed Management Plan. Tighe & Bond completed site visits to the proposed BMPs presented in the plan and determined these BMPs are cost-effective and should be implemented to reduce total annual phosphorus loading.

Tighe & Bond preliminarily evaluated the three nonstructural controls for which the Town may claim phosphorus reduction credit per the 2016 Small MS4 Permit to understand the cost-benefit of a load reduction from non-structural controls. We found that even the current level of street sweeping provides a cost-effective credit to Bellingham, and the Town should consider increasing the frequency as this is likely one of the most cost-effective BMPs. Catch basin cleaning and an Organic Waste and Leaf Litter Collection Program will require significant increases in the program and therefore increase in the cost. A full life cycle cost for non-structural BMPs is necessary to understand the cost associated with each pound of total phosphorus reduced by each type of BMP. Further evaluation of costs for structural and non-structural BMPs is necessary to compare the true cost-benefit.

We hope this letter report helps Bellingham begin to address EPA's 2016 Small MS4 General Permit Phosphorus Control Plan requirements. We would be pleased to discuss any portion of this letter report in further detail and look forward to continuing to assist the Town of Bellingham with undertaking a cost-effective stormwater management program.

Very truly yours,

TIGHE & BOND, INC.

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Janet Moonan, P.E.
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Jim Kupfer, Town Planner/Zoning Compliance Officer
Tom Mahanna, Tighe & Bond

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TOWN OF BELLINGHAM

STORMWATER FEE SCHEDULE
Effective FY 2021

Description Fee Class	Impervious Area (ERUs)	Quarterly Fee	Annual Cost
Small Residential			
Single Family Residential (SFR)	1 ERU	$24	$96
Condominium Unit	1 ERU	$24	$96
2 & 3 Family Residential (R2)	2 ERUs	$48	$192
Senior (Over 65 SFR) & Lifeline	0.5 ERU	$12	$48
Non-Residential and Residential Greater than 3 units			
Proportional	Parcel # of ERUs	x $24 / Quarter	

Notes:

1. The Equivalent Residential Unit (ERU) is a commonly used unit of measure for impervious area and is used to establish stormwater fees that are fair, equitable, and easily understood. One ERU is defined as the median amount of impervious cover of all single-family residential (SFR) parcels in Town (3,025 square feet in Bellingham). The impervious area of all other parcels is then divided by this value to obtain the number of Equivalent Residential Units for each parcel. The impervious areas for each parcel was determined by using the 2016 data and mapping available from MassGIS.

2. SFR properties are charged a uniform fee of 1 ERU. Condominium unit owners will be charged 1 ERU. Two and three-family residential properties are charged a fee of 2 ERUs. Large Residential (4 or more units) and Non-Residential parcels will be charged based upon the number of ERUs (impervious surface / 3,025 SF).

3. Proportional ERU per property shall be rounded to a whole number. Decimal Values of 0.5 or greater shall be rounded up. Decimal values of less than 0.5 will be rounded down. (Example: ERU calculated to be 1.5 shall be billed at 2.0 ERU. ERU calculated to be 1.49 shall be billed at 1.0 ERU)

4. Property owners can apply for stormwater credits to reduce their costs. See the Bellingham Stormwater Utility Credit Policy available at the Department of Public Works for more information. The Bellingham Credit Policy will be published by September 15, 2020.

Approved
Bellingham Select Board

Date: August 24, 2020

Appendix C
Supporting Calculations for Phosphorus Loading Rate

BELLINGHAM CRWA2023 LULC, Nearmap Mar2023 IA, Remove DOT property

			Directly Connected Impervious Area									Pervious Area Phosphorus Load																			Disconnected Impervious Area			
				Sutherland Coeffs								Perv HSG Area (ac)							Phosphorus Export Loading Rate (lb/ac/yr)							Avg Annual Phosphorus Export Load (lb/yr)										
Phosphorus Land Use Group	Total Area (ac)	Impervious Area (ac)	Percent Impervious	A	B	Percent Directly Connected Impervious Area (%)	%DCIA Check	Directly Connected Impervious Area (ac)	Directly Connected Impervious Area (ac) Check	Phosphorus Loading Export Rate (lb/ac/yr)	Avg Annual Phosphorus Export Load (lb/yr)	A	B	C	C/D	D	Unk	Total	A	B	C	C/D	D	Unk	A	B	C	C/D	D	Unk	Total	Disconnected Impervious Area (ac)	Composite Phosphorus Export Loading Rate (lb/ac/yr)	Avg Annual Phosphorus Load (lb/yr)	Total Avg Annual Phosphorus Load (lb/yr)
Commercial	330.2	194.8	59.00%	0.4	1.2	53.3%	0.5335	176.1	313.5	1.78	313.5	94.5	15.3	17.4	1.3	1.8	4.9	135.4	0.03	0.12	0.21	0.29	0.37	0.21	2.8	1.8	3.7	0.4	0.7	1.0	10.4	18.7	0.1	1.4	325.4
Industrial	248.5	119.2	47.95%	0.4	1.2	41.6%	0.4159	103.4	184.0	1.78	184.0	71.0	8.5	36.8	5.2	2.0	5.9	129.4	0.03	0.12	0.21	0.29	0.37	0.21	2.1	1.0	7.7	1.5	0.8	1.2	14.4	15.8	0.1	1.8	200.1
High-density residential	276.0	97.6	35.36%	0.4	1.2	28.9%	0.2886	79.7	184.8	2.32	184.8	97.2	45.8	21.2	7.5	4.9	1.9	178.4	0.03	0.12	0.21	0.29	0.37	0.21	2.9	5.5	4.4	2.2	1.8	0.4	17.2	17.9	0.1	1.7	203.8
Medium-density residential	435.0	122.0	28.04%	0.1	1.5	14.9%	0.1485	64.6	126.6	1.96	126.6	181.2	53.6	30.9	38.8	8.0	0.6	313.0	0.03	0.12	0.21	0.29	0.37	0.21	5.4	6.4	6.5	11.2	2.9	0.1	32.7	57.4	0.1	6.0	165.3
Low-density residential	615.4	124.9	20.29%	0.1	1.5	9.1%	0.0914	56.3	110.3	1.96	110.3	230.0	108.6	96.0	37.2	17.4	1.3	490.5	0.03	0.12	0.21	0.29	0.37	0.21	6.9	13.0	20.2	10.8	6.4	0.3	57.6	68.6	0.1	8.1	175.9
Highway	12.4	5.8	46.58%	0.1	1.5	31.8%	0.3179	3.9	7.7	1.95	7.7	5.1	0.9	0.2	0.1	-	0.3	6.6	0.03	0.12	0.21	0.29	0.37	0.21	0.2	0.1	0.0	0.0	-	0.1	0.4	1.8	0.1	0.1	8.2
Forest	2635.0	20.9	0.79%	0.01	2	0.00%	0.0001	0.0	0.0	1.52	-	1,088.9	949.7	269.1	124.1	136.7	45.5	2,614.1	0.13	0.13	0.13	0.13	0.13	0.13	141.6	123.5	35.0	16.1	17.8	5.9	339.8	20.9	0.1	2.7	342.5
Open land	227.9	6.2	2.70%	0.1	1.5	0.4%	0.0044	1.0	1.5	1.52	1.5	122.5	32.5	44.2	14.3	4.1	4.3	221.8	0.03	0.12	0.21	0.29	0.37	0.21	3.7	3.9	9.3	4.1	1.5	0.9	23.4	5.1	0.1	0.5	25.5
Agriculture	46.0	0.4	0.94%	0.01	2	0.00%	0.0001	0.0	0.0	1.52	-	4.4	17.8	21.3	1.8	0.2	-	45.6	0.45	0.45	0.45	0.45	0.45	0.45	2.0	8.0	9.6	0.8	0.1	-	20.5	0.4	0.5	0.2	20.7
Total	4,826.4	691.7	14%			10%		484.9	928.4		928.4	1,894.9	1,232.8	537.1	230.3	175.2	64.6	4,134.8							167.6	163.3	96.4	47.2	32.0	9.9	516.4	206.7		22.5	**1,467.3** lb/yr
																																		665.6 kg/yr

Appendix D
Supporting Calculations for Phosphorus Non-Structural Controls

Phosphorus Credits from Non-Structural BMPs
Catch Basin Cleaning

Land Use Category	Impervious Area (acres)	PLER (lbs/acre/yr)	PRF	P Credit (lb/year)
Agriculture	0.002936728	1.52	0.02	0.0001
Commercial	139.47052	1.78	0.02	4.9652
Forest	12.47518921	1.52	0.02	0.3792
High Density Residential	67.56879425	2.32	0.02	3.1352
Highway	35.32570648	1.34	0.02	0.9467
Industrial	41.99178314	1.78	0.02	1.4949
Low Density Residential	69.21046448	1.52	0.02	2.1040
Medium Density Residential	99.9359436	1.96	0.02	3.9175
Open Land	2.397780657	1.52	0.02	0.0729
			TOTAL	17.0157

Phosphorus Credits from Non-Structural BMPs
Street Sweeping

Land Use	PLER	Impervious Area Swept (acres)	Sweeping Technology	Sweeping Frequency	Technology | Frequency	P-Reduction Factor	% of Year Swept	Credit (lb/yr)
COM/IND	1.78	57.9	Mechanical Broom	2/year (spring and fall)	Mechanical Broom | 2/year (spring and fall)	0.01	N/A	1.030
Parking Lots	1.78	48.3	Mechanical Broom	2/year (spring and fall)	Mechanical Broom | 2/year (spring and fall)	0.01	N/A	0.859
HDR	2.32	95.8	Mechanical Broom	2/year (spring and fall)	Mechanical Broom | 2/year (spring and fall)	0.01	N/A	2.222
LDR	1.96	80.1	Mechanical Broom	2/year (spring and fall)	Mechanical Broom | 2/year (spring and fall)	0.01	N/A	1.570
MDR	1.96	80.5	Mechanical Broom	2/year (spring and fall)	Mechanical Broom | 2/year (spring and fall)	0.01	N/A	1.578
FOR IA	1.52	126.4	Mechanical Broom	2/year (spring and fall)	Mechanical Broom | 2/year (spring and fall)	0.01	N/A	1.921
HWY	1.95	24.2	Mechanical Broom	2/year (spring and fall)	Mechanical Broom | 2/year (spring and fall)	0.01	N/A	0.472
OL	1.52	20.0	Mechanical Broom	2/year (spring and fall)	Mechanical Broom | 2/year (spring and fall)	0.01	N/A	0.304
AG IA	1.52	4.8	Mechanical Broom	2/year (spring and fall)	Mechanical Broom | 2/year (spring and fall)	0.01	N/A	0.073
Impervious Area Swept	537.9							
Streets Swept	489.7							
Total Sweeping Credit (lb/yr)	**10.030**							

Appendix E
Supporting Documentation for Phosphorus Structural Controls

Tighe&Bond
Engineers | Environmental Specialists

N

BMP Location

Area outlined in orange is treated by infiltration basin

32 LF 15" HDPE @ 1.56%

FES 1-A
INV IN=280.70 W

PROPOSED SEDIMENT FOREBAY

PROPOSED INFILTRATION BASIN

DMH 2075
RIM=289.40
INV IN=285.40 SW
INV OUT=281.20 E

OS 1-A
RIM=278.69
INV OUT=274.00 E

CONST. EMERGENCY SPILLWAY RRA-A (SEE DETAIL)

50 LF 15" HDPE @ 1.60%

60 LF 15" HDPE @ 2.50%

51 LF 12" RCP @ 20.00%

~4' OF COVERAGE BETWEEN DRAINAGE AND COND.

CB 1152
RIM=277.00
INV IN=272.50 E
INV OUT=270.50 NE

BORE NEW INLET (272.5')

HSG: D

HSG: A

CB 2065
RIM=291.70
INV IN=286.20 W
INV OUT=286.10 NE
BORE NEW OUTLET (286.10')

104 LF 12" HDPE @ 2.02%

43 LF 12" HDPE @ 1.40%

70 LF 12" HDPE @ 0.86%

CB 1904
RIM=294.50
INV OUT=291.00 NW

BORE NEW INLET (289.70')

LF 12" HDPE @ 1.59%

INV IN=289.70' SE
INV OUT=289.60 NE

DMH 1952
RIM=293.80
INV IN=289.00 SW
INV OUT=288.90 NE

CB 1902
RIM=294.80

CB 1965
RIM=291.80
INV IN=288.30 SW
INV OUT=288.30 E

DMH 1952
RIM ELEV.=293.8'
(1965) 12" RCP INV.=288.9'
(1903) 12" RCP INV.=288.0'
(A) 12" RCP INV.=287.9'

CB 1965
RIM ELEV.=291.8'
(BLDG) 12" RCP INV.=288.8'
(1952) 12" RCP INV.=288.5'
(2065) 12" RCP INV.=288.3'

CB 2065
RIM ELEV.=291.7'
(1965) 12" RCP INV.=286.2'
(11493) 15" RCP INV.=286.0'

SMH 2093
RIM ELEV.=294.8'
(1902) 8" PVC INV.=286.4'
(A) 8" PVC INV.=286.4'

SMH 1902
RIM ELEV.=295.3'
(2093) 6" PVC INV.=286.9'

CB 1493
RIM ELEV.=291.5'
(2065) 15" RCP INV.=284.6'
(A) 15" RCP INV.=284.6'
PIPE DOES NOT APPEAR TO CONNECT TO 1546

CB 1207
RIM ELEV.=279.3'
(1240) 12" RCP INV.=275.8'
SEWER FORCE MAIN PUMP STATION

CB 1609
RIM ELEV.=293.0'
(A) 10" RCP INV.=290.1'

CB 1546
RIM ELEV.=291.3'
(A) 8" PVC INV.=289.0'
PAVEMENT PATCH
POSSIBLE OLD STRUCTURE LOCATION

CB 1558
RIM ELEV.=291.0'
(A) 12" HDPE INV.=286.6'

CB 1240
RIM ELEV.=284.9'
(A) 15" RCP INV.=280.7'
TO POSSIBLE OLD STRUCTURE
(1207) 12" RCP INV.=275.2'
(OUTFALL) 15" RCP INV.=275.1'

TBM 5732A
"X" CUT OVER HYDRANT
MAIN OUTLET BOLT
ELEV.=295.75

TBM 5732B
"X" CUT OVER HYDRANT
MAIN OUTLET BOLT
ELEV.=282.85'

ERNEST A. TAFT JR. HISTORICAL MUSEUM

BELLINGHAM MUNICIPAL CENTER

SCHOOL ADMINISTRATION

MECHANIC STREET

COMMON STREET

MAP 45 LOT 54

MAP 50 LOT 57-1

MAP 50 LOT 36

BLOCK RET. WALL

WOODEN RAMP

WOODEN GUARDRAIL

CONC. JERSEY BARRIER (TYP.)

GRAVEL ACCESS DRIVE

PAVED SIDEWALK

CONC. RET. WALL

STOP

DO NOT ENTER

SCALE IN FEET
0 20' 40'
GRAPHIC SCALE

CONSTRUCTION DRAWINGS

MUNICIPAL CENTER DRAINAGE IMPROVEMENTS

CONTRACT 2019-MCD

Town of Bellingham

Bellingham, MA

MARK	DATE	DESCRIPTION

PROJECT NO:	B-0852
DATE:	05/15/2019
FILE:	B-0852-DESIGN.dwg
DRAWN BY:	SO, CJK
CHECKED:	JSM, AGB
APPROVED:	BLM, TJM

POST DEVELOPMENT

SCALE: 1"=20'

C-101

Last Saved: 5/15/2019
Printed: May 16, 2019 - 2:42pm By: HRB
Tighe & Bond: J:\0\B0852 Bellingham MS4 Engineering\003 319 Grant\Drawings_Figures\AutoCAD\XrefsB-0852-DESIGN.dwg

Stormwater Long-Term Operation and Maintenance Plan for the Infiltration Basin located at the Municipal Center, 10 Mechanic Street, Bellingham, MA

Introduction and Responsibilities

The following Long-Term Operation and Maintenance (O&M) Plan provides guidance and procedures for proper pollution prevention and stormwater management system maintenance following completion of construction of the stormwater Best Management Practice (BMP) at the Town Municipal Center located at 10 Mechanic Street. Figure 1 shows the BMP location.

FIGURE 1: Approximate location of the BMP at 10 Mechanic Street

The Massachusetts Department of Environmental Protection (MassDEP) Stormwater Standard 9 requires the development and implementation of an O&M plan to maintain or improve stormwater runoff quality and quantity. However, this project was not subject to jurisdiction to the MassDEP Stormwater Standards or a Conservation Commission Order of Conditions. Therefore, the stormwater management system is required to be maintained in compliance with the U.S. Environmental Protection Agency's General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), which requires a minimum of annual inspection. Additional recommendations for maintenance of system components consistent with the Massachusetts Stormwater Handbook is included herein.

Stormwater Management System Owner:

Town of Bellingham
10 Mechanic Street
Bellingham, MA 02019

Because the BMP is located on town-owned property, we do not anticipate transfer of the property in the future and therefore there are no provisions included in this O&M plan for notification to future owners.

Party Responsible for Operation and Maintenance:

Town of Bellingham Department of Public Works
26 Blackstone Street
Bellingham, MA 02019

Estimated Annual Operation and Maintenance Budget

The Department of Public Work will add the operations and maintenance of this basin to the list of over 60 basins currently on the list and being maintained by DPW staff. The addition of one basin is and incidental cost and has been in the budget for several years. Effective, July 1, 2020, funding will be from the Stormwater Utility Enterprise Fund which will reduce the likelihood that general fund revenue issue effect the operations and maintenance of the basin.

BMP Operation and Maintenance

Each component of the BMP requires specific maintenance. The record drawings for the project indicate the location of the BMPs implemented as part of the project. The following sections reference the MA Stormwater Handbook Volume 2, Chapter 2 and describe the maintenance requirements for each component of the BMP. A table is included at the end of each section summarizing the recommended maintenance activities and frequency.

Visual Inspection

EPA's MS4 General Permit requires annual inspection of the BMP, at a minimum.

Sediment Forebays

Sediment forebays should be inspected annually, at a minimum, and be cleaned out at least four times per year and when sediment depth is between 3 to 6 feet. The visual inspection will ascertain whether the forebay is functioning properly (no blockages or obstructions to the outlet and/or hood) and to measure the amount of solid materials that have accumulated in the sump. This will be done with a calibrated dipstick, tape measure or other measuring instrument so that the depth of deposition in the sump can be tracked. Inspections will be completed visually from ground level.

Sediments and associated pollutants are removed only when sediment forebays are actually cleaned out, so regular maintenance is essential. Frequently removing accumulated sediments will make it less likely that sediments will be resuspended. The floor and sidewalls of the sediment forebay were stabilized before making it operational, otherwise the practice will discharge excess amounts of suspended sediments. When mowing grasses, the grass height should be kept no greater than 6 inches. Mower blades should be set no lower than 3 to 4 inches. Signs of rilling and gullying should be checked and repaired as needed. After removing the sediment, any vegetation damaged during the clean-out should be replaced by either reseeding or re-sodding. When reseeding, practices such as hydroseeding with a tackifier, blanket, or similar practices

should be incorporated to ensure that no scour occurs in the forebay, while the seeds germinate and develop roots.[1]

TABLE 1
Sediment Forebay Maintenance Activity Summary

Activity	Recommended Frequency
Visually inspect	At a minimum, once per year
Clean sediment forebays	Four times per year and when sediment depth is between 3 to 6 feet

Infiltration Basin

The infiltration basin should be inspected after every major storm during the first three months of operation and, at a minimum, once per year thereafter and when there are discharges through the high outlet orifice to ensure it is operating as intended. Inspections should check for evidence of subsidence, erosion, cracking or tree growth on embankments, damage to the emergency spillway, and sediment accumulation. Necessary repairs should be made immediately. Sediment accumulation should be removed at least once every 10 years or when the basin is 25% full. The buffer area, side slopes of the embankment, the emergency overflow, and the basin bottom should be mowed on grassed areas and raked on stone areas at least twice per year. Trash and debris, grass clippings, and accumulated organic matter should be removed at least twice per year.

Preventative maintenance should be performed at least twice per year. Pretreatment devices should be inspected and cleaned every other month and at least twice a year and after every major storm event.[2]

TABLE 2
Infiltration Basin Maintenance Activity Summary

Activity	Recommended Frequency
Preventative maintenance	Twice per year
Inspect to ensure proper functioning	After every major storm during first 3 months of operation and a minimum of once per year thereafter and when there are discharges through the high outlet orifice
Mow the buffer area, side slopes, and basin bottom if grassed floor; rake if stone bottom; remove trash and debris; remove grass clippings and accumulated organic matter	Twice per year as needed

[1] Massachusetts Stormwater Handbook, Volume 2, Chapter 2, page 16

[2] Massachusetts Stormwater Handbook, Volume 2, Chapter 2, page 87

Record Keeping Responsibilities

An O&M log is also attached to this document to track the scheduled maintenance activities. All DPW maintenance and recordkeeping is moving towards electronic / on line data entry. Paper forms will likely be eliminated within two or three years.

As part of the operation and maintenance of the stormwater management system, the responsible party should *maintain an operation and maintenance log for the last three years.*

The log should record all operation and maintenance activities, including inspections, repairs, replacement and disposal. For disposal, the log should indicate the type of material and the disposal location.

The Town of Bellingham will make the logs available upon request. Members and agents of MassDEP will also be allowed to enter and inspect the premises to evaluate and ensure that the responsible party complies with the operation and maintenance plan for each BMP.

J:\B\B0852 Bellingham MS4 Engineering\003 319 Grant\OM Plan\SW-OM.doc

CONSTRUCTED STORMWATER BMP INSPECTION FORM

Date of Inspection	
Start Time	

BMP Type/Description:

Structural Pretreatment

- ☐ Oil/Grit Separators
- ☐ Sediment Forebays
- ☐ Vegetated Filter Strips

Treatment

- ☐ Bioretention Areas/Rain Gardens
- ☐ Constructed Stormwater Wetlands
- ☐ Extended Dry Detention Basins
- ☐ Sand and Organic Filters
- ☐ Wet Basins

Conveyance

- ☐ Drainage Channels
- ☐ Grassed Channels
- ☐ Water Quality Swale

Infiltration

- ☐ Dry Wells
- ☐ Infiltration Basins
- ☐ Infiltration Trenches
- ☐ Subsurface Structures

Other

- ☐ Dry Detention Basin
- ☐ Porous Pavement
- ☐ Other:

Proprietary

- ☐ Proprietary Separators
- ☐ Proprietary Media Filters
- ☐ Contech Vortech
- ☐ Contech Stormceptor
- ☐ Contech CDS

BMP Address and Location on Site	
Inspector Name, Title, and Contact Information	

Type of Inspection:

☐ Routine ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event

Weather at time of this inspection:

☐ Clear ☐ Cloudy ☐ Rain ☐ Sleet ☐ Fog ☐ Snow ☐ High Winds

☐ Other: Temperature (F):

Photo(s) Taken: Yes ☐ No ☐ If Yes, describe:

Are there any discharges occurring at the time of inspection? Yes ☐ No ☐ If yes, are any physical indicators present in the flow? If yes, describe below:

Indicator & Description	**Relative Severity Index (1-3)**
☐ **Color present:** ☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☐ 1 - Faint ☐ 2 - Clearly visible ☐ 3 - Brightly colored

CONSTRUCTED STORMWATER BMP INSPECTION FORM

Indicator & Description	Relative Severity Index (1-3)
☐ **Turbidity present:** ☐ Slight cloudiness ☐ Cloudy ☐ Opaque	☐ 1 - Faint ☐ 2 - Clearly visible ☐ 3 - Bright
☐ **Floatables present (does not include trash):** ☐ Sewage (toilet paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 - Few/slight ☐ 2 - Some ☐ 3 - Many/obvious
☐ **Odor present**: ☐ Sewage ☐ Sulfide ☐ Rancid/sour ☐ Petroleum/gas ☐ Other:	☐ 1 - Faint ☐ 2 - Easily detected ☐ 3 - Noticeable from a distance

Items Inspected	☐ Erosion ☐ Invasive species ☐ Dead vegetation ☐ Trash/sediment/debris ☐ Grates	☐ Filters/filter media ☐ Basins ☐ Slope integrity ☐ Cracking ☐ Clogging	☐ Standing water ☐ Deterioration ☐ Other:
Maintenance Performed	☐ Repaired erosion ☐ Removed invasive species ☐ Removed sediment/trash/debris ☐ Pruned	☐ Reseeded ☐ Mowed ☐ Replaced vegetation ☐ Replaced media ☐ Mulched	☐ Cleaned ☐ Raked ☐ Other:
Additional Maintenance Required	Yes ☐ No ☐	If yes, describe:	
Other Notes			

Operation and Maintenance Activities Completed at the Infiltration Basin located at the Municipal Center, 10 Mechanic Street, Bellingham, MA

TO: MassDEP

FROM: Tighe & Bond

COPY: Town of Bellingham

DATE: June 30, 2020

This memorandum outlines the operation and maintenance activities that have commenced since completion of BMP implementation, which was November 15, 2019, as documented in project photographs:

- During first three months, the infiltration basin was inspected after major precipitation events to confirm its operation and that soils were properly stabilized.
- Starting after snowmelt in 2020:
    - Sediment forebay has been visually observed routinely. Note that cleaning of the sediment forebay has not yet been necessary.
    - The infiltration basin was visually observed once when there was a discharge through the high outlet orifice. Appears to be functioning as desired.
- Mowing, trash and debris removal, etc., at the infiltration basin has not yet been needed.

B-0852-003
June 30, 2020

Malcolm Harper
Massachusetts Department of Environmental Projection
Bureau of Water Resources
Address 2
City, State Zip

Re: **Phase 1 Implementation of Bellingham's Subwatershed Management Plan Project # 18-05/319**

Mr. Harper

The infiltration basin funded by Project Number 18-05/319, installed at the Town of Bellingham Municipal Center located at 10 Mechanic Street, Bellingham, MA, was constructed according to design specifications prepared by Tighe & Bond.

The estimations of pollutant removal provided in the final report prepared to document work with Project Number 18-05/319 were determined using the appropriate estimation model(s) and applied according to the procedures prescribed for the model.

Removal for pollutants was estimated using information from the final design combined with the Simple Method (Schueler, 1987) and pollutant removal estimates from the Massachusetts Stormwater Handbook for the infiltration basin. The calculations assume:

- An annual runoff of 38.9 inches based on the Simple Method
- 0.92 acres of impervious area treated
- Installation of stormwater infiltration basin with required sediment forebay as pretreatment
- Stormwater runoff contains median pollutant concentrations commonly found in stormwater (TSS 54.5 mg/L, total phosphorus 0.26 mg/L, total nitrogen 2.0 mg/L, Fecal Coliform 1,500 col/mL, copper 11.1 ug/L, lead 50.7 ug/L, and zinc 129 ug/L) per the Simple Method
- The infiltration basin achieves 80% removal of TSS, 65% removal of total phosphorus, 55% removal of total nitrogen, 90% removal of fecal coliform, and 88% removal of metals per Massachusetts Stormwater Handbook.
- The annual loads removed are therefore:
    a. Phosphorus: 1.4 lbs/year
    b. TSS: 353 lbs/year
    c. Nitrogen: 8.9 lbs/year
    d. Coliform: 4,997 1,000 cfu/mL
    e. Copper: 0.1 lbs/year
    f. Lead: 0.4 lbs/year
    g. Zinc: 0.9 lbs/year

To the best of my knowledge these are reasonable estimates using appropriate methods. Documentation is kept on file by the Town of Bellingham and is available for review by MassDEP/EPA upon request.

Regards,

TIGHE & BOND, INC.

Janet Moonan, PE
Project Manager

Enclosures: The Simple Method to Calculate Urban Stormwater Loads, New York State Stormwater Management Design Manual Appendix A

Copy: Donald DiMartino, Director of Public Works

The Simple Method to Calculate Urban Stormwater Loads

This appendix presents data and methodologies for using the Simple Method (Schueler, 1987) to estimate pollutant load from a site or drainage area. This appendix is meant for planning purposes only, and should not be used for SMP design.

The Simple Method estimates stormwater runoff pollutant loads for urban areas. The technique requires a modest amount of information, including the subwatershed drainage area and impervious cover, stormwater runoff pollutant concentrations, and annual precipitation. With the Simple Method, the investigator can either break up land use into specific areas, such as residential, commercial, industrial, and roadway and calculate annual pollutant loads for each type of land, or utilize more generalized pollutant values for urban runoff. It is also important to note that these values may vary depending on other variables such as the age of development.

The Simple Method estimates pollutant loads for chemical constituents as a product of annual runoff volume and pollutant concentration, as:

$$\mathbf{L = 0.226 * R * C * A}$$

Where:	L	=	Annual load (lbs)
	R	=	Annual runoff (inches)
	C	=	Pollutant concentration (mg/l)
	A	=	Area (acres)
	0.226	=	Unit conversion factor

For bacteria, the equation is slightly different, to account for the differences in units. The modified equation for bacteria is:

$$\mathbf{L = 103 * R * C * A}$$

Where:	L	=	Annual load (Billion Colonies)
	R	=	Annual runoff (inches)
	C	=	Bacteria concentration (1,000/ ml)
	A	=	Area (acres)
	103	=	Unit conversion factor

A.1 Pollutant Concentrations

Stormwater pollutant concentrations can be estimated from local or regional data, or from national data sources. Table A.1 presents typical concentration data for pollutants in urban stormwater.

Table A.1 National Median Concentrations for Chemical Constituents in Stormwater

Constituent	Units	Urban Runoff
TSS	mg/l	54.5[1]
TP	mg/l	0.26[1]
TN	mg/l	2.00[1]
Cu	ug/l	11.1[1]
Pb	ug/l	50.7[1]
Zn	ug/l	129[1]
F Coli	1,000 col/ ml	1.5[2]

Source:

1: Pooled NURP/USGS (Smullen and Cave, 1998)

2: Schueler (1999)

In addition, some source areas appear to be particularly important for some pollutants. Table A.2 summarizes these data for several key source areas. It is important to note that, because the Simple Method computes runoff based on an impervious area fraction, it cannot be easily used to isolate pervious sources, such as lawns. However, a user can evaluate particular hotspots, such as auto recyclers, separately. In addition, a composite runoff concentration can be developed based on the fraction of lawn, driveway, and roof on a residential site, for example.

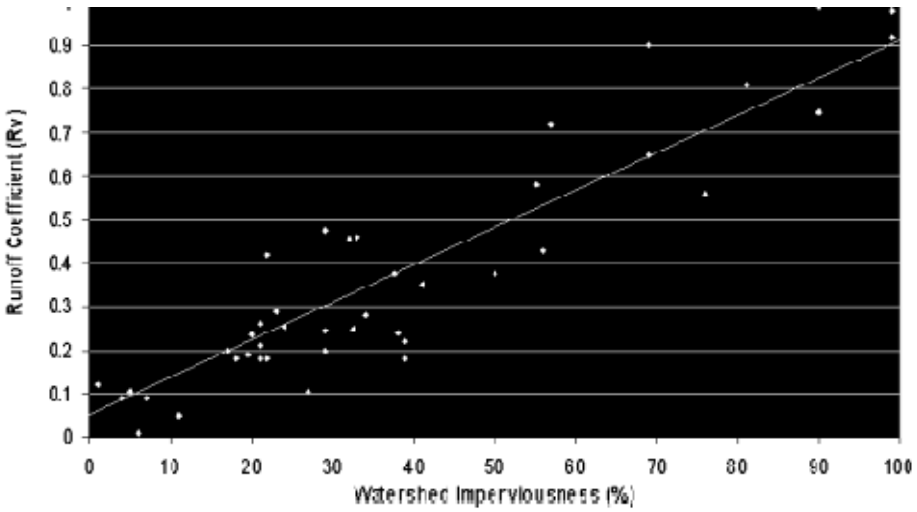
Table A.2 Pollutant Concentrations from Source Areas							
Constituent	**TSS[1]**	**TP[2]**	**TN[3]**	**F Coli[1]**	**Cu[1]**	**Pb[1]**	**Zn[1]**
	mg/l	mg/L	mg/l	1,000 col/ ml	ug/l	ug/l	ug/l
Resid Roof	19	0.11	1.5	0.26	20	21	312
Comm Roof	9	0.14	2.1	1.1	7	17	256
Indust Roof	17	-	-	5.8	62	43	1,390
C/R Parking	27	0.15	1.9	1.8	51	28	139
Indust Parking	228	-	-	2.7	34	85	224
Res Street	172	0.55	1.4	37	25	51	173
Comm Street	468	-	-	12	73	170	450
Rural Highway	51	-	22	-	22	80	80
Urban Highway	142	0.32	3.0	-	54	400	329
Lawns	602	2.1	9.1	24	17	17	50
Landscaping	37	-	-	94	94	29	263
Driveway	173	0.56	2.1	17	17	-	107
Gas Station	31	-	-	-	88	80	290
Auto Recycler	335	-	-	-	103	182	520
Heavy Industrial	124	-	-	-	148	290	1600

1: Claytor and Schueler (1996)

2: Average of Steuer et al. (1997),Bannerman (1993) and Waschbusch (2000)

3: Steuer et al. (1997)

Figure A.1 Relationship Between Watershed Imperviousness and the Stormwater Runoff Coefficient



A.2 Annual Runoff

The Simple Method calculates annual runoff as a product of annual runoff volume, and a runoff coefficient (Rv). Runoff volume is calculated as:

$$\mathbf{R = P * P_j * Rv}$$

Where:
- R = Annual runoff (inches)
- P = Annual rainfall (inches)
- P_j = Fraction of annual rainfall events that produce runoff (usually 0.9)
- Rv = Runoff coefficient

In the Simple Method, the runoff coefficient is calculated based on impervious cover in the subwatershed. This relationship is shown in Figure A.1. Although there is some scatter in the data, watershed imperviousness does appear to be a reasonable predictor of Rv.

The following equation represents the best fit line the dataset (N=47, R^2=0.71).

$$\mathbf{Rv=0.05+0.9Ia}$$

Where: Ia = Impervious fraction

A.3 Impervious Cover Data

The Simple Method uses different impervious cover values for separate land uses within a subwatershed. Representative impervious cover data, are presented in Table A.3. These numbers are derived from a recent study conducted by the Center for Watershed Protection under a grant from the U.S. Environmental Protection Agency to update impervious cover estimates for a variety of land uses. (Cappiella and Brown, 2001). In addition, some jurisdictions may have detailed impervious cover information if they maintain a detailed land use/land cover GIS database.

Table A.3 Land Use and Impervious Cover Estimates

Land Use Category	Mean Impervious Cover
Agriculture	**2**
Open Urban Land*	**9**
2 Acre Lot Residential	**11**
1 Acre Lot Residential	**14**
1/2 Acre Lot Residential	**21**
1/4Acre Lot Residential	**28**
1/8 Acre Lot Residential	**33**
Townhome Residential	**41**
Multifamily Residential	**44**
Institutional**	**31-38%**
Light Industrial	**50-56%**
Commercial	**70-74%**

* Open urban land includes developed park land, recreation areas, golf courses, and cemeteries.

** Institutional is defined as places of worship, schools, hospitals, government offices, and police and fire stations

A.4 Limitations of the Simple Method

The Simple Method should provide reasonable estimates of changes in pollutant export resulting from urban development activities. However, several caveats should be kept in mind when applying this method.

The Simple Method is most appropriate for assessing and comparing the relative stormflow pollutant load changes of different land use and stormwater management scenarios. The Simple Method provides estimates of storm pollutant export that are probably close to the "true" but unknown value for a development site, catchment, or subwatershed. However, it is very important not to over emphasis the precision of the results obtained. For example, it would be inappropriate to use the Simple Method to evaluate relatively similar development scenarios (e.g., 34.3% versus 36.9% Impervious cover). The simple method provides a general planning estimate of likely storm pollutant export from areas at the scale of a development site, catchment or subwatershed. More sophisticated modeling may be needed to analyze larger and more complex drainages.

In addition, the Simple Method only estimates pollutant loads generated during storm events. It does not consider pollutants associated with baseflow volume. Typically, baseflow is negligible or non-existent at the scale of a single development site, and can be safely neglected, unless wastewater sources such as illicit connections and wastewater treatment plans are significant. However, catchments and subwatersheds do generate baseflow volume. Pollutant loads in baseflow are generally low and can seldom be distinguished from natural background levels (NVPDC, 1980). Consequently, baseflow pollutant loads normally constitute only a small fraction of the total pollutant load delivered from an urban area. Nevertheless, it is important to remember that the load estimates refer only to storm event derived loads and should not be confused with the total pollutant load from an area. This is particularly important when the development density of an area is low. For example, in a large low density residential subwatershed (Imp. Cover < 5%), as much as 75% of the annual runoff volume may occur as baseflow. In such a case, the annual baseflow nutrient load may be equivalent to the annual stormflow nutrient load.

A.5 SMP Pollutant Removal

The removal efficiencies of various SMP practices also help determine final annual pollutant loads. Table A.4 provides estimates of the average pollutant removal efficiency of the five SMP categories.

Table A.4. Suggested Removal Rates for SMPs

	TSS	TP	TN	Metals[1]	Bacteria
Wet Ponds	80	50 (51)	35 (33)	60 (62)	70
Stormwater Wetlands	80[2] (76)	50 (49)	30	40 (42)	80 (78)
Filtering Practices	85 (86)	60 (59)	40 (38)	70 (69)	35 (37)
Infiltration Practices [4]	90[3] (95)	70	50 (51)	90[3] (99)	90[4]
Water Quality Swales	85 (84)	40 (39)	50[5] (84)	70	0 (-25)[6]

1. Average of zinc and copper. Only zinc for infiltration
2. Many wetland practices in the database were poorly designed, and we consequently adjusted sediment removal upward.
3. It is assumed that no practice is greater than 90% efficient.
4. Data inferred from sediment removal.
5. Actual data is based on only two highly performing practices.
6. Assume 0 rather than a negative removal.

Note: Data in parentheses represent median pollutant removal data reported in the *National Pollutant Removal Database - Revised Edition* (Winer, 2000). These data were adjusted for convenience and to reflect biases in the data.

These efficiencies represent ideal pollutant removal rates that cannot be achieved at all sites, or at a watershed level. Typically, they need to be "discounted" to account for site constraints, and other factors that reduce practice efficiency. For example, the removal rate should be adjusted to reflect the fraction of runoff captured by a practice on an annual basis (90% if this guidance is followed). For more detail on how to apply these discounts, consult Caraco (2001).

One particularly important consideration is how to account for practices applied in series (e.g., two ponds applied in sequence). If the volume within the practices adds up to the total water quality volume, they are assumed to act as a single practice with that volume. Otherwise, total pollutant removal should be determined by the following equation:

$$R = L\,[(E_1)+(1- E_1)E_2+(1-((E_1)+(1- E_1)E_2)E_3+\ldots]$$

Where:

R = Pollutant Removal (lbs)

L = Annual Load from Simple Method (lbs.)

E_i = Efficiency of the ith practice in a series

Another adjustment can be made to these removals to account for loss of effectiveness and "irreducible concentrations." Evidence suggests that, at low concentrations, SMPs can no longer remove pollutants.

Table A.5 depicts typical outflow concentrations for various SMPs. Another simplified way to account for this phenomenon is to reduce the efficiency of a second or third practice in a series. For example, the removal efficiency could be cut in half to reflect inability to remove fine particles.

Table A.5. Typical SMP Effluent Concentrations

	TSS	TP	TN	Cu	Zn
Wet Ponds	17	0.11	1.3	5.0	30
Wetlands	22	0.20	1.7	7.0	31
Filtering Practices	11	0.10	1.12	10	21
Infiltration Practices	17[2]	0.05[2]	3.8[2]	4.8[2]	39[2]
Open Channel Practices	14	0.19	1.12	10	53

1. Units for Zn and Cu are micrograms per liter
2. Data based on fewer than five data points

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Appendix F
Operations and Maintenance Program Guidance

Using a Self-Certification Process to Streamline Operation & Maintenance (O&M) of Private Stormwater Controls

Purpose and Background

Ongoing maintenance of stormwater controls is essential for those controls to perform as intended to achieve water quality and water quantity benefits. Under the NPDES MS4 Stormwater General Permit for Massachusetts (MS4 Permit), municipalities intending to obtain credit for the phosphorus reductions achieved by stormwater controls (per Appendix F of the MS4 Permit) must ensure that ongoing maintenance is being performed. In accordance with Standard 9 of the Massachusetts Stormwater Handbook [1], municipalities routinely require that applicants for stormwater, wetlands, subdivision, site plan review and special permits provide a stormwater operations and maintenance plan (O&M) in their applications. However, many municipalities find it challenging to ensure ongoing maintenance of stormwater controls occurs after a project is built by an applicant. One solution to this challenge is to require property owners annually self-certify they are inspecting and maintaining their controls. An O&M self-certification process as proposed herein would provide a reporting process that can fold directly into the municipality's MS4 Annual Report and allow the municipality to focus inspections on auditing just a small proportion of the systems each year. Read on to learn how Stormwater O&M self-certification works.

O&M self-certification emerged as an interest and a need during the **Mystic Stormwater Collaborative Project**, which includes the communities of Cambridge, Lexington, Reading, and Watertown, and technical partners such as the Mystic River Watershed Association, University of New Hampshire Stormwater Center, and the U.S. Environmental Protection Agency (EPA). While the four participating communities understand the importance of conducting regular O&M on stormwater management controls, they expressed interest in new ways to address the challenges associated with ensuring O&M on smaller projects within existing regulatory frameworks and available resources.

Model O&M Self-Certification Form

The O&M self-certification form should be simple and easy to complete by a property owner or their agent. A template form that communities can start with is provided in Appendix A.

The minimum information to be collected on a self-certification form should include:

- Name and contact information of owner
- Name and contact information of operator, if applicable
- Address/location of stormwater control
- Type of stormwater control
- Date of last inspection or maintenance for each control
- Certification statement

[1] The Massachusetts Stormwater Handbook is currently being updated. Requirements for the individual stormwater standards may change.

- Signature of owner or operator
- Date attesting to the certification statement
- Reference of the O&M Plan or guidance being followed

Many property owners may be unfamiliar with or unaware of their stormwater controls and maintenance responsibilities. Typically, a stormwater O&M Plan is approved as part of the permitting process for an improvement on their property.

Some projects that fall below a particular municipal permit threshold are often not required to develop a stormwater O&M Plan. For these properties, it may be helpful to append to the self-certification form a menu list of common small-scale stormwater control practices (e.g., dry wells, rain gardens, bio swales, and permeable pavers) along with O&M best practices. This will help serve as a reminder to such owners and their agents (e.g., operators) of the recommended O&M for their specific control(s). An O&M Plan approved through a municipal permit process should always take precedent over the maintenance best practices highlighted in an appendix to the form.

Making Stormwater O&M Plans Readily Available: Most property owners will not be well versed in stormwater controls and may not be aware that the stormwater controls approved on their site require ongoing maintenance. A municipality can help by ensuring that O&M plans approved through a permitting process are complete, include a map or figure identifying each control, and are attached to the permit when it is issued to the property owner. *(Note: Permits should be issued to property owners and linked to specific parcels, even if the applicant filing the permit application is an agent.)*

Depending on the municipality's MS4 regulatory requirements and capacity for data collection, the form could include more specific operational information for the stormwater controls, such as:

- Permit number, so the municipality could track the form back to the original permit.
- A field to indicate whether the stormwater control ties into the MS4.
- Comment box for the owner/operator to describe specific maintenance performed or problems encountered since the last inspection.

Municipalities could require applicants of larger projects, which would be required to submit an O&M Plan with their permit application, to also customize and submit an O&M self-certification form as part of their permit application. The approved customized form could then be used by the owner for years to come.

Regulatory Framework

For this self-certification process to succeed, property owners with stormwater controls must be legally required to submit the stormwater O&M self-certification form each year. This requirement should be embedded into the municipal permitting process either as a standard condition that is attached to the permit approval or found in regulations in the bylaw/ordinance or regulations. This approach will differ among municipalities depending on the existing permit structure for stormwater controls. Regardless of which permitting authority is responsible, the same form should be used and supplemented as needed with any other conditions that may be required by the issuing authority. The permit that includes the ongoing reporting requirement should be issued for a given property and should run with the property.

New Controls: Moving forward, owners/operators of all permitted stormwater controls should be required to submit an annual form certifying completion of the ongoing stormwater O&M Plan approved in their permit.

Existing Controls: Permits for prior permitted stormwater controls should be reviewed to determine if O&M was required and if annual reporting can be required. If O&M was required, the municipality can explore whether and how to include those properties in the self-certification process.

O&M self-certification may be beneficial to municipalities for small, medium, and large projects alike. Larger projects often manage O&M of stormwater controls well since they tend to have better access to resources (e.g., funding, engineers, site managers or operators). However, a municipality may find it useful to require larger projects to self-certify if the community has a significant number of these larger projects to oversee, and limited resources for inspections and enforcement. Smaller projects, on the other hand, may not be as well-informed to properly manage stormwater controls, but self-certification can provide an important educational service to the owners, even if there is no or limited follow-up and enforcement on small projects. Municipalities may find the best use of their resources to target the medium projects, like multi-family housing and mid-size commercial properties.

Consistency in Stormwater Standards Across Permits: If stormwater management controls are evaluated in multiple permit processes (e.g., Stormwater Management Permit, Wetlands Order of Conditions, Site Plan Review, Subdivision Approval, Drainage Connection Permit), those processes should be made consistent so that a given development project and its stormwater controls are held to a uniform set of stormwater standards, including a stormwater O&M Plan.

Submission Frequency

Stormwater O&M self-certification forms should be collected from property owners on an annual basis. Maintaining one uniform submittal schedule, regardless of the installation date or permit issuance date for a given stormwater control, helps to simplify the process for both the property owners/operators and the municipality. The due date for self-certification forms should be selected to provide sufficient time for the municipality to review and compile the results and include them in the municipal MS4 Annual Report.

Submission Process

Completed forms should be directed to a single department or individual to log the responses. The municipality can create a specific email address to receive completed forms, and allow paper copies to be mailed or hand delivered if desired. A municipality that has an online database system in place could create a mechanism for uploading completed forms or ideally an option for completing the form online (there could be a link to a town data base, where the user only has access to his/her submittal field). In the early years, the number of reporting forms collected each year may be minimal. However, over time, it will increase. For this reason, an automated process is recommended.

Auditing and Enforcement

The crux of the self-certification process is auditing. An auditing process involves the municipality performing a small percentage of stormwater inspections each year and is essential to ensuring the credibility of the self-certification reporting. Municipal staff must be authorized through the individual permitting processes or the stormwater ordinance/bylaw to perform inspections and enforce the approved O&M Plan on the applicable properties.

Credible Enforcement Mechanism: Credible enforcement is necessary to ensure MS4 permit holders can obtain phosphorus reduction credit for stormwater controls.

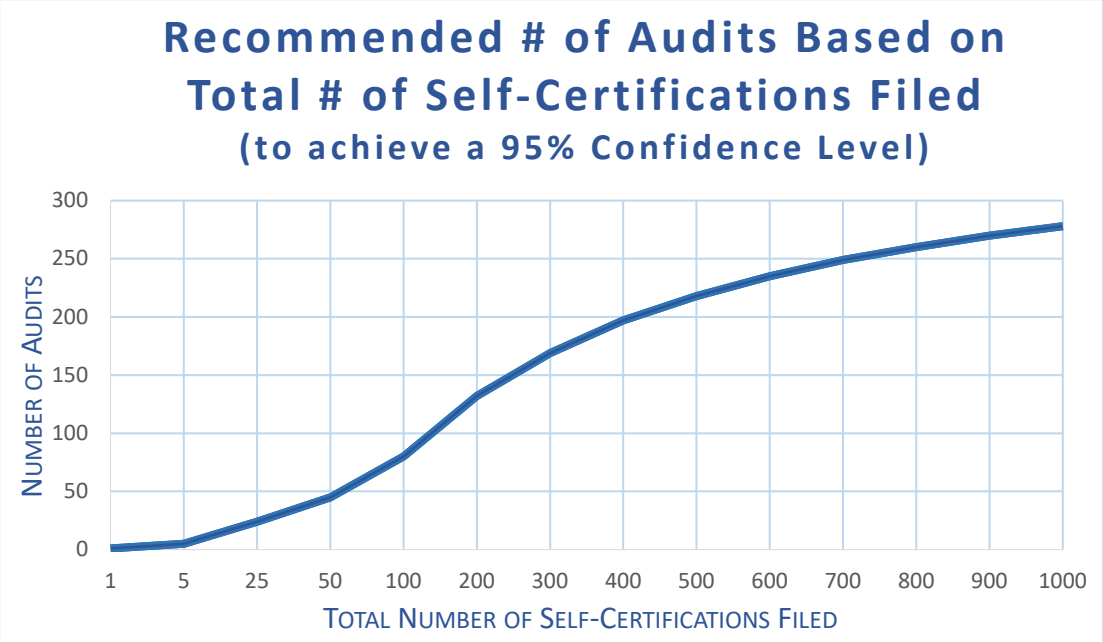
Such authorization for enforcement may currently be provided to different departments, boards, or commissions depending on the permits issued for a given project. It could be beneficial to streamline the auditing and enforcement powers through just one department, such as Engineering, Public Works, or Health, so that the system can be more easily monitored. Many bylaws/ordinances or regulations include a provision by which a board or commission or other permitting entity can designate an agent to perform some of the duties, including enforcement. Review your code for this type of authorization and consider coordinating with other permitting entities to designate one consistent enforcement agent for all stormwater controls.

Although O&M self-certification may be required on projects of variety of sizes, the municipality should focus enforcement resources on medium and large projects. Including small projects in the self-certification process serves as a great educational tool; however, enforcing these types of projects may to be prohibitively burdensome for the municipality.

A properly designed audit program will allow a municipality to maintain confidence that individual self-certified stormwater controls are in fact being maintained. In addition, the MS4 permit requires municipalities to certify that all stormwater controls they are claiming pollution credit for are working and maintained as designed. An important mechanism to ensure that the municipality can make that claim with confidence is a statistically significant auditing program. The community may want to perform a statistical analysis to determine the percentage of audits that should be done each year to ensure general compliance with O&M across all self-certified sites. The box below provides some simple tips for developing an audit to consider for developing an audit program, including some guidance on selecting the number of annual audits to perform based on the total number of controls in the program. The goal is to perform the audits over the course of a 5 year permit cycle.

Tips for Developing an Audit Program:

1. Select the number of audits to perform to ensure with a 95% confidence level that the audited systems will be representative of the total population. If your municipality has fewer than 50 certifications, all of the systems should be audited over the 5-year cycle. As the number of certifications increases, the relative number that needs to be audited decreases.



2. Randomly select the systems to audit (e.g., select every 5th certification in your database).
3. Notify property owners of audits electronically, to let them know when it will be, how long it will take, and to offer to change to a more convenient time if owners want to be present.
4. Develop an audit checklist that mirrors the self-certification standards, so the audit report can be used as an example for self-certification.
5. Communicate the results to the property owner, with a timeline to address deficiencies and a reporting requirement or re-auditing protocol, depending on seriousness of non-compliance
6. At end of the annual or 5-year audit period, tabulate audit data to identify common maintenance issues for further action or revised guidance as needed to improve compliance.

Useful Tool: Permitting Database

A permitting database, from a basic internal Excel file to a GIS database to an online cloud-based system, can be an exceptionally useful tool for communities working to track stormwater controls. A database can help multiple departments within a municipality monitor and participate in the permit approval process, and can serve as an organizational tool to log all permits issued to an individual parcel over time. Important data to track over the long term include permit issuances, parcel ID and up-to-date contact information for parcel owners.

Some communities have instituted an online database to coordinate and track permit applications, reviews, and approvals among municipal departments. The permit information is typically linked to individual parcels allowing a community to track all permits and additional relevant information on a parcel-by-parcel basis. In addition, a permitting database enables the municipality to run reports, compile records, generate electronic communications, and trigger certain reviews or audits on a designated schedule or frequency. In addition, an online permitting database with a public-facing interface can allow permittees to submit documentation to their record, such as an annual stormwater O&M self-certification form. Communities using an online permitting database, such as Viewpoint Cloud, may find it easy to develop and require electronic submission of the O&M self-certification form. Filing these forms electronically will help provide easy access to the forms and critical information required for annual reporting to comply with the MS4 Permit requirements.

Common Online Permitting Platforms:

Viewpoint Cloud (https://www.viewpointcloud.com/). Used in Cambridge and Lexington, MA.
CitizenServe (https://www.citizenserve.com/). Used in Lawrence, MA.
CityView (https://www.municipalsoftware.com/).
Govpilot (https://www.govpilot.com/).

Note: Listing of permit database platforms in this document is for informational purposes only, and does not represent an endorsement by the authors or EPA.

Documenting and Tracking Prior Existing Stormwater Controls

Communities may lack records on the existence and location of small stormwater controls, particularly because stormwater controls could have been approved through one of several different permit processes (e.g., Wetlands Order of Conditions, Site Plan Review, Stormwater Permit, Building Permit). While it would be ideal to know where every stormwater control is located throughout the municipality, a community may only be interested or able to document the type and location of stormwater controls approved and installed in recent years. The MS4 Permit only allows phosphorus control credit for practices if an inspection is performed and any necessary maintenance is performed to bring the system into working order. Therefore, the process of folding these prior existing stormwater controls into the reporting process is useful for the overall health of the watershed in which they are located, but need not be prioritized over tracking and maintenance of new practices.

Communicating with Property Owners

It is best practice to issue reminders to owners/operators to conduct O&M as part of completing the self-certification form. Reminders could be easiest sent via the online permitting database, if applicable. Communities that do not have an online database could send annual reminders to permittees through regular mail and include reminders in other general municipal communications such as social media, town website, or utility billing. Educational materials that are used to promote O&M to smaller projects should be careful to not include a punitive tone if the municipality does not intend to audit and enforce O&M self-certification for small projects.

Ensuring continuity of O&M practices through property transfer can be challenging. Property transfer is a time when information about municipal requirements for the property, such as O&M self-certification, can get lost. While some municipalities require the transfer of property with larger stormwater controls

to renew an O&M plan, it is more difficult to track for small and medium projects. Municipalities can work with the water department to notify the stormwater authority when there is a change in water meter ownership. Other mechanisms may be readily available to the community if an online database is utilized. Municipalities may choose to adopt a bylaw to ensure continuity.

Under the MS4 Permit, municipalities are required to implement an education and outreach program for their community, including residents, businesses, and institutions, which comprise the targeted audience for O&M self-certification. Communities can use this opportunity to circulate a fact sheet on the importance of on-site stormwater management and conducting regular O&M.

Appendix A: Template O&M Self-Certification Form

Stormwater Control Operation and Maintenance
Annual Self-Certification Form
Calendar Year: _____

Owner (required)	**Operator (if applicable)**
Name:	Name:
Phone:	Phone:
Email address:	Email address:
Street Address of Stormwater Control Location:	
Name and Date of Operations and Maintenance Plan: (Note: If your property received or was a part of property that received any of the permits listed on the back of this form since 2020, your permit included a Stormwater O&M Plan that you should be following. Please see the back of this form for more information.)	

Name/ Type of Stormwater Control	**Description and Date of Maintenance performed since July 1 of last year**

Certification Statement

I understand that I own a stormwater control practice or practices on my property and I understand that I need to perform regular and ongoing maintenance of that/those practice(s) to ensure performance and functionality, and to protect the water resources in my community. I certify that I have performed the approved maintenance for my stormwater control practice(s) for this year.

Signature of Owner or Operator: _____

Date: _____

Note: The Town/City performs maintenance audits each year on a small percentage of stormwater controls. You may be contacted by the Department of Public Works for this purpose.

Stormwater Control Operation and Maintenance
Annual Self-Certification Form
ADDENDUM

(This addendum is intended to serve as a reference for property owners in completing the Annual Self-Certification Form. It should be edited by each municipality to meet its own needs)

These are the types of land development or land alteration permits that may include Stormwater O&M Plans for your stormwater practices:

- Stormwater Management Permit
- Wetlands Order of Conditions
- Site Plan Review
- Subdivision Approval
- Drainage Connection Permit

This list of permits should be adjusted by each individual municipality according to its own permit practices.

Our records show that you received a ***[permit type]*** on ***[date].*** Please contact the ***[appropriate department]*** at ***[municipality name]*** Town Offices for help in locating the appropriate Stormwater O&M Plan for your property.

If a database is used to track permits and communicate with permittees, a statement like this could be included on each individual self-certification reporting form that is generated for each permitted property.

Appendix B. Maintenance Needs for Common Small Stormwater Controls for Small Projects

The information summarized below is for stormwater controls that have no approved Operations and Maintenance (O&M) Plan associated with it. Approved O&M Plans take precedent over the information provided below.

Stormwater Controls	Maintenance Summary
Bioretention	**Regularly:** Inspect your bioretention practice, remove trash and debris, pull weeds, and repair any erosion gullies. **Early Spring and Fall:** Mow grassy areas of the practice and prune your plants, remove dead vegetation and replace if needed, and replenish mulch in the bed as needed. **If the practice is slow to drain:** you may need to aerate the top layer of soil or remove fine sediment that may have accumulated. Check the underdrain system through the cleanout to make sure there isn't standing water in the pipe.
Dry Well	**Early Spring and Fall:** inspect the downspout connection to the dry well to be sure it is properly connected and clear of debris. For open downspouts, remove debris and sediment buildup in the upper gravel layer. **If system appears clogged:** If excessive ponding or gully erosion is observed, and/or the system does not drain within three days, your dry well is not functioning properly. Check the drainage connection and gravel for clogging. Remove and replace all stone if needed, or possibly the entire drywell structure if crushed or otherwise damaged beyond repair.
Infiltration Trench	**Early Spring and Fall, and after major storms:** Inspect the system surface for damage and remove accumulated debris and sediment from the upper layer of gravel. Check the underdrain system through the cleanout to make sure there isn't standing water in the pipe, if the practice has an underdrain system. **Annually:** Inspect system and remove sediments, trash and debris from sediment removal (pretreatment) systems when ½ of the storage volume is full of sediment. **If the trench is not draining:** remove and replace the top layer of stone and filter fabric. If ponding continues, gravel layers and pipes may need to be replaced but this usually does not occur until years of use with proper maintenance.
Permeable Pavers	**Monthly:** Remove debris and trash and sweep away sediment buildup that can clog the system over time. **Early Spring and Fall:** Mow and seed the grass in the pavers. Add sand or gravel to stone pavers to replace any lost material. **Winter:** Attach rollers to the bottoms of snowplows to prevent snagging, or perform snow removal with a snowblower or shovel. **After any major storms:** Check that paver system is draining. If it is not, remove and wash gravel in joints, and remove any plant growth that was not originally planted. Refer to manufacturer's instructions for pressure washing or vacuuming.

Stormwater Controls	Maintenance Summary
Planters	**Early Spring:** Inspect the planter and replace any dead or damaged plants, missing gravel, damaged infrastructure and repair any damage to the planter, especially to address leakage. **As needed:** remove debris, trash and sediment that accumulates in the planter.
Porous Pavement	**Routinely:** Remove trash and debris (particularly leaves) from the surface. **Start of each season:** Vacuum sweep (you will need to contract this service, as this requires special equipment) **Annually:** Inspect the surface for deterioration and crumbling and take note of any surface ponding. Repair/replace when needed. **Note:** Do not use sand on porous pavement for winter snow management. Porous pavement helps to significantly reduce standing water, which reduces icing and the need for sand or salt. Sand will clog the system. Salt can be used sparingly in most areas.
Rain Garden	**Regularly:** Inspect your rain garden and remove trash and debris, pull weeds, and repair any erosion gullies. **Early Spring and Fall:** Mow or prune your plants, remove dead vegetation and replace if needed, and mulch the bed. **If the rain garden is slow to drain**: you may need to aerate the top layer of soil or remove fine sediment that may have accumulated.
Water Quality Swale	**Spring and fall:** Mow the swale and remove any accumulated trash and debris. **Annually:** inspect for accumulated sediment and/or erosion; remove sediment and repair gullies as needed. **If draining poorly:** roto-till the bottom of the swale to improve aeration and reseed as needed.

[1] Some stormwater controls, including underground storage, are more advanced or more difficult to access than others and need an experienced operator to routinely inspect and conduct maintenance.

Appendix G
Retrofit Criteria for Priority Ranking of BMPs

Bellingham Retrofit Inventory Assessment

TO: Don DiMartino DPW Director
David Ahnert GIS/MS4 Coordinator

FROM: Emily Scerbo, PE, Vice President
Kate Burke, EIT, Staff Engineer

DATE: June 2022, Revised June 2023

Section 2.3.6.d of the United States Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts (referred to herein as "2016 Small MS4 General Permit") requires that the Town:

> *…identify a minimum of 5 permittee-owned properties that could potentially be modified or retrofitted with BMPs designed to reduce the frequency, volume, and pollutant loads of stormwater discharges to and from its MS4 through the reduction of impervious area. Properties and infrastructure for consideration shall include those with the potential for reduction of on-site impervious area (IA) as well as those that could provide reduction of off-site IA.*
>
> *At a minimum, the permittee shall consider municipal properties with significant impervious cover (including parking lots, buildings, and maintenance yards) that could be modified or retrofitted. MS4 infrastructure to be considered includes existing street right-of-ways, outfalls and conventional stormwater conveyances and controls (including swales and detention practices) that could be readily modified or retrofitted to provide reduction in frequency, volume or pollutant loads of such discharges through reduction of impervious cover.*
>
> *In determining the potential for modifying or retrofitting particular properties, the permittee shall consider factors such as access for maintenance purposes; subsurface geology; depth to water table; proximity to aquifers and subsurface infrastructure including sanitary sewers and septic systems; and opportunities for public use and education.*
>
> *In determining its priority ranking, the permittee shall consider factors such as schedules for planned capital improvements to storm and sanitary sewer infrastructure and paving projects; current storm sewer level of service; and control of discharges to water quality limited waters, first or second order streams, public swimming beaches, drinking water supply sources and shellfish growing areas.*

This memorandum describes the assessment completed for Town-owned properties and infrastructure to determine potential stormwater best management practice (BMP) retrofit opportunities, as well as how the screening and ranking criteria were applied.

Phosphorus Reduction Requirements

The Retrofit Inventory is one part of an overall program that must be established to address post-construction stormwater runoff from all new development and redevelopment sites that disturb one or more acres and discharge into the Town's MS4. Bellingham must also comply with requirements in 2.3.6.a.ii.4 of the 2016 Small MS4 General Permit, which outlines a specific quantity of phosphorus removal required for redevelopment sites that are an acre or larger. Excerpts from Section 2.3.6.a.ii.4 are included herein for reference:

Stormwater management systems on redevelopment sites shall be designed to meet an average annual pollutant removal equivalent to 80% of the average annual postconstruction load of Total Suspended Solids (TSS) related to the total post-construction impervious area on the site AND 50% of the average annual load of Total Phosphorus (TP) related to the total post-construction impervious surface area on the site (based on average annual loading and not on the basis of any individual storm event).

a) Average annual pollutant removal requirements in 2.3.6.a.ii.4 above are achieved through one of the following methods:

1. installing BMPs that meet the pollutant removal percentages…; or

2. retaining the volume of runoff equivalent to, or greater than, 0.8 inch multiplied by the total post-construction impervious surface area on the redeveloped site; or

3. meeting a combination of retention and treatment that achieves the above standards; or

4. utilizing offsite mitigation that meets the above standards within the same USGS HUC12 as the redevelopment site.

Additionally, the Town must comply with the Charles River Watershed Phosphorus Total Maximum Daily Load (TMDL) Requirements listed in Appendix F Part A.I of the 2016 Small MS4 General Permit, which includes development of a Phosphorus Control Plan (PCP) to ensure that current phosphorus loads from stormwater discharged directly or indirectly via tributaries into the Charles River do not increase.

To account for the needed phosphorus loading reduction required by the 2016 Small MS4 General Permit, Charles River Watershed TMDL and PCP, the Town should try to select a suitable site for a BMP retrofit that is located in a catchment with high phosphorus loading in the Charles River watershed to prioritize nutrient removal from stormwater runoff, and select a BMP type that would achieve a total phosphorus removal sufficient to meet General Permit requirements.

Initial Retrofit Assessment and Preliminary Ranking

Previously, Tighe & Bond used existing assessor's GIS data to develop an inventory of municipal buildings, facilities, parks, and open space as part of the *Good Housekeeping and Pollution Prevention Program for Municipal Operations and Maintenance*. This data was used as a baseline for identifying the Town-owned properties for the retrofit inventory. Tighe & Bond conducted an initial desktop assessment of those Town-owned properties using available GIS data based on EPA's screening criteria summarized at the beginning of this memorandum and as described in **Attachment A**. There were 159 Town-owned parcels identified in the initial GIS desktop analysis. Existing total phosphorus loading in pounds per year for each Town-owned parcel was also calculated as described in **Attachment A**.

The Town had partnered with the Charles River Watershed Association (CRWA) and Nitsch Engineering, Inc. to develop a *Subwatershed Management Plan*, which was completed in 2011. The Plan included the identification of priority BMP areas with types of feasible BMP designs. These top areas with suggested BMP designs included:

- Bellingham Plaza: infiltration trenches, rain gardens
- Toni and Jamie Drive cul-de-sac: retrofit detention pond to infiltration basin

- Municipal Building & parking lot: infiltration trench, rain garden, infiltration basins
- Thayer Street Creek Central: infiltration basin
- Town Commons: infiltration basin, rain garden, bioretention system

Parcels that fell within any of these previously noted priority areas were considered during the retrofit assessment.

A preliminary ranking was then determined for each parcel to develop the Initial Retrofit Inventory and determine the feasibility of retrofitting properties with a BMP. **Attachment A** outlines the criteria used for ranking each property and cut-off values associated with each parameter assessed.

Final Retrofit Inventory

Town staff provided input on potential retrofit opportunities throughout Town and planned capital projects (e.g., planned construction of municipal buildings, recently completed and planned capital projects and infrastructure improvement projects). Tighe & Bond incorporated feedback received to update the initial inventory. Ranking criteria is summarized in the table presented in **Attachment B** for the 20 top-ranked sites used to finalize the Retrofit Inventory. During the Permit term, the Town has proactively completed installation of new BMPs to treat stormwater runoff; these parcels were noted as "Complete" in the inventory in **Attachment B**.

The top 5 sites that could next be retrofitted or modified with BMPs are presented in **Table 1**. A map with the locations of these top sites and the location of the Charles River watershed is included in **Attachment C**.

Table 1: Retrofit Inventory Summary

Property	Notes	Priority Rank
Old Town Well (South Main Street)	Basin constructed to treat runoff from South Main Street from Potter Drive to the Town Center.	
Demolished mill building (26 Pearl Street)	Restore the site's existing basin to its full potential to provide the opportunity to remove phosphorus loading.	1
Across from Arrowhead Road (0 Hartford Avenue[1])	Basin to be constructed as part of roadway improvement project.	2
Town Open Space (0 Depot Street)	Opportunity for multiple BMPs, parcel is a large area disjointed along Depot Street	3, 4
Municipal Center Complex (2 & 10 Mechanic Street)	Upcoming construction for road entrance to Town Hall may provide opportunity for retrofit.	5

[1] Parcel incorrectly listed in Permit Year 4 Annual Report as 292 Hartford Avenue.

Note that Tighe & Bond did not complete site visits, subsurface soil, bedrock, or groundwater investigations as part of this retrofit assessment. The Town should complete these investigations as part of the design phase of any selected retrofit site to better determine the actual site conditions at each property. Results of these investigations may alter pollutant removal potential depending on the area available for BMPs, soil conditions, depth to restrictive underground features, and actual land area that can be directed towards the BMP(s) based on existing topography.

Below is a summary of potential BMP types that could be used in a future retrofit project as well as its estimated total phosphorus removal rate. Refer to the Massachusetts Stormwater Handbook for more information on BMP design and treatment characteristics.

- **Water Quality Units** (for pretreatment): a flow-through structure with a settling or separation unit to remove sediments and other pollutants by swirling or flowing water to separate floatables, such as oils and greases, and coarser sediments. 32% TP removal rate.[1]
- **Water Quality Swale** (for pretreatment): vegetated open channels designed to treat the required water quality volume and to convey runoff without erosion. The vegetation in the swales promotes phosphorus removal. 9% TP removal rate, however it can be used as pretreatment to support longevity of certain stormwater treatment features and/or to transport stormwater runoff to another treatment feature.[2]
- **Sediment Forebay** (for pretreatment): consists of an excavated pit or bermed area with a weir, designed to slow incoming stormwater runoff and facilitating the gravity separation of suspended solids. Insufficient data exists on the removal rate for TP; however, it is recommended as pretreatment to support longevity of certain stormwater treatment features, including many of the BMPs recommended in the Final Retrofit Inventory.
- **Porous Pavement**: a paved surface with a higher-than-normal percentage of air voids to allow water to pass through it and infiltrate into the subsoil. It replaces traditional pavement, allowing runoff to receive water quality treatment. All permeable paving systems consist of a durable, load bearing, pervious surface overlying a stone bed that stores rainwater before it infiltrates into the underlying soil. Permeable paving techniques include porous asphalt, pervious concrete, paving stones, and manufactured "grass pavers" made of concrete or plastic. 65% TP removal rate.[3]
- **Bioretention Areas** (otherwise known as a rain garden): a technique that uses soils, plants, and microbes to treat stormwater before it is infiltrated and/or discharged. A bioretention area typically consists of a vegetated depression and subsurface soil media which acts as a filter. 70-83% TP removal rate.[4]
- **Infiltration Basin**: stormwater runoff impoundments that are constructed over permeable soils. Runoff is stored within the basin until it exfiltrates through the soil of the basin floor. 82% TP removal rate.[5]

Next Steps

The Town should review and update the Retrofit Inventory annually by identifying additional sites or infrastructure that could be retrofitted. A minimum of five sites must be maintained in the Retrofit Inventory until such a time as when the Town has less than five possible retrofit sites remaining. In addition, the Town must report on all properties included in the Retrofit Inventory that have been modified or retrofitted with BMPs to mitigate IA. The Town may also include in its annual report non-MS4 owned property that has been modified or retrofitted with BMPs to mitigate IA.

[1] Source: Imbrium Stormceptor STC Performance Test Results from Field Monitoring in Como Park, MN
[2] Source: EPA Storm Water Technology Fact Sheet for Vegetated Swales, dated September 1999
[3] Source: EPA Storm Water Technology Fact Sheet for Porous Pavement, dated September 1999
[4] Source: EPA Storm Water Technology Fact Sheet for Bioretention, dated September 1999
[5] Source: US EPA Region 1 BMP Optimization Tool for Stormwater Management, last updated December 31, 2016

Attachments

Attachment A: Methodology for Retrofit Assessment

Attachment B: Summary of Parcel Evaluation Ranking

Attachment C: Map of Top Retrofit Sites

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Attachment A – Methodology for Retrofit Assessment

This attachment provides the GIS methodology used to identify the top retrofit opportunities within the Town. All actions described were performed in ArcGIS and Microsoft Excel.

Town-owned parcels were assessed for retrofit opportunities and restrictions. Both the 2021 MassGIS Property Tax Parcel layer and the Town Municipal Facility Inventory from the Town's Operation and Maintenance Plan were used to develop an initial list of potential Town-owned properties.

Properties were assessed according to the following GIS layers, where applicable, as listed in **Table 1**. **Table 1** also provides the data sources from which the layers were brought into GIS.

TABLE 1

Shapefiles Used in Retrofit Analysis

Layer	Use	Origin
Property Tax Parcels	Town-owned property determination and total parcel areas	MassGIS
2016 Land Use/Land Cover	Impervious area calculations by parcel	MassGIS
Subsurface Geology	Soil hydrologic group	NRCS Soils Layer
National Wetland Inventory	Wetland areas	MassGIS
MassDEP Hydrography	Stream proximities	MassGIS
FEMA National Flood Hazard Layer	Flood zone proximities	MassGIS
Aquifers	Aquifer proximities	MassGIS
2000 and 2010 Urbanized Areas	MS4 urbanized area proximity	MassGIS
Subsurface Infrastructure	Sewer infrastructure on site	Town database as available
Stormwater Infrastructure	Stormwater infrastructure on site or in proximity	Town database as available
Environmental Justice Area	Environmental Justice areas in proximity	MassGIS
Integrated List of Waters	Impaired water proximity	MassGIS
Shellfish Growing Areas [a]	N/A	N/A
Public Beaches	Public beach proximity	MassGIS
Public Water Supply Source	Public water supply proximity	MassGIS
Wellhead protection area [a]	N/A	N/A
Water supply protection area [a]	N/A	N/A
Watershed Delineations	Within Charles River Watershed	MassGIS

[a] Not located within the Town.

One layer, including all Town-owned parcels of interest, was populated with the information identified in the "use" column of **Table 1**. The following geoprocessing tools were used to populate this information:

- **Summarize Within** to calculate areas in acres within a given parcel
  - Wetland Area
  - Impervious Cover/Area
- **Near** to calculate the proximity of each parcel to the layers of interest
  - FEMA National Flood Hazard Layer
  - Subsurface Infrastructure
  - Aquifers
  - MassDEP Hydrography
  - Integrated List of Waters
  - Public Water Supply Source
  - Public Beaches
- **Intersect** to calculate if a parcel within the layer of interest
  - MS4 urbanized area
  - Stormwater Infrastructure – outfalls on site
  - Stormwater infrastructure – BMP on site
  - Environmental Justice Area
  - Watershed Delineations
- **Calculate Geometry** to calculate the total parcel area
- **Spatial Join** was used to join all soil hydrologic groups present on a given parcel
- Dominant soil type based on the soil type with the greatest area within a given parcel was also calculated using the steps below:
  - **Intersect** soils and parcels
  - **Calculate Geometry** of the area for each of the resulting intersected features
  - **Summarize** table based on max area and classify by parcel
  - **Join** summarized table to intersected table using max area and the calculated area as join IDs
  - **Select by Attribute** to select all features that are NOT null and export values of the dominant soil type, bedrock depth, and water table depth (all attributes in the original soils table)
  - **Join** the dominant soil type, bedrock depth, and water table depth to parcel layer using parcel IDs

In addition, potential phosphorus loading was analyzed for each parcel using the Property Tax Parcels layer and the 2016 Land Use/Land Cover data layer. The impervious cover on each parcel was used as a representation of potential phosphorus loading that could be treated by a BMP on-site (i.e., a parcel with more impervious cover will create and transport more pollutant concentrations in runoff than a parcel with less impervious cover). Tighe & Bond did not complete site visits, site investigations, or delineations of BMP catchment areas for each retrofit site. Results of these analyses may alter pollutant removal potential depending on the area available for BMPs, soil conditions, depth to restrictive underground features, and actual land area that can be directed towards the BMP(s) based on existing topography. Actual phosphorus loading that a BMP could treat should be determined during design of any retrofit project.

Phosphorus loading in pounds per year was then calculated in accordance with the following EPA-approved methods:

- *2016 Massachusetts Small MS4 Permit Pollutant Loading Export Rates applied to the 2016 Massachusetts Land Use/Land Cover GIS Dataset*, EPA
- *Phosphorus Control Planning Workshop #1: All About the Loads*, Webinar, Brown & Caldwell, Charles River Watershed Association

Once these analyses were complete, the parcels were numerically ranked in Excel to create a list of 20 priority sites. Following the preliminary ranking, upcoming capital improvement projects were considered and discussions with Town personnel informed the selection of the top priority properties in the Retrofit Inventory. **Table 2** provides the criteria used for ranking and cutoff values used to assign a value of 0 through 5.

TABLE 2
Property Ranking Criteria

Ranking Criteria	Priority Value (0 through 5) Cut-off Values (criteria specific)						Notes
	0	**1**	**2**	**3**	**4**	**5**	**5 = highest priority rank 0 = lowest priority rank**
Area (acres)	-	0	1	2	5	10	Larger parcel size ranks higher
Impervious Area*	-	0	0.25	0.5	0.75	1	Larger cover ranks higher
Dominant Hydrologic Soil Conditions	C, D, or C/D	-	-	A/D, B/D, Null	-	A or B	Soil types range from A - D and can be mixed. Soil types A & B provide best infiltration rates and therefore ranks highest. Soil types C & D rank lowest.
Wetland Area (% Coverage)	100	75	50	25	15	0	Smaller wetlands area ranks higher
FEMA Floodzone	Floodway	-	100 Year Flood	-	500 Year Flood	None	Parcels not in flood zones rank higher
Proximity to Sewer (ft)	-	0	50	100	200	500	Farther ranks higher
Proximity to Aquifer (mi)	-	1	0.75	0.5	0.25	0	Closer ranks higher
Proximity to Streams (ft)	-	0	-	100	-	200	Farther ranks higher
Proximity to Impaired Waterbody (ft)	-	0	-	100	-	200	Farther ranks higher
Proximity to Public Water Supply (mi)	-	0	0.25	0.5	0.75	1	Farther ranks higher
Proximity to Beach (mi)	-	0	0.25	0.5	0.75	1	Farther ranks higher
Drainage On Site	No	-	-	-	-	Yes	Parcels containing Stormwater infrastructure (outfalls) ranks higher
BMP On Site	Yes	-	-	-	-	No	Parcels without existing BMPs on site rank higher
Located within an Environmental Justice Area	No	-	-	-	-	Yes	Pollutant control in environmental justice areas ranks higher
Watershed	Within Blackstone River	-	-	-	-	Within Charles River	Within Charles River watershed ranks higher
Town Priority Site**	No	-	-	-	-	Yes	Parcels with feasibility for projects rank higher
Phosphorus Load Present on Parcel	-	0	0.5	1	2	5	Higher loading ranks higher
					Max Score:	**120**	

* Note: The priority values for impervious area are weighted as follows

Acres	Priority Value
0	1
0.25	5
0.5	10
0.75	15
1	20

** Note: The priority values for town priority sites are weighted as follows

Town Priority Site	Priority Value
Yes	25
No	0

ATTACHMENT B - SUMMARY OF PARCEL EVALUATION RANKING

Tighe&Bond

Map Parcel ID	Location ID	Site Address	Description	PY4 Annual Report Rank	PY5 Annual Report Rank	Area (acres)	Impervious Area (acres)	Soils (Hydrologic Group)	Wetland Area (% of parcel)	Within FEMA Zone	Proximity to Sewer (ft)	Proximity to Aquifer (miles)	Proximity to Streams (ft)	Proximity to Impaired Water (ft)	Proximity to Public Water Supplies (miles)	Proximity to Public Beach (miles)	Contains Outfall	Contains WQ Structure	Located within an Environmental Justice Area	Located within the Charles River watershed	Town Priority Site	Phosphorus Load Present on Parcel Load	Sum	Estimated Phosphorus Load on Parcel (lb/yr)*
Completed/In Construction Projects																								
0050-0018-0000	F_663245_2855525	0 SOUTH MAIN ST	Old Town Well	**1**	Basin constructed treating runoff from South Main Street from Potter Drive to the Town Center. Included in priority area of 2011 Subwatershed Management Plan.																			
Priority List																								
0004-0060-0000	F_671494_2873422	26 PEARL ST	Demolished mill building with existing basin that provides opportunity for restoration.	**2**	**1**	5	20	5	4	2	5	3	1	1	5	5	0	0	0	0	25	4	85	2.4
0024-0020-0000	F_663068_2865769	0 HARTFORD AV	(*Incorrectly listed in PY4 Annual Report as 292 Hartford Ave*). Basin to be constructed as part of road project.	**3**	**2**	5	20	5	3	4	1	4	1	5	3	5	0	5	0	5	25	4	95	2.5
0038-0023-0000	F_658503_2861927	0 DEPOT ST	Land gifted to the Town summer 2022. Parcel disjointed (includes Parcel 0033-0002-000). Potential for ≥1 BMP.	**4, 5**	**3, 4**	5	20	5	5	4	5	5	1	5	2	5	0	5	0	5	25	5	102	8.8
0045-0054-0000	F_663222_2856774	2 & 10 MECHANIC ST	Municipal Center Complex: Upcoming construction for road entrance to Town Hall may provide opportunity for retrofit. Included in priority area of 2011 Subwatershed Management Plan.	-	**5**	5	20	3	5	5	1	5	1	5	5	5	5	5	0	0	25	4	99	2.2
0060-0007-0000	F_665007_2852183	28 BLACKSTONE ST	Council on Aging & DPW & Fire Dept & Police Dept	-	-	5	20	5	5	5	1	5	5	5	5	4	5	5	0	5	0	5	85	11.9
0086-0042-0000	F_659234_2837618	70 HARPIN ST	Keough Memorial Academy and South Elementary School	-	-	5	20	5	5	5	4	5	1	5	2	5	5	5	0	5	0	5	82	5.9
0050-0017-0000	F_662228_2854943	1158 SOUTH MAIN ST	Potter Drive Sewer Pump Station	-	-	5	20	0	5	5	1	4	1	5	5	5	5	5	0	5	0	4	75	3.8
0060-0008-0000	F_663555_2852191	130 BLACKSTONE ST	Public Library & Memorial Middle School, George T. Anderson Field, and Garage. New basin constructed 2022.	-	-	5	20	5	5	5	1	4	5	5	5	4	0	0	0	5	0	2	71	1.0
0044-0028-0000	F_662436_2857192	15 MENDON ST	Bellingham Town Common Included in priority area of 2011 Subwatershed	-	-	4	15	5	5	5	1	4	5	5	4	5	5	5	0	0	0	2	70	0.9
0089-013C-0000	F_666549_2839123	0 PULASKI BV	Open space, wooded, west of Denault Drive	-	-	5	1	3	3	4	5	5	5	5	4	5	5	5	0	5	0	4	64	2.2
0058-0001-0000	F_658722_2852223	0 NORTH ST	Open space, wooded, north of North Street & Linda Way	-	-	5	1	5	5	5	5	5	5	5	5	5	0	5	0	5	0	3	64	2.0
0013-010C-0000	F_667197_2870031	342 HARTFORD AV	Stall Brook Elementary School	-	-	5	20	5	5	2	1	5	1	5	1	5	0	5	0	0	0	4	64	2.7
0053-0003-0000	F_659663_2853224	0 BLACKSTONE ST	Blackstone Street Conservation Area	-	-	5	1	5	5	5	5	5	3	5	5	5	0	5	0	5	0	4	63	2.4
0016-0011-0000	F_657641_2867044	113 GROVE ST	Water Tower-Grove St (Standpipe 3)	-	-	2	5	5	5	5	5	4	5	5	5	5	0	5	0	5	0	1	62	0.1
0098-110A-0000	F_657747_2831385	0 DEWEY ST	Open space, wooded, at state line, south of California Avenue	-	-	1	1	5	5	5	5	5	5	5	4	5	0	5	5	5	0	1	62	0.0
0040-0019-0000	F_664649_2858943	33 HIGH ST	High Street Complex (Ball Fields)	-	-	5	15	5	4	2	1	5	1	1	3	5	5	5	0	0	0	5	62	6.4
0081-0003-0000	F_668254_2842323	0 LAKE ST	Open space, wooded, between Highridge Road & Cypress Lane	-	-	5	1	5	5	5	5	5	5	5	3	4	0	5	0	5	0	3	61	1.4
0072-0025-0000	F_665860_2848506	100 CROSS ST	Silver Lake Park	-	-	5	20	3	5	2	3	5	1	1	2	1	0	5	0	5	0	3	61	1.6
0048-0003-0000	F_656988_2854940	0 BROOK ST	Open space, wooded	-	-	5	1	5	5	4	5	5	1	5	5	5	0	5	0	5	0	5	61	23.9

**Phosphorus loads were calculated per parcel for estimating purposes. Actual Phosphorus loads to a potential BMP will be calculated during design. Methods based on Brown & Caldwell, Charles River Watershed Association "Phosphorus Control Planning Workshop #1: All About the Loads: Baseline Loads" webinar and EPA's "2016 Massachusetts Small MS4 Permit Pollutant Loading Export Rates applied to the 2016 Massachusetts Land Use/Land Cover GIS Dataset"*

MEDWAY

MILFORD

HOPEDALE

MENDON

FRANKLIN

BLACKSTONE

Parcel ID: 0004-0060-0000
Address: 26 Pearl Street

Parcel ID: 0024-0020-0000
Address: 0 Hartford Avenue

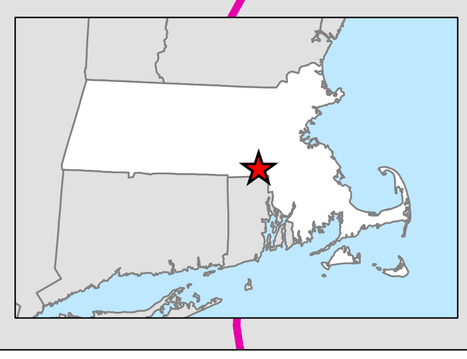
Parcel IDs: 0038-0023-0000
& 0033-0002-0000
Address: 0 Depot Street

Parcel ID: 0045-0054-0000
Address: 2 & 10 Mechanic Street

Parcel ID: 0050-0018-0000
Address: 0 South Main Street

Charles River Watershed

Blackstone River Watershed



Legend

- Stream/Intermittent Stream
- MS4 Urban Area (2000 and 2010)
- Town Boundary
- Parcel Boundary
- Major Drainage Basin
- Lake, Pond, River or Impoundment
- Inland Wetlands
- Top 5 Parcels
- Completed Project

1:12,500

0 1,500 3,000

Feet

ATTACHMENT C

POTENTIAL RETROFIT SITES BELLINGHAM, MASSACHUSETTS

February 2024

Tighe&Bond

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Appendix H
Supporting Calculations for Implementation Cost

STANDARD OPERATING PROCEDURE

Structural Stormwater Best Management Practices Inspections & Maintenance

TARGETED POLLUTANTS

MASSACHUSETTS STORMWATER HANDBOOK (VOLUME 2, CHAPTER 2):

https://www.mass.gov/doc/massachusetts-stormwater-handbook-vol-2-ch-2-stormwater-best-management-practices/download

Description

Procedures for inspecting and maintaining common types of constructed stormwater best management practices (BMPs). Constructed BMPs are permanent site features designed to retain, treat, and/or infiltrate stormwater before discharging it to a surface waterbody.

In accordance with Part 2.3.7.a.iii.6 of the MS4 General Permit, all municipally-owned stormwater treatment structures (excluding catch basins) shall be inspected annually, at a minimum. The description of each BMP type and the recommended activities for inspection and maintenance are based on the Massachusetts Stormwater Handbook (February 2008) and should be considered guidelines to follow, but the maintenance schedules presented herein are more prescriptive and stringent than the MS4 General Permit and will be followed on a case-by-case basis. **The Town will complete the required inspection annually and compmlete maintenance on an as-needed basis.**

This SOP is not intended to replace a site-specific Operation and Maintenance (O&M) Plan required by the Massachusetts Wetlands Protection Act Order of Conditions or a local stormwater requirement.

While many of the BMP types listed in this SOP can be found in the Town, information for additional BMP types is also included in case they are constructed in the future. A general inspection form is attached.

In accordance with General Permit requirements, the Town must keep a written record (hard copy or electronic) of all maintenance activities and inspections completed and report on the status each year in the Annual Report. Maintain records for a period of at least five years.

Note: Information related to catch basins is provided in a separate SOP. Also, BMP accessories (e.g., level spreaders, check dams, outlet structures, and catch basin inserts) are not formally described in this SOP. Maintenance of BMP accessories generally includes regular inspections (especially after large rainfall events and per the manufacturer's recommendation), noting and repairing any erosion or damage as needed, removing sediment as needed, and lawfully disposing of any cleanings or used filtration media.

Structural Pretreatment BMPs

Oil and Grit Separators

Description

Oil/grit separators are underground storage tanks with three chambers designed to remove heavy particulates, floating debris and hydrocarbons from stormwater. Stormwater enters the first chamber where heavy sediments and solids drop out. The flow moves into the second chamber where oils and greases are removed and further settling of suspended solids takes place. Oil and grease are stored in this second chamber for future removal. After moving into the third outlet chamber, the clarified stormwater runoff is then discharged to a pipe and another BMP. There are other separators that may be used for spill control.

Inspection & Maintenance

Sediments and associated pollutants and trash are removed only when inlets or sumps are cleaned out, so regular maintenance is essential. Most studies have linked the failure of oil grit separators to the lack of regular maintenance. The more frequent the cleaning, the less likely sediments will be resuspended and subsequently discharged.

In addition, frequent cleaning also makes more volume available for future storms and enhances overall performance. Cleaning includes removal of accumulated oil and grease and sediment using a vacuum truck or other ordinary catch basin cleaning device. In areas of high sediment loading, inspect and clean inlets after every major storm. At a minimum, inspect oil grit separators monthly, and clean them out at least twice per year. Polluted water or sediments removed from an oil grit separator should be disposed of in accordance with all applicable local, state and federal laws and regulations including M.G.L.c. 21C and 310 CMR 30.00.

Recommended Maintenance Schedule

Activity	Frequency
Inspect units	After every major storm but at least monthly
Clean units	Twice a year

Sediment Forebays

Description

A sediment forebay is a post-construction practice consisting of an excavated pit, bermed area, or cast structure combined with a weir, designed to slow incoming stormwater runoff and facilitating the gravity separation of suspended solids. This practice is different from a sediment trap used as a construction period BMP.

Inspection & Maintenance

Regular maintenance is critical for filter strips to be effective and to ensure that flow does not shortcircuit the system. Conduct semi-annual inspections during the first year (and annually thereafter). Inspect the level spreader for sediment buildup and the vegetation for signs of erosion, bare spots, and overall health. Regular, frequent mowing of the grass is required. Remove sediment from the toe of slope or level spreader, and reseed bare spots as necessary. Periodically, remove sediment that accumulates near the top of the strip to maintain the appropriate slope and prevent formation of a “berm” that could impede the distribution of runoff as sheet flow. When the filter strip is located in the buffer zone to a wetland resource area, the operation and maintenance plan must include strict measures to ensure that maintenance operations do not alter the wetland resource areas. Please note, filter strips are restricted to the outer 50 feet of the buffer zone.

Recommended Maintenance Schedule

Activity	Frequency
Inspect sediment forebays	Monthly
Clean sediment forebays	Four times per year and when sediment depth is between 3 to 6 feet.

Vegetated Filter Strips

Description

Vegetated filter strips, also known as filter strips, grass buffer strips and grass filters, are uniformly graded vegetated surfaces (i.e., grass or close-growing native vegetation) that receive runoff from adjacent impervious areas. Vegetated filter strips typically treat sheet flow or small concentrated flows that can be distributed along the width of the strip using a level spreader. Vegetated filter strips are designed to slow runoff velocities, trap sediment, and promote infiltration, thereby reducing runoff volumes.

Inspection & Maintenance

Sediments and associated pollutants are removed only when sediment forebays are actually cleaned out, so regular maintenance is essential. Frequently removing accumulated sediments will make it less likely that sediments will be resuspended. At a minimum, inspect sediment forebays monthly and clean them out at least four times per year. Stabilize the floor and sidewalls of the sediment forebay before making it operational, otherwise the practice will discharge excess amounts of suspended sediments. When mowing grasses, keep the grass height no greater than 6 inches. Set mower blades no lower than 3 to 4 inches. Check for signs of rilling and gullying and repair as needed. After removing the sediment, replace any vegetation damaged during the clean-out by either reseeding or resodding. When reseeding, incorporate practices such as hydroseeding with a tackifier, blanket, or similar practice to ensure that no scour occurs in the forebay, while the seeds germinate and develop roots.

Recommended Maintenance Schedule

Activity	Frequency
Inspect the level spreader for sediment buildup and the vegetation for signs of erosion, bare spots, and overall health.	Every six months during the first year. Annually thereafter.
Regularly mow the grass.	As needed
Remove sediment from the toe of slope or level spreader and reseed bare spots.	As needed

Treatment BMPs

Bioretention Areas and Rain Gardens

Description

Bioretention areas and rain gardens are shallow depressions filled with sandy soil, topped with a thick layer of mulch and planted with dense native vegetation. There are two types of bioretention cells:

1. Filtering bioretention area: Areas that are designed solely as an organic filter; and
2. Exfiltration bioretention area: Areas that are configured to recharge groundwater in addition to acting as a filter.

Inspection & Maintenance

Regular inspection and maintenance are important to prevent against premature failure of bioretention areas or rain gardens. Regular inspection and maintenance of pretreatment devices and bioretention cells for sediment buildup, structural damage and standing water can extend the life of the soil media.

When failure is discovered, excavate the bioretention area, scarify the bottom and sides, replace the filter fabric and soil, replant vegetation and mulch the surface.

Never store snow within a bioretention area or rain garden. This would prevent required water quality treatment and the recharge of groundwater.

Recommended Maintenance Schedule

Activity	Time of Year	Frequency
Inspect for soil erosion and repair	Year round	Monthly
Inspect for invasive species and remove if present	Year round	Monthly
Remove trash	Year round	Monthly
Mulch Void Areas	Spring	Annually
Remove dead vegetation	Fall and Spring	Bi-Annually
Replace dead vegetation	Spring	Annually
Prune	Spring or Fall	Annually
Replace all media and vegetation	Late Spring/Early Summer	As Needed

Bioretention/Constructed Stormwater Wetlands

Description

Constructed stormwater wetlands maximize the pollutant removal from stormwater through the use of wetland vegetation uptake, retention and settling. Constructed storm water wetlands must be used in conjunction with other BMPs, such as sediment forebays.

Inspection & Maintenance

Regular inspection and maintenance are important for the health of constructed stormwater wetlands. Regular inspection and maintenance of pretreatment devices, such as forebays, should check for sediment buildup, structural damage and standing water. Inspection of the constructed wetlands should address the health of the vegetation,

presence of invasive species, and identify the need to replace vegetation or media. Never store snow within a constructed stormwater wetland, as this would prevent required water quality treatment and the recharge of groundwater.

When failure is discovered, excavate the bioretention area, scarify the bottom and sides, replace the filter fabric and soil, replant vegetation and mulch the surface.

Recommended Maintenance Schedule – Years 0—3

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Year round	Monthly
Record and Map:	Year round	Annually
Types and distribution of dominant wetland plants	Year round	Bi-Annually
Presence and distribution of planted wetland species	Spring	Annually
Presence and distribution of invasive species	Fall and Spring	Bi-Annually
Indications other species are replacing planted wetland species	Spring	Annually
Percent of standing water that is not vegetated	Spring or Fall	Annually
Replace all media and vegetation	Late Spring/Early Summer	As Needed
Stability of original depth zones and micro-topographic features	Spring and Fall	Bi-Annually
Accumulation of sediment in the forebay and micropool and survival rate of plants	Spring and Fall	Bi-Annually

Recommended Maintenance Schedule – Years 4+

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Year round	Monthly
Clean forebays	Year round	Annually
Clean sediment in basin/wetland system	Year round	Once every 10 years
Mulch Void Areas	Spring	Annually
Remove dead vegetation	Fall and Spring	Bi-Annually
Replace dead vegetation	Spring	Annually
Prune	Spring or Fall	Annually
Replace all media and vegetation	Late Spring/Early Summer	As Needed

Extended Dry Detention Basins

Description

Extended dry detention basins are designed to control both stormwater quantity and quality. These BMPs are designed to hold stormwater for at least 24 hours, allowing solids to settle and to reduce local and downstream flooding. Pretreatment is required to reduce the potential for overflow clogging. The outflow may be designed as either fixed or adjustable. Additional nutrient removal may be achieved by a micropool or shallow marsh.

Inspection & Maintenance

Annual inspection of extended dry detention basins is required to ensure that the basins are operating properly. Potential problems include: erosion within the basin and banks, tree growth on the embankment, damage to the emergency spillway and sediment accumulation around the outlet. Should any of these problems be encountered, necessary repairs should be made immediately.

Recommended Maintenance Schedule

Activity	Time of Year	Frequency
Inspect basins	Spring and Fall	Bi-Annually, and during and after major storms
Examine outlet structure for clogging or high outflow release velocities	Spring and Fall	Bi-Annually
Mow upper stage, side slopes, embankment and emergency spillway	Spring through Fall	Bi-Annually
Remove trash and debris	Spring	Bi-Annually
Remove sediment from basin	Year round	At least once every 5 years

Sand and Organic Filters

Description

Sand and organic filters, also known as filtration basins, are intended for quality control rather than quantity control. These filters improve water quality by removing pollutants through a filtering media and settling pollutants on top of the sand bed and/or in a pretreatment basin. Pretreatment is required to prevent filter media from clogging. Runoff from the filters is typically discharged to another BMP for additional treatment.

Inspection & Maintenance

If properly maintained, sand and organic filters have a long design life. Maintenance requirements include raking the sand and removing sediment, trash and debris from the surface of the BMP. Over time, fine sediments will penetrate deep into the sand requiring replacement of several inches or the entire sand layer. Discolored sand is an indicator of the presence of fine sediments, suggesting that replacement of the sand should be completed.

Recommended Maintenance Schedule

Activity	Frequency
Inspect filters and remove debris	After every major storm for the first 3 months after construction completion. Every 6 months thereafter.

Wet Basins

Description

Wet basins are intended to treat stormwater quality through the removal of sediments and soluble pollutants. A permanent pool of water allows sediments to settle and removes the soluble pollutants, including some metals and nutrients. Additional dry storage is required to control peak discharges during large storm events, and if properly designed and maintained wet basins can add fire protection, wildlife habitat and aesthetic values to a property.

Inspection & Maintenance

To ensure proper operation, wet basin outfalls should be inspected for evidence of clogging or excessive outfall releases. Potential problems to investigate include erosion within the basin and banks, damage to the emergency spillway, tree growth on the embankment, sediment accumulation around the outlet and the emergence of invasive species. Should any of these problems be encountered, perform repairs immediately. An on-site sediment disposal area will reduce sediment removal costs.

Recommended Maintenance Schedule

Activity	Time of Year	Frequency
Inspect wet basins	Spring and/or Fall	Annually (Minimum)
Mow upper stage, side slopes, embankment and emergency spillway	Spring through Fall	Bi-Annually (Minimum)
Remove sediment, trash and debris	Spring through Fall	Bi-Annually (Minimum)
Remove sediment from basin	Year round	As required, minimum once every 10 years

Conveyance BMPs

Drainage Channels

Description

Drainage channels are traditional vegetated open channels that are designed to provide for non-erosive conveyance. They receive no infiltration or TSS removal credit (Standards 3 and 4).

Inspection & Maintenance

The maintenance and inspection schedule should take into consideration the effectiveness of the drainage channel. Regular maintenance tasks include mowing, fertilizing, liming, watering, pruning, weeding, and pest control. Keep grass height under 6 inches to maintain the design depth necessary to serve as a conveyance. Do not mow excessively, because it may increase the design flow velocity. Remove sediment and debris manually at least once per year. Re-seed periodically to maintain the dense growth of grass vegetation. Take care to protect drainage channels from snow removal procedures and off-street parking. When drainage channels are located on private residential property, the operation and maintenance plan must clearly specify the private property owner who is responsible for carrying out the required maintenance. If the operation and maintenance plan calls for maintenance of drainage channels on private properties to be performed by a public entity or an association (e.g. homeowners association), maintenance easements must be obtained.

Recommended Maintenance Schedule

Activity	Frequency
Inspect channels to make sure vegetation is adequate and for signs of rilling and gullying. Inspect for slope integrity, soil moisture, vegetative health, soil stability, soil compaction, soil erosion, ponding, and sediment accumulation. Repair any rills or gullies. Replace dead vegetation.	The first few months after construction and twice a year thereafter.
Mow	As necessary. Grass height shall not exceed 6 inches.
Remove sediment and debris manually	At least once a year
Reseed	As necessary. Use of road salt or other deicers during the winter will necessitate yearly reseeding in the spring.

Grassed Channels

Description

Grassed Channels (formerly known as Biofilter swales) are treatment systems with a longer hydraulic residence time than drainage channels. The removal mechanisms are sedimentation and gravity separation, rather than filtration. To receive TSS credit, a sediment forebay or equivalent must be provided for pretreatment. Note that the sediment forebay does not receive a separate TSS removal credit.

Inspection & Maintenance

Maintenance access must be designed as part of the grass channel. If located adjacent to a roadway, make the maintenance access at least 15 feet wide, which can also be combined with a breakdown lane along a highway or onstreet parking along a residential street. When combined with on-street parking, post signs prohibiting parking when the swale is to be inspected and cleaned. Do not use travel lanes along highways and streets as the required maintenance access. Set mower blades no lower than 3 to 4 inches above the ground. Do not mow beneath the depth of the design flow during the storm associated with the water quality event (e.g., if the design flow is no more than 4 inches, do not cut the grass shorter than 4 inches). Mow on an as-needed basis during the growing season so that the grass height does not exceed 6 inches. Inspect semi-annually the first year, and at least once a year thereafter. Inspect the grass for growth and the side slopes for signs of erosion and formation of rills and gullies. Plant an alternative grass species if the original grass cover is not successfully established. If grass growth is impaired by winter road salt or other deicer use, re-establish the grass in the spring. Remove accumulated trash and debris prior to mowing. Check on a yearly basis and clean sediment as needed. Use hand methods (i.e., a person with a shovel) when cleaning to minimize disturbance to vegetation and underlying soils. Sediment build-up in the grass channel reduces its capacity to treat and convey the water quality event, 2-year and 10-year 24-hour storm.

Recommended Maintenance Schedule

Activity	Frequency
Remove sediment from forebay	Annually
Remove sediment from grass channel	Annually
Mow	Once a month during growing season
Repair areas of erosion and revegetate	As needed, but no less than once a year

Water Quality Swale

Description

Water quality swales are vegetated open channels designed to treat the required water quality volume and to convey runoff from the 10-year storm without causing erosion. There are two different types of water quality swales that may be used to satisfy the Stormwater Management Standards:

- Dry Swales
- Wet Swales

Unlike drainage channels which are intended to be used only for conveyance, water quality swales and grass channels are designed to treat the required water quality volume and incorporate specific features to enhance their stormwater pollutant removal effectiveness. Water quality swales have higher pollutant removal efficiencies than grass channels.

Inspection & Maintenance

Incorporate a maintenance and inspection schedule into the design to ensure the effectiveness of water quality swales. Inspect swales during the first few months after installation to make sure that the vegetation in the swales becomes adequately established. Thereafter, inspect swales twice a year. During the inspections, check the swales for slope integrity, soil moisture, vegetative health, soil stability, soil compaction, soil erosion, ponding and sedimentation. Regular maintenance includes mowing, fertilizing, liming, watering, pruning, and weed and pest control. Mow swales at least once per year. Do not cut the grass shorter than three to four inches, otherwise the effectiveness of the vegetation in reducing flow velocity and removing pollutants may be reduced. Do not let grass height exceed 6 inches. Manually remove sediment and debris at least once per year, and periodically re-seed, if necessary, to maintain a dense growth of vegetation. Take care to protect water quality swales from snow removal and disposal practices and off-street parking. When grass water quality swales are located on private residential property, the operation and maintenance plan must clearly identify the property owner who is responsible for carrying out the required maintenance. If the operation and maintenance plan calls for maintenance of water quality swales on private properties to be accomplished by a public entity or an association (e.g. homeowners association), maintenance easements must be secured.

Recommended Maintenance Schedule

Activity	Frequency
Inspect swales to make sure vegetation is adequate and slopes are not eroding. Check for rilling and gullying. Repair eroded areas and revegetate	The first few months after construction and twice a year thereafter.
Mow dry swales. Wet swales may not need to be mowed depending on vegetation.	As needed.
Remove sediment and debris manually	At least once a year.
Reseed	As necessary.

Infiltration BMPs

Dry Wells

Description

Dry wells are used to infiltrate uncontaminated runoff. These BMPs should never be used to infiltrate stormwater or runoff that has the potential to be contaminated with sediment and other pollutants. Dry wells provide groundwater recharge and can reduce the size and cost required of downstream BMPs or storm drains. However, they are only applicable in drainage areas of less than one acre and may experience high failure rates due to clogging.

Inspection & Maintenance

Proper dry well function depends on regular inspection. Clogging has the potential to cause high failure rates. The water depth in the observation well should be measured at 24- and 48-hour intervals after a storm and the clearance rate calculated. The clearance rate is calculated by dividing the drop in water level (inches) by the time elapsed (hours).

Recommended Maintenance Schedule

Activity	Frequency
Inspect dry wells	After every major storm for the first 3 months after construction completion. Annually thereafter.

Infiltration Basins

Description

Infiltration basins are designed to contain stormwater quantity and provide groundwater recharge. Pollution prevention and pretreatment are required to ensure that contaminated stormwater is not infiltrated. Infiltration basins reduce local flooding and preserve the natural water balance of the site, however high failure rates often occur due to improper siting, inadequate pretreatment, poor design and lack of maintenance.

Inspection & Maintenance

Regular maintenance is required to prevent clogging, which results in infiltration basin failure. Clogging may be due to upland sediment erosion, excessive soil compaction or low spots.

Inspections should include:

- signs of differential settlement
- cracking
- erosion
- leakage in the embankments
- tree growth on the embankments
- rip-rap condition
- sediment accumulation
- turf health

Recommended Maintenance Schedule

Activity	Time of Year	Frequency
Preventative maintenance	Spring and Fall	Bi-Annually
Inspection	Spring and Fall	After every major storm for the first 3 months after construction completion. Bi-annually thereafter and discharges through the high outlet orifice.
Mow/rake buffer area, side slopes and basin bottom	Spring and Fall	Bi-Annually
Remove trash, debris and organic matter	Spring and Fall	Bi-Annually

Infiltration Trenches

Description

Infiltration trenches are shallow excavations filled with stone. They can be designed to capture sheet flow or piped inflow. The stone provides underground storage for stormwater runoff. The stored runoff gradually exfiltrates through the bottom and/or sides of the trench into the subsoil and eventually into the water table.

Inspection & Maintenance

Because infiltration trenches are prone to failure due to clogging, it is imperative that they be aggressively maintained on a regular schedule. Using pretreatment BMPs will significantly reduce the maintenance requirements for the trench itself. Removing accumulated sediment from a deep sump catch basin or a vegetated filter strip is considerably less difficult and less costly than rehabilitating a trench. Eventually, the infiltration trench will have to be rehabilitated, but regular maintenance will prolong its operational life and delay the day when rehabilitation is needed. With appropriate design and aggressive maintenance, rehabilitation can be delayed for a decade or more. Remove tree seedlings, before they become firmly established. Remove accumulated sediment, trash, debris, leaves and grass clippings from mowing. Check inlet and outlet pipes to determine if they are clogged. If the top of the trench is grassed, it must be mowed on a seasonal basis. Grass height must be maintained to be no more than four inches. Routinely remove grass clippings leaves and accumulated sediment from the surface of the trench. Inspect the trench 24 hours or several days after a rain event, to look for ponded water. If there is ponded water at the surface of the trench, it is likely that the trench surface is clogged. To address surface clogging, remove and replace the topsoil or first layer of stone aggregate and the filter fabric. If water is ponded inside the trench, it may indicate that the bottom of the trench has failed. To rehabilitate a failed trench, all accumulated sediment must be stripped from the bottom, the bottom of the trench must be scarified and tilled to induce infiltration, and all of the stone aggregate and filter fabric or media must be removed and replaced.

Recommended Maintenance Schedule

Activity	Frequency
Preventative maintenance	Twice a year
Inspect units and remove debris	Every 6 months and after every major storm
Remove sediment from pretreatment BMPs	Every 6 months and after every major storm
Inspect and clean pretreatment BMPs	Every 6 months and after every major storm (2 year return frequency)

Subsurface Structures

Description

Subsurface structures are underground systems that capture runoff, and gradually infiltrate it into the groundwater through rock and gravel. There are a number of underground infiltration systems that can be installed to enhance groundwater recharge. The most common types include pre-cast concrete or plastic pits, chambers (manufactured pipes), perforated pipes, and galleys.

Inspection & Maintenance

Because subsurface structures are installed underground, they are extremely difficult to maintain. Remove any debris that might clog the system. Include mosquito controls in the Operation and Maintenance Plan.

Recommended Maintenance Schedule

Activity	Frequency
Inspect inlets	Twice a year
Remove any debris that might clog the system	As needed

Proprietary BMPs

Proprietary Separators

Description

A proprietary separator is a flow-through structure with a settling or separation unit to remove sediments and other pollutants. They typically use the power of swirling or flowing water to separate floatables and coarser sediments, are typically designed and manufactured by private businesses, and come in different sizes to accommodate different design storms and flow conditions. Some rely solely on gravity separation and contain no swirl chamber. Since proprietary separators can be placed in almost any location on a site, they are particularly useful when either site constraints prevent the use of other stormwater techniques or as part of a larger treatment train. The effectiveness of proprietary separators varies greatly by size and design, so make sure that the units are sized correctly for the site's soil conditions and flow profiles, otherwise the unit will not work as designed.

Inspection & Maintenance

Inspect and clean these units in strict accordance with manufacturers' recommendations and requirements. Clean the units using the method specified by the manufacturer. Vactor trucks are typically used to clean these units. Clamshell buckets typically used for cleaning catch basins are almost never allowed by manufacturers. Sometimes it will be necessary to remove sediment manually.

Recommended Maintenance Schedule

Activity	Frequency
Inspect in accordance with manufacturer requirements, but no less than twice a year following installation, and no less than once a year thereafter.	See activity
Remove sediment and other trapped pollutants at frequency or level specified by manufacturer.	Per manufacturer's schedule

Proprietary Media Filters

Description

Media Filters are designed to reduce total suspended solids and other target pollutants, such as organics, heavy metals or nutrients, which are sorbed onto the filter media, which is contained in a concrete structure. The substrate used as filter media depends on the target pollutants, and may consist of leaf compost, pleated fabric, activated charcoal, perlite, amended sand in combination with perlite, and zeolite. Two types of Media Filters are manufactured: Dry Media Filters, which are designed to dewater within 72 hours; and Wet Media Filters, which maintain a permanent pool of water as part of the treatment system.

Inspection & Maintenance

Maintenance in accordance with the manufacturer's requirements is necessary to ensure stormwater treatment. Inspection or maintenance of the concrete structure may require OSHA confined space training. Dry Media Filters are required to dewater in 72 hours, thus preventing breeding of mosquitos and other insects. Proper maintenance is essential to prevent clogging. Wet Media Filters require tight fitting seals to keep mosquitoes and other insects from entering and breeding in the permanent pools. Required maintenance includes routine inspection and treatment.

Recommended Maintenance Schedule

Activity	Time of Year	Frequency
Inspect for standing water, trash, sediment and clogging	Per manufacturer's schedule	Bi-Annually (minimum)
Remove trash and debris	N/A	Each Inspection
Examine to determine if system drains in 72 hours	Spring, after large storm	Annually
Inspect filtering media for clogging	Per manufacturer's schedule	Per manufacturer's schedule

Contech Vortechs

Description

Vortechs is a hydrodynamic separator that combines swirl concentration and flow controls into a shallow treatment unit that traps and retains trash, debris, sediment, and hydrocarbons from stormwater runoff. Vortechs removes sediment down to 50 microns and is beneficial for projects that require a shallow treatment device due to groundwater, utility, or bedrock constraints.

Inspection & Maintenance

The Vortechs system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. Maintaining a Vortechs can be accomplished using a vacuum truck, with no requirement to enter the unit. If such a truck is not available, a "clamshell" grab may be used, but manual removal of sediment and other pollutants may be required. The rate at which the system collects pollutants depends on site activities and should be noted during inspections. Required maintenance includes routine inspection and cleaning.

Recommended Maintenance Schedule

Activity	Time of Year	Frequency
Inspect for standing water, sediment depth, clogging, and floatables per manufacturer requirements	Spring and Fall	Bi-Annually (minimum)
Remove sediment and other trapped pollutants	During dry weather conditions when no flow is entering the system	When sediment depth accumulates to within 12 to 18 inches of the dry-weather water surface elevation
Remove oil or gasoline spill immediately upon discovery	As needed	Immediately upon discovery

See the following website for additional information about Contech Vortechs:
https://www.conteches.com/stormwater-management/treatment/vortechs

Contech Stormceptor

Description

The Stormceptor is a is a hydrodynamic separator targeting hydrocarbons and TSS in stormwater runoff. It improves water quality by removing contaminants through the gravitational settling of fine sediments and flotation of hydrocarbons while preventing the re-suspension or scour of previously captured pollutants.

Inspection & Maintenance

Maintenance can be performed with a standard vacuum truck. No entry into the unit is required for maintenance (in most cases). If entry is necessary, confined space entry protocols should be followed. The need for maintenance can be determined easily by inspecting the unit from the surface. The depths of oil and sediment in the unit can be determined by inserting dipsticks per manufacturer guidelines. Maintenance should be performed once the sediment depth exceeds the guideline values provided by the manufacturer.

Recommended Maintenance Schedule

Activity	Frequency
Inspect for oil and sediment accumulation and immediately after an oil, fuel or chemical spill.	Post-construction, bi-annually for the first year, as needed based on first-year observations for subsequent years
Remove sediment and other trapped pollutants	Annually or as needed
Remove oil or gasoline spill immediately upon discovery	Immediately upon discovery

See the following website for additional information about Contech Stormceptor:
https://www.conteches.com/stormwater-management/treatment/stormceptor-systems

Contech CDS

Description

The CDS is a swirl concentrator hybrid technology that uses continuous deflective separation – a combination of swirl concentration and indirect screening to screen, separate, and trap debris, sediment, and hydrocarbons from stormwater runoff. CDS is used to meet trash Total Maximum Daily Load (TMDL) requirements, for stormwater quality control, inlet and outlet pollution control, and as pretreatment for filtration, detention/infiltration, bioretention, rainwater harvesting systems, and Low Impact Development designs.

Inspection & Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants depends on site activities and should be noted during inspections. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure, or other measuring instrument. Maintaining a CDS can be accomplished using a vacuum truck, with no requirement to enter the unit.

Recommended Maintenance Schedule

Activity	Time of Year	Frequency
Inspect for clogging and accumulation of oil, trash, and sediment.	Spring and Fall	Bi-Annually (minimum).
Remove sediment and other trapped pollutants.	During dry weather conditions when no flow is entering the system	When the level of sediment reaches 75% of capacity in the isolated sump or when an appreciable level of oil and trash has accumulated.
Remove oil or gasoline spill immediately upon discovery.	N/A	Immediately upon discovery.

See the following website for additional information about Contech Stormceptor:
https://www.conteches.com/stormwater-management/treatment/cds

Other BMPs

Dry Detention Basin

Description

A dry detention basin is an impoundment or excavated basin for the short-term detention of stormwater runoff from a completed development that allows a controlled release from the structure at downstream, pre-development flow rates. Conventional dry detention basins typically control peak runoff for 2-year and 10-year 24-hour storms. They are not specifically designed to provide extended dewatering times, wet pools, or groundwater recharge. Sometimes flows can be controlled using an outlet pipe of the appropriate size but this approach typically cannot control multiple design storms.

Inspection & Maintenance

It is critical to provide access for maintenance, especially to the interior of the basin. Inspect dry detention basins at least once per year to ensure that they are operating as intended. Inspect basins during and after storms to determine if the basin is meeting the expected detention times. Inspect the outlet structure for evidence of clogging or outflow release velocities that are greater than design flow. Potential problems that should be checked include: subsidence, erosion, cracking or tree growth on the embankment; damage to the emergency spillway; sediment accumulation around the outlet; inadequacy of the inlet/outlet channel erosion control measures; changes in the condition of the pilot channel; and erosion within the basin and banks. Make any necessary repairs immediately. During inspections, note changes to the detention basin or the contributing watershed because these changes could affect basin performance. Mow the side slopes, embankment, and emergency spillway at least twice per year. Remove trash and debris at this time. Remove sediment from the basin as necessary, and at least once every 10 years or when the basin is 50% full. Provide for an on-site sediment disposal area to reduce the overall sediment removal costs.

Recommended Maintenance Schedule

Activity	Frequency
Inspect wet basins to ensure they are operating as designed.	At least once a year.
Mow the upper-stage, side slopes, embankment and emergency spillway.	At least twice a year
Check the sediment forebay for accumulated sediment, trash, and debris and remove it.	At least twice a year.
Remove sediment from the basin.	As necessary, and at least once every 10 years

Porous Pavement

Description

Porous pavement is a paved surface with a higher than normal percentage of air voids to allow water to pass through it and infiltrate into the subsoil. This porous surface replaces traditional pavement, allowing parking lot, driveway, and roadway runoff to infiltrate directly into the soil and receive water quality treatment. All permeable paving systems consist of a durable, load-bearing, pervious surface overlying a stone bed that stores rainwater before it infiltrates into the underlying soil. Permeable paving techniques include porous asphalt, pervious concrete, paving stones, and manufactured "grass pavers" made of concrete or plastic. Permeable paving may be used for walkways, patios, plazas, driveways, parking stalls, and overflow parking areas.

Inspection & Maintenance

In most porous pavement designs, the pavement itself acts as pretreatment to the stone reservoir below. Consequently, frequent cleaning and maintenance of the pavement surface is critical to prevent clogging. To keep the surface clean, frequent vacuum sweeping along with jet washing of asphalt and concrete pavement is required. No winter sanding shall be conducted on the porous surface. As discussed, designs that include an "overflow edge" provide a backup in case the surface clogs. If the surface clogs, stormwater will flow over the surface and into the trench, where some infiltration and treatment will occur. For proper maintenance:

- Post signs identifying porous pavement areas.
- Minimize salt use during winter months. If drinking water sources are located nearby (see setbacks), porous pavements may not be allowed.
- No winter sanding is allowed.
- Keep landscaped areas well maintained to prevent soil from being transported onto the pavement.
- Clean the surface using vacuum sweeping machines monthly. For paving stones, periodically add joint material (sand) to replace material that has been transported.
- Regularly monitor the paving surface to make sure it drains properly after storms.
- Never reseal or repave with impermeable materials.
- Inspect the surface annually for deterioration or spalling.
- Periodically reseed grass pavers to fill in bare spots.
- Attach rollers to the bottoms of snowplows to prevent them from catching on the edges of grass pavers and some paving stones.

Recommended Maintenance Schedule

Activity	Frequency
Monitor to ensure that the paving surface drains properly after storms	As needed
For porous asphalts and concretes, clean the surface using power washer to dislodge trapped particles and then vacuum sweep the area. For paving stones, add joint material (sand) to replace material that has been transported.	As needed
Inspect the surface annually for deterioration	Annually
Assess exfiltration capability at least once a year. When exfiltration capacity is found to decline, implement measures from the Operation and Maintenance Plan to restore original exfiltration capacity.	As needed, but at least once a year
Reseed grass pavers to fill in bare spots	As needed

Attachments

- Constructed Stormwater BMP Inspection Form

CONSTRUCTED STORMWATER BMP INSPECTION FORM

Date of Inspection	
Start Time	

BMP Type/Description:

Structural Pretreatment

- ☐ Oil/Grit Separators
- ☐ Sediment Forebays
- ☐ Vegetated Filter Strips

Treatment

- ☐ Bioretention Areas/Rain Gardens
- ☐ Constructed Stormwater Wetlands
- ☐ Extended Dry Detention Basins
- ☐ Sand and Organic Filters
- ☐ Wet Basins

Conveyance

- ☐ Drainage Channels
- ☐ Grassed Channels
- ☐ Water Quality Swale

Infiltration

- ☐ Dry Wells
- ☐ Infiltration Basins
- ☐ Infiltration Trenches
- ☐ Subsurface Structures

Other

- ☐ Dry Detention Basin
- ☐ Porous Pavement
- ☐ Other:

Proprietary

- ☐ Proprietary Separators
- ☐ Proprietary Media Filters
- ☐ Contech Vortech
- ☐ Contech Stormceptor
- ☐ Contech CDS

BMP Address and Location on Site	
Inspector Name, Title, and Contact Information	

Type of Inspection:

☐ Routine ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event

Weather at time of this inspection:

☐ Clear ☐ Cloudy ☐ Rain ☐ Sleet ☐ Fog ☐ Snow ☐ High Winds

☐ Other: Temperature (F):

Photo(s) Taken: Yes ☐ No ☐ If Yes, describe:

Are there any discharges occurring at the time of inspection? Yes ☐ No ☐ If yes, are any physical indicators present in the flow? If yes, describe below:

Indicator & Description	**Relative Severity Index (1-3)**
☐ **Color present:** ☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☐ 1 - Faint ☐ 2 - Clearly visible ☐ 3 - Brightly colored

CONSTRUCTED STORMWATER BMP INSPECTION FORM

Indicator & Description	Relative Severity Index (1-3)
☐ **Turbidity present:** ☐ Slight cloudiness ☐ Cloudy ☐ Opaque	☐ 1 - Faint ☐ 2 - Clearly visible ☐ 3 - Bright
☐ **Floatables present (does not include trash):** ☐ Sewage (toilet paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 - Few/slight ☐ 2 - Some ☐ 3 - Many/obvious
☐ **Odor present**: ☐ Sewage ☐ Sulfide ☐ Rancid/sour ☐ Petroleum/gas ☐ Other:	☐ 1 - Faint ☐ 2 - Easily detected ☐ 3 - Noticeable from a distance

Maintenance Needs Observed	☐ Erosion ☐ Invasive species ☐ Dead vegetation ☐ Trash or debris ☐ Grates	☐ Filters/filter media ☐ Basins ☐ Slope integrity ☐ Cracking ☐ Clogging	☐ Standing water ☐ Sediment depth ☐ Deterioration ☐ Oil or gas ☐ Other:
Maintenance Performed Date: _____	☐ Repaired erosion ☐ Removed invasive species ☐ Removed trash/debris ☐ Removed sediment ☐ Pruned	☐ Reseeded ☐ Mowed ☐ Replaced vegetation ☐ Replaced media ☐ Mulched	☐ Cleaned ☐ Raked ☐ Other:
Additional Maintenance Required	Yes ☐ No ☐	If yes, describe:	
Other Notes			

Appendix I
Supporting Calculations for Implementation Cost

BMP Type / Schedule	Permit Year 5	Permit Year 6	Permit Year 7	Permit Year 8	Permit Year 9	Permit Year 10	
Catch Basin Cleaning	2024	2025	2026	2027	2028	2029	Total Year 6-10
Total Cost (cost from contractor)	$ 85,000	$ 85,000	$ 85,000	$ 85,000	$ 85,000	$ 85,000	$ 425,000
							$ -
Present Worth	$ 85,000	$ 85,000	$ 85,000	$ 85,000	$ 85,000	$ 85,000	$ 425,000
Total Life Cycle Costs - Future Value (FV)[1]	$ 85,000	$ 86,700	$ 88,434	$ 90,203	$ 92,007	$ 93,847	$ 451,190
Enhanced Street Sweeping Program	2024	2025	2026	2027	2028	2029	PY6-PY10
Operating Costs (Labor, Disposal, Equipment Maintenance)	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 660,000
Capital (Periodic Purchase Sweeper)		$ 240,000					$ 240,000
Present Worth	$ 132,000	$ 372,000	$ 132,000	$ 132,000	$ 132,000	$ 132,000	$ 900,000
Total Life Cycle Costs - Future Value (FV)[1]	$ 132,000	$ 379,440	$ 137,333	$ 140,079	$ 142,881	$ 145,739	$ 945,472
(1) Inflation Rate for FV Calculation	**2.0%**						

Appendix J
Public Comment Record Keeping

Appendix K
Documentation of PCP Implementation

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