Stormwater Management Program (SWMP)

The Town of Hudson

12 School Street, Hudson, New Hampshire 03051

EPA NPDES Permit Number *NHR041013*

June 2019

(2021 update)

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Authorization

The Town of Hudson, New Hampshire ("Hudson") has established a stormwater pollution team to prepare and implement the various plans, policies, procedures, and measures needed to comply with EPA's 2017 MS4 Stormwater Permit. The team members are listed on page 4 and consist of representatives from the Department of Public Works, Engineering, and Planning.

The Environmental Protection Agency granted authorization to Hudson for permit coverage via a Letter of Authorization dated **March 18, 2019**.

The Authorization Letter can be found at the following web address, and in Appendix A and is posted on the Town's web site.

Town of Hudson, NH website
http://www.hudsonnh.gov/departments/engineering/storm-water

Certification

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

Printed Name: Stephen Malizia

Signature:

Date: June 28, 2019

Title: Town Administrator

Introduction

Permit Background

On January 18, 2017, EPA Region 1 reissued its New Hampshire General Permit for Stormwater Discharges associated with Small Municipal Separate Storm Sewer Systems (MS4) to replace the 2003 MS4 permit. The 2017 MS4 Permit authorizes stormwater discharges from "traditional" (i.e., cities and towns) and "non-traditional" (i.e., Federal and state agencies) MS4 Operators located in the "Urbanized Area" as defined by the 2010 Census Bureau. This 2017 MS4 Permit ("MS4 Permit") became effective on July 1, 2018 and will remain in effect for five years or until July 1, 2023 or will be continued until such time that EPA reissues a new MS4 permit.

The Town of Hudson had permit coverage under the 2003 MS4 Permit as well and established numerous educational, training and preventative measures to minimize potential pollutant contributions associated with stormwater discharges from its facilities.

The MS4 Permit mostly applies to the south central and southeast portions of the State of New Hampshire. This Urbanized Area includes 44 cities and towns, either in their entirety or portions thereof. The Town of Hudson resides entirely within the Urbanized Area, making all storm sewer system components and facilities subject to the new MS4 Permit.

SWMP Background

This Stormwater Management Program (SWMP) describes Hudson's plan to address the 2017 MS4 Permit requirements and minimize its impact on water quality to receiving water bodies from stormwater runoff in its Urbanized Area. The document is intended to be a "Living Document" and will be updated and/or modified during the permit term as new information is developed and/or if Hudson's activities are modified, changed or updated to meet permit conditions. The need for SWMP updates will be assessed as part of the Annual Reporting process to be completed by end of September 29 of each year.

This SWMP describes Hudson's activities and measures that will be implemented to meet the terms and conditions of the MS4 Permit. The document is intended to be a "Living Document" and will be updated and/or modified during the permit term as new information is developed and/or if the Town's activities are modified, changed or updated to meet permit conditions during the permit term. The need for SWMP updates should be assessed as part of the Annual Reporting process in September of each year. A full inventory of items to be included in the SWMP Annual Report can be found in the Annual Report section of this Plan.

Similar to the 2003 Permit, the 2017 MS4 Permit requires the following Six Minimum Control Measures (MCMs) to be part of the Town's Stormwater Management Program:

MCM1: Public Education and Outreach. A public education program to develop and deliver educational messages to residents, businesses, developers, contractors as well as Town employees who perform various outdoor maintenance activities and/or utilize the Town's facilities, and could affect stormwater quality.

MCM 2: Public Involvement and Engagement. An opportunity for the public to participate and provide comments on the stormwater program.

MCM 3: Illicit Discharge Elimination Program. A program to effectively detect and eliminate illicit discharges within the MS4 regulated area.

MCM 4: Construction Site Erosion Control Review and Inspections. A program to ensure developers include adequate sediment and erosion control measures and the measures are monitored during construction projects disturbing greater than one acre.

MCM 5: Post-Construction Stormwater Controls. A program to ensure that adequate post-construction stormwater measures are included on development projects in the MS4 regulated area and these stormwater controls are maintained.

MCM 6: Good Housekeeping & Pollution Prevention for Municipal Operations. A program to ensure that stormwater pollution sources stored or maintenance activities performed on municipal properties utilize best practices to minimize pollution inputs to stormwater.

MS4 Notice of Intent and Authorization

The MS4 Notice of Intent (NOI) was submitted on September 17, 2018. Authorization to discharge was granted to the Town from the EPA on March 18, 2019. The Town of Hudson's NOI and EPA Authorization letter can be found in **Appendix A**.

Stormwater Team

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Stormwater Outfalls and Receiving Water Bodies

Hudson currently has identified approximately 490 stormwater outfalls that are within the Urbanized Area and discharging to waters of United States and, thus, are subject to the MS4 Permit. A map of the identified outfalls and receiving waters is provided in Appendix C or can be found on Town web site.

http://www.hudsonnh.gov/departments/engineering/storm-water

The Table below provides a summary of the relevant water quality impairments according to the state's 2018 303(d) list of impaired waters**.**

Since the 303(d) list of impairments is updated every 2 years, the water quality impairments may change with new ones added and/or existing impairments may be removed as well as the addition of new TMDLs. The Town will report on any changes to the receiving waters list with each future annual report.

Requirements for Water Quality Impaired Water Bodies

The 2017 MS4 Permit imposes additional requirements for stormwater discharges to impaired or water quality limited water bodies. These include enhanced good housekeeping measures and source control plans for chloride and nutrient impaired waters. The Town of Hudson has two nutrient impaired water bodies (Robinson and Otternick Ponds) and several bacteria impaired water bodies based on the 2018 state 303(d) list of impaired water bodes. Robinson Pond also has an EPA-approved Total Maximum Daily Load (TMDL) for phosphorus.

Table 1.1 summarizes the additional requirements for water quality impairments and pollutants of concern.

Table 1.1: Summary of Impaired Waters and Water Quality Limited Requirements

Bacteria Impaired Waters	Sample for bacteria as part of IDDE outfall screening. Categorize outfalls as high priority for IDDE screening. Annual pet waste messages and cleanup stations/signs in parks & other popular dog walking areas.
Nutrient Impaired Waters	Sample for specific nutrient as part of IDDE outfall screening. Enhanced street sweeping at least twice/year Annual educational messages for pet waste, fertilizer/grass clippings & septic system maintenance
Robinson Pond Phosphorus TMDL	Sample for Total Phosphorus as part of IDDE outfall screening. Annual educational messages for pet waste, fertilizer & septic systems Enhanced street sweeping at least twice/year Update local regs to require new and redevelopment to install BMPs optimized for phosphorus removal Develop a Draft Phosphorus Control Plan by **June 2022**

Table 1.2: Summary of Receiving Waters, No. of Outfalls and Water Quality Impairments

Receiving Waterbody by Assessment Unit	Number of outfalls into receiving water	Nitrogen	Phosphorus	Bacteria	Chloride	Solids, metals and oil and grease	Other pollutant(s) causing impairments
Unnamed Brook (NHIMP700061002-03)	5						
Beaver Brook (NHIMP700061203-10)	2						
Beaver Brook (NHRIV700061203-21)	31						
Beaver Brook (NHRIV700061203-22)	2						
Merrill Brook - Ice Pond Dam (NHIMP700061206-01)	5						
Merrill Brook (NHRIV700061206-02)	18						pH
Merrill Brook (NHRIV700061206-03)	6						pH
Merrill Brook - Unnamed Brook (NHRIV700061206-04)	38						
Fire Pond Dam (NHIMP700061206-05)	3						
Village at Barretts Hill Upper Pond (NHIMP700061206-09)	4						
Village at Barretts Hill Lower Pond (NHIMP700061206-10)	1						
Robinson Pond (NHLAK700061203-06-01)	8		X				Chlorophyll-a, Cyanobacteria Dissolved Oxygen, pH
Robinson Pond - Beach (NHRIV700061203-35)	1			X			Cyanobacteria
Otternick Pond (NHLAK700061206-02)	3		X				Chlorophyll-a, Dissolved Oxygen, pH
Unnamed Pond (NHLAK700061206-03)	9						
Chase Brook - Unnamed Brook (NHRIV700061002-08)	1						
Unnamed Brook (NHRIV700061002-11)	21						
Reeds Brook (NHRIV700061002-12)	38						
Merrimack River (NHRIV700061002-14)	31						
Merrimack River (NHRIV700061206-24)	38						
Unnamed Brook (NHRIV700061002-19)	9						
Howard Brook (NHRIV700061203-25)	1						pH
Launch Brook (NHRIV700061203-26)	10			X			
Unnamed Brook (NHRIV700061203-36)	4						
Juniper Brook (NHRIV700061203-37)	5						
Glover Brook (NHRIV700061206-01)	31						pH
First Brook (NHRIV700061206-05)	3						pH
First Brook (NHRIV700061206-06)	12						
First Brook (NHRIV700061206-07)	13						
Second Brook Unnamed Brook (NHRIV700061206-08)	11						
Second Brook Unnamed Brook (NHRIV700061206-09)	6						
Second Brook (NHRIV700061206-10)	44						pH
Unnamed Brook (NHRIV700061206-11)	19						
Unnamed Brook (NHRIV700061206-12)	1						
Unnamed Brook (NHRIV700061206-13)	19						
Musquash Brook (NHRIV700061206-20)	9						
Musquash Brook - Lawrence Brook (NHRIV700061206-22)	3						
Musquash Brook - Limit Brook (NHRIV700061206-23)	17						
Grand Total	**490**						

Endangered Species and Historic Property Eligibility

The Town of Hudson met the eligibility requirements under the previous 2003 permit and continues to carry forward the eligibility status under the 2017 MS4 permit. The following reflects the selected criteria used to indicate eligibility for Endangered Species and Historical Resources.

Endangered Species Documentation

The Town of Hudson has determined eligibility for the ESA under:

Criterion A: ☐ Criterion B: ☐ Criterion C: ☒

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 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.*

The EPA Letter of Authorization for permit coverage dated March 18, 2019 concurs that there is minimal potential for adverse effects to ESA Species associated with the Town of Hudson's anticipated Stormwater Management.

Historic Property Documentation

Hudson has determined permit eligibility for Historic Properties under:

Criterion A: ☒ Criterion B: ☐ Criterion C: ☐ Criterion D: ☐

Criterion A: *Municipal stormwater discharges, allowable non-stormwater discharges, and discharge-related activities do not have the potential to effect on historic properties and stormwater control measures will not be constructed or installed that cause less than 1 acre of subsurface disturbance.*

MCM 1: Public Education and Outreach

MCM 1: Overall Goal

Consistent with Section 2.3.2 of the 2017 MS4 Permit, the overall goal of the Public Education and Outreach Program is to increase awareness and educate residents and other key audiences on best practices to minimize the potential adverse effects on receiving water quality resulting from stormwater discharges within the MS4 area. The targeted audiences include:

- Residents
- Businesses, Institutions, and Commercial Facilities
- Developers, Engineers and Construction Contractors
- Industries

The Public Education and Outreach Program provides a means to disseminate information with residents, institutions, developers, and other entities in Hudson to promote more environmentally sensitive practices to maintain and improve water quality.

Educational Program Summary

The basic educational requirements outlined in the Permit requires the Town to deliver at least two (2) messages per year to four (4) different target audiences over the permit term including residents, businesses, institutions, and commercial facilities, developers and industrial facilities.

Additional educational messaging is required if any of the receiving waters are listed as bacteria or nutrient impaired. Several water bodies are considered bacteria impaired including the Merrimack River, Launch Brook, Robinson Pond Beach and Beaver Brook. Robinson Pond is also listed as phosphorus impaired. As a result, according to Appendix H requirements of the Permit, the Town must **deliver annual messages throughout the Permit term** that focus on curtailing or modifying activities that potentially contribute to either of the water quality impairments. Specifically, annual messages should be tailored to increase awareness and improve practices performed by residents and businesses and commercial establishments for the following items:

- Pet waste cleanup and disposal,
- Septic system management (i.e., routine pumping)
- Proper disposal of grass clippings
- Use of slow-release fertilizers or phosphorus-free fertilizers
- Proper disposal of leaf litter in the fall

Best Management Practices

Table 1-3 outlines the proposed message topics, message type, distribution methods and planned year of implementation for the various messages. Methods used to evaluate the effectiveness of educational messages will be described in future annual reports. Public education messages and materials will be retained in Appendix C of this SWMP.

Since 2019, the Town has annually disseminated educational material (Every Drop Post Cards) to dog owners at the time of issuance or renewal of dog license

The Town *has also annually disseminated educational messages on lawn maintenance/grass clippings, septic system maintenance and leaf litter disposal* to address water quality concerns for discharges to impaired water bodies.

Table 1-3: Summary of the Planned Educational BMPs for each Target Audience by Year

Educational BMP[1]	Target Audience	Target Month / Season	Schedule by Permit Year (Fiscal Year)				
			1 (FY19)	2 (FY20)	3 (FY21)	4 (FY22)	5 (FY23)
1-1: Pet Waste Flyers/Post Card/Signage	Residents and Businesses	March/April[2]	X	X	X	X	X
1-2: Grass Clipping /Limit Fertilizer Fact Sheet	Residents and Businesses[3]	April/May	X	X	X	X	X
1-3: "Get Pumped" Septic System Brochure	Residents	Sept.	X	X	X	X	X
1-4: Leaf Litter Disposal Fact Sheet	Residents	Oct-Nov.	X	X	X	X	X
1-5: Green SnowPro/ Salt Efficiency Fact Sheet[4]	Businesses	Fall/Winter			X		X
1-6: Erosion Control /SWPPP Factsheet	Developers (Construction)	Spring		X		X	
1-7: Low Impact Development Factsheet	Developers (Construction)	Summer		X		X	
1-8: Lawn Maintenance /Water Use Factsheet	Industrial Facilities	Spring			~~X~~	**X**	X
1-9: Waste Disposal /Spill Prevention Factsheet	Industrial Facilities	Fall			~~X~~	**X**	X

Notes: [1]The technical content and/or actual messages for these BMPs is assumed to be provided by other regional organizations that specialize in educational outreach such as NHDES, Nashua Region PC or UNH Cooperative Extension.

[2]The phosphorus impairment requirements specified in Appendix H suggest a June /July time frame for dog waste messaging, however, for residents, the messaging would be best during the dog license renewal period of March - April, which is more aligned with the bacteria impairment requirements in Appendix H.

[3] Similar fact sheets and messages can be used for businesses and commercial facilities as those used for residents, however, different methods of delivery will likely be utilized.

[4] ***It was subsequently determined that there are no chloride impaired waters and thus this message would no longer be necessary.***

BMP 1-1: Encourage Pet Waste Cleanup and Disposal

Target Audiences: Residents and Businesses (if applicable)

Description: Disseminate educational flyer and post cards encouraging pet-waste cleanup and proper disposal in early Spring during the dog relicensing period. Applicable businesses may include dog day care, pet stores or recreational businesses that allow dogs.

Responsible Department/Parties: DPW Operations/Town Engineer

Measurable Goal(s): Reduce the amount of visible dog waste in key areas of Town.

Timeline: Annually March/April (dog license renewal period);

BMP 1-2: Grass Clipping / Low Fertilizer Use Brochure/Fact Sheet

Target Audiences: Residents and Businesses (if applicable)

Description: Distribute educational fact sheet to residents and businesses to encourage recycling or proper disposal of grass clippings and to limit fertilizer usage or at a minimum use phosphorus free fertilizer especially in Robinson and Otternick Pond watersheds. Collaborate with NHDES and Nashua Region Stormwater Coalition.

Responsible Department/Parties: DPW Operations/Town Engineer

Measurable Goal(s): Host at least one presentation and/or demonstration project regarding low fertilizer use and grass clipping controls to reduce phosphorus inputs.

Timeline: Annually in April and May

BMP 1-3: Septic System Maintenance Brochure

Description: Collaborate and customize NHDES "Get Pumped" educational brochure on septic system Maintenance. Contact Ray Gordon at NHDES to request brochures and/or door hangers: 271-3571 or ray.gordon@des.nh.gov or Anthony Drouin 271-2818. Discuss NHDES opportunities to homeowners to pledge a septic system pump-out for a discount coupon. Schedule outreach with Septic Smart Week from September 16 to 20, 2019.

Responsible Department/Parties: DPW Operations

Measurable Goal(s): Increase the number of homeowners that have their septic system pumped by possibly incentivizing with discount if they sign up for the pledge to pump.

Timeline: Annually in September-October

BMP 1-4: Leaf Litter / Yard Waste Fact Sheet

Target Audiences: Residents and Businesses (if applicable)

Description: Collaborate with NHDES and Nashua Region Stormwater Coalition to distribute and post fact sheets on the timing, collection and proper disposal of leaf litter and yard waste.

Responsible Department/Parties: DPW Operations

Measurable Goal(s): Increase the number of homeowners bringing yard waste to West Road Transfer Station for composting rather dumping in backyard areas.

Timeline: Annually October - November

BMP 1-5: Salt Minimization / Green SnowPro Certification Fact Sheet

Target Audiences: Commercial and Industrial Businesses

Description: Encourage business property owners to utilize GreenSnowPro Certified applicators through an educational fact sheet or presentation.

Responsible Department/Parties: DPW Operations

Measurable Goal(s): Increase the number of business that require the use of certified applicators.

Timeline: 2020 (subsequently determined to be no longer needed – no chloride impaired waters)

BMP 1-6: Site Plan Review Fact Sheet/Checklist

Target Audiences: Developers, Engineers and Contractors

Description: Develop a brief factsheet or checklist detailing the required elements for site plan review and key items for approval. The checklist will outline the relevant stormwater management regulations that developers must meet for the review process.

Responsible Department/Parties: DPW Operations/Planning Department

Measurable Goal(s): Streamline the site plan review process and reduce the number of construction sites with insufficient or not properly installed erosion control measures.

Timeline: 2020 ***– completed***

BMP 1-7: Green Infrastructure Fact Sheet

Target Audiences: Developers, Engineers and Contractors

Description: Develop a brief factsheet detailing the benefits of green infrastructure and encourage developers to adopt the practices. Fact sheet will detail possible ways to incorporate green infrastructure including rain gardens and tree wells.

Responsible Department/Parties: DPW Operations/Planning Department

Measurable Goal(s): Get more developers to incorporate the use of LID practices and design in the site development process.

Timeline: 2022

BMP 1-8: Landscaping/Winter Maintenance Brochure

Target Audiences: Industries

Description: A brief factsheet detailing more environmentally-friendly lawn maintenance, reduced water use, and more efficient salt use at industrial facilities. The factsheet will detail water use efficiency goals and benefits to water quality.

Responsible Department/Parties: DPW Operations/Planning Department

Measurable Goal(s): Reduce the number of incidences of observed inefficient or poorly timed irrigation or lawn chemical applications through better timing and application controls. Increase the number of institutions that use certified GreenSno Pro applicators (the winter maintenance messaging is optional as there are no chloride impaired waters).

Timeline: 2023

BMP 1-9: Industrial Facility Good Housekeeping or Pretreatment Brochure

Description: A brief factsheet detailing good housekeeping for industrial facilities. The brochure will include topics related to proper trash/hazardous waste disposal, spill prevention/cleanup, and material storage.

Responsible Department/Parties: DPW Operations/Planning Department

Measurable Goal(s): Reduce the number of inadvertent spills or improper waste disposal.

Timeline: 2022

MCM 2: Public Involvement and Participation

MCM 2: Goal

Consistent with Part 2.3.3 of the 2017 MS4 Permit, the overall goal of the public involvement and participation program is to provide opportunities for the public to participate in the review and implementation of the SWMP.

Compliance with Regulatory Requirements

Consistent with Section 2.3.3.2, the Town will post the Final SWMP on the Town web site and related mapping to provide an opportunity for the public to review and comment on the SWMP. In addition to the SWMP, the Town will post educational materials to encourage greater public participation in stormwater related activities.

Best Management Practices

Table 2-1 provides a summary of the planned public involvement and participation BMPs consistent the permit requirements. Each of these current and proposed BMPs are described in greater detail below.

Table 2-1: Summary of the Planned Public Involvement/Participation BMPs

BMP Category	BMP Description	Responsible Parties	Implementation Year
Public Review (2.3.3.1)	2-1: Stormwater Management Plan will be posted on the Town's website for review	*Town Engineer*	*2019*
	2-2: Post EPA Stormwater Annual Report on Town stormwater web page	*Town Engineer*	*Ongoing*
Public Participation (2.3.3.2)	2-3: Provide hotline for reporting stormwater problem/violations	*Town Engineer*	*Ongoing*
	2-4: Town will hold hazardous waste/oil collections days for public	*Nashua Regional Planning Commission*	*2020*

Public Review

BMP 2-1: SWMP Review

Web Address: http://www.hudsonnh.gov/departments/engineering/storm-water

Description: The SWMP will be made available to the public for review. As changes are made over time, the revised SWMP will be reposted for public review.

Responsible Department/Parties: Town Engineer

Measurable Goal(s): Increase the number of residents who inquire or engage in Town stormwater related activities.

Timeline: 2019

BMP 2-2: Annual Stormwater Report Review

Web Address: http://www.hudsonnh.gov/departments/engineering/storm-water

Description: The Annual Report will be made available to the public for review. Report will be made available on the Town's website at the end of each reporting year

Responsible Department/Parties: DPW Operations/Town Hall

Measurable Goal(s): Track number of residents who provide comments on Annual Reports.

Timeline: Ongoing

BMP 2-3: Reporting Hotline

Hotline Number: (603) 886-6021

Description: A hotline/online comment card system will collect comments from the public regarding stormwater in the municipality. Comments could include reporting of stormwater issues/violations, project concerns, documents, and more.

Responsible Department/Parties: Town Engineer

Measurable Goal(s): Collect and track amount of public input

Timeline: Ongoing

BMP 2-4: Hazardous Waste/Used Oil Collection

Web Address: https://www.nashuarpc.org/energy-environmental-planning/household-hazardous-waste/

Description: The Nashua Regional Planning Commission (NRPC) hosts hazardous waste collection events for used oil products that cannot otherwise be disposed of in the normal waste collection service. Items/dates that can be collected will be provided to the public.

Responsible Department/Parties: Nashua Regional Planning Commission

Measurable Goal(s): Increase number of participants and amount of waste collected each year

Timeline: 2023

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

MCM 3: Goal

Consistent with Part 2.3.4 of the 2017 MS4 Permit, the overall goal of the Illicit Discharge Detection and Elimination (IDDE) program is to develop a process and protocols to systematically investigate, identify and eliminate illicit sources of non-stormwater discharges into the Town's storm drain system, as well as implement procedures to prevent such discharges.

Compliance with Regulatory Requirements

Table 3-1 provides a status update and a summary of the required completion dates of the major components of an IDDE Program as specified in the 2017 MS4 Permit. The specific details of each of these components are described in the following sections.

Table 3-1: Summary of Major IDDE Compliance Tasks

IDDE Task	Subtask	Permit Section	Status	Required Completion Date
3-1: Legal Authority to Prohibit Illicit Connections	Establish ordinance or other regulatory mechanism to prohibit illicit discharges	*2.3.4.a*	Done	06-30-2019
3.2 Written Plans	Procedure Plan	*2.3.4.6.c*	Done	06-30-2019
	Catchment Investigation Plan	*2.3.4.8.b*	TBD	12-30-2019
3-3 Sanitary Sewer Overflow Inventory	Include Inventory in IDDE Plan	*2.3.3.4*	See IDDE plan	
3.4 Outfall Mapping	Phase I Mapping	*2.3.4.5.a*	Done	07-01-2020
	Outfall Categorization by Impairment	*2.3.4.7.a*	Done	07-01-2020
	Catchment Delineation and Investigation (start delayed due to COVID)	*2.3.4.8*	TBD	07-01-2020
	Phase II Mapping	*2.3.4.5.b*	TBD	07-01-2028
3.5 Outfall Screening	IDDE Prep (Inspection Form & Sequence)	*2.3.4.7.a-e*	Done	06-30-2019
	Inspection Training/Screening	*2.3.4.11*	Done	06-30-2019
	Dry Weather Screening/Sampling	*2.3.4.7.b.iii*	Done	07-01-2021
	Outfall Reprioritization start delayed due to COVID)	*2.3.4.7.c*	TBD	07-01-2021
3.6 Catchment Investigations	Investigation of Structures/Drainage Areas	*2.3.4.8.c*	TBD	07-01-2028
	Wet Weather Sampling	*2.3.4.8.c.ii.2.b*	TBD	07-01-2028
3-7: Employee Training	IDDE Training for Employees	*2.3.4.11*	Yr3 Done	07-01-2020

BMP 3-1: Legal Authority

The 2003 Permit had a similar requirement that the permittee adopt an ordinance or other regulatory mechanism to prohibit and enforce the elimination of un-authorized non-storm water discharges into their system to the extent allowable under State law.

The Town adopted a Sewer Connection Ordinance (Ordinance No 77) last updated in May 2002 that regulates what can be connected to the sanitary sewer system and prohibits the discharge of non-stormwater flow into the municipal storm drain system. For any new development project, the ordinance requires a thorough review of any requested sanitary sewer connections as well as the proposed treatment of stormwater generated onsite.

The Town of Hudson's specific regulations pertaining to illicit discharges can be found at: http://www.hudsonnh.gov/departments/sewer

BMP 3-2: Written Illicit Discharge Detection and Elimination Plan

Consistent with the MS4 Permit, the Town has developed a separate, written IDDE Plan that describe specific procedures that will be used to perform and document the IDDE investigations as well as contain the following information:

- Reference/citation of the authority the permittee will use to implement all aspects of the IDDE program.
- Statement clearly identifying responsibilities regarding eliminating illicit discharges.
- Written procedures developed in accordance with the requirements for dry weather outfall screening and sampling and for catchment investigations

The Town's written IDDE plan can be found in the attached **Appendix E**.

BMP 3-3: Sanitary Sewer Overflow (SSO) Inventory

Section 2.3.3.4 of the permit specifies that the Town develop an inventory of all known locations where Sanitary Sewer Overflow (SSO's) have occurred in the last 5 years. An SSO is defined as any discharge of untreated sanitary wastewater from a municipal sanitary sewer system to receiving water body. The Permit requests that the following information be provided in the SWMP for each SSO discharge, if available. Any updates to this inventory should be included in the annual reports.

- Location (Approximate street crossing/address and receiving water)
- Statement indicating whether the discharge entered a surface water or MS4
- Date(s) and time(s) of each known SSO occurrence
- Estimated discharge volume(s)
- Description of occurrence including possible cause of overflow
- Completed mitigation/corrective measures
- Planned mitigation/corrective measures

The Town of Hudson has had no known SSO discharges in the last 5 years (based on information provided by Town Staff).

BMP 3-4: System Mapping Requirements

Phase I Mapping: The Town of Hudson has completed the Phase I mapping requirements consistent with the Permit. Existing mapping efforts from the 2003 Permit are being updated and will completed within two (2) years from the effective date of the permit (July 1, 2020). The Phase I mapping includes the following information:

- Outfalls and receiving waters (previously required by the MS4-2003 permit)
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- State owned stormwater treatment structures
- Water bodies identified by name and indication of all use impairments as identified on the most recent EPA approved 2016 NHDES List of Impaired Waters
- Initial catchment delineations. Topographic contours and drainage system information may be used to produce initial catchment delineations.

Phase II Mapping: Additional outfall features including the field-verified limits of the catchment area must be addressed in Phase II of the mapping requirements. Phase II mapping must be completed within ten (10) years of the effective date of the permit (July 1, 2028). The Phase II mapping requirements include the following information:

- Outfall spatial location (latitude/ longitude with a min. accuracy of +/-30 feet)
- Connecting Storm Drain Pipes and Open Channel Conveyances
- Manholes and Catch basins
- Refined catchment delineations. Catchment delineations must be updated to reflect information collected during catchment investigations.
- Municipal sanitary sewer system
- Municipal combined sewer system

Additional Mapping Considerations: Although not specifically required by the 2017 MS4 Permit, the following outfall features, and related information should be included in the geodatabase of the storm system:

- Storm drain material, shape, size (pipe diameter), age
- Interconnections with other municipal or privately-owned stormwater infrastructure
- Locations where municipal sanitary sewer systems exist, properties known or suspected to be served by a septic system, especially in high density urban areas
- Areas in Town where storm drains may be susceptible to flow from older septic systems
- Stormwater BMP Locations
- Inspection dates and work completed of past illicit discharge investigations
- Locations of suspected, known or corrected illicit discharges with dates and flow

Assessment and Priority Ranking of Outfalls/Interconnections

Consistent with Section 2.3.4.7 of the Permit, the Town has assessed and has initially prioritized stormwater outfalls in terms of their potential to have illicit discharges associated with sanitary sewer or other connections to internal building plumbing (e.g., floor drains, vehicle washing stations, etc.). Outfalls have been classified into four (4) different categories consisting of Problem Outfalls, High Priority, Low Priority, and Excluded Outfalls. High Priority outfalls are to be targeted first for dry-weather screening and sampling followed by Low Priority outfalls. Problem outfalls do not need to undergo dry weather screening but will require detailed catchment investigations. Excluded outfalls do not need to be investigated or sampled as part of the IDDE Process.

The criteria used to categorize outfalls into these four categories are defined below.

Problem Outfalls: Outfalls/interconnections that are known or suspected to have illicit discharges or connections based on past observances or sampling data. This includes any outfalls/interconnections where previous screening indicates likely sewer input. Likely sewer input indicators may include any of the following:

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

High Priority Outfalls: Outfalls/interconnections that are not considered to be Problem Outfalls but meet one or more of the following conditions:

- Discharge to a receiving water body that may pose a risk to public health given its use or proximity to public beaches, primary or secondary contact recreational activities, supports a surface water drinking water supplies or shellfish bed.
- Outfalls/interconnections that discharge to a bacteria impaired waterbody as listed in the most recent 303(d) list of water impaired water bodies.

Low Priority Outfalls: Outfalls/interconnections that are not classified as a Problem, High Priority or Excluded outfalls should be considered a Low Priority outfall.

Excluded outfalls: Excluded outfalls/interconnections are considered to have minimal potential to be connected sanitary sewers or have illicit connections and typically include outfalls conveying roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; or drainage from athletic fields, parks or undeveloped green space and associated parks without sanitary services; or have cross-country drain pipes that neither cross nor are in proximity to sanitary sewer alignments in undeveloped land.

Table 3-2 below summarizes the number of Town stormwater outfalls within each category based on a preliminary assessment of its outfalls**.**

Table 3-2: Estimated No. of Outfalls within Each Priority Category based on Initial Screening

IDDE Priority	Outfall Total
Problem	0
High Priority	102
Low Priority	278
Excluded	110
Grand Total	**490**

BMP 3-5: Dry Weather Screening and Sampling

The Town has performed an initial screening of outfalls to identify low and high priority outfalls in the MS4 area and those considered to be excluded consistent with the permit criteria. The outfalls were subsequently inspected to detect the presence of dry weather flow and/or any evidence of illicit discharge starting with high priority outfalls. Outfalls with observed flow during dry weather were sampled and tested for the following parameters:

- Ammonia
- Chlorine
- Conductivity/Salinity
- Bacteria (e. coli or Enterococcus)
- Surfactants
- Temperature
- Pollutant of Concern as specified in Appendix G of the MS4 permit

Table 3-3: Additional Pollutants of Concern to Address Water Quality Impairments

Water Body	Supplemental ADB Parameter name	Pollutant of Concern	No of Outfalls	Sample Bottle [1]	Holding Time	Preservative
Robinson Pond	Chlorophyll-a	Total Phosphorus	4	250 ml, P	28 days	Cool ≤6°C, H_2SO_4 pH <2
	Cyanobacteria hepatoxic microsystins					
	Phosphorus TMDL					
	Dissolved oxygen sat.					
	Escherichia coli	Escherichia coli	4			
Otternick Pond	Chlorophyll-a	Total Phosphorus	3	250 ml, P	28 days	Cool ≤6°C, H_2SO_4 pH <2
	Dissolved oxygen saturation					
Launch Brook	Escherichia coli	Escherichia coli	8			
Beaver Brook	Escherichia coli	Escherichia coli	2			
	Macroinvertebrate bioassessments	Total Phosphorus	2	250 ml, P	28 days	Cool ≤6°C, H_2SO_4 pH <2
Merrimack R - 14	Escherichia coli	Escherichia coli	31			
Merrimack R - 24	Escherichia coli	Escherichia coli	41			
	Chlorophyll-a	Total Phosphorus	41	250 mL, P	28 days	Cool ≤6°C, H_2SO_4 pH <2
	Aluminum	Total Aluminum	41			

Notes: The actual # of samples collected and will require lab analysis will depend on whether dry weather flow is observed at time of inspection.

Based on dry weather screening results, outfalls will be re-evaluated for priority ranking before initiating the next phase involving catchments investigations. Outfalls and interconnections that had indicators of sanitary sewer or other illicit discharges will be considered High Priority outfalls. The number of System Vulnerability Factors (SVFs) as described in the next section might also influence the reprioritization and ranking.

BMP 3-6: Catchment Investigation

The goal of catchment investigations is to investigate and identify MS4 infrastructure connected to the outfall and the limits of the contributing area that drains to each outfall. Catchment investigations are required if the dry weather screening and sampling indicated evidence of a potential illicit connection, or if one or more System Vulnerability Factors (SVFs), as discussed below, are present the catchment area.

- History of SSOs
- Manholes potentially serving storm and sanitary sewer alignments
- Trenches potentially serving storm and sanitary sewer alignments
- Crossings of storm and sanitary sewer alignments where the sanitary system passes above the storm system
- Sanitary sewer alignments with known or suspected underdrain systems
- Inadequate sanitary sewer level of service (LOS)
- Areas formerly served by combined sewer systems
- Areas with known or suspected sanitary sewer defects.

Consistent with the Permit timeline, a more detailed Catchment Investigation Plan will be developed by December 2019 following the completion of the Dry Weather Screening and Sampling process.

BMP 3-7: Employee Training

Annual training will be provided to any employees involved with the IDDE Program including how to recognize illicit discharges and SSO's. The Town will report on when, type and frequency of the any IDDE training in the annual report**.** *IDDE training was initially delayed due to the Covid-19 outbreak but a training workshop was completed in December 2020***.**

MCM 4: Construction Site Stormwater Runoff Control

MCM 4: Goal

Consistent with Part 2.3.5 of the 2017 MS4 Permit, the overall goal of the Construction Site Stormwater Control Program is to develop an effective internal review and inspection program that involves review and inspection of erosion control measures for new or redevelopment projects that disturb more than 1 acre of area and to ensure that these measures will minimize the potential for erosion and eroded sediment to be transported into storm drain system and/or be discharged to waters of the U.S.

Compliance with Regulatory Requirements

In large part, Chapter 290; the Stormwater Management Section of the Town's Site Plan Regulations includes many of the key erosion control review and inspection provisions for construction projects involving more than 1 acre of disturbance. Many of the erosion control measures requested by the MS4 Permit are included in Section 290-4; Design Standards.

The Planning Department and Planning Board has added more specific language in the April 2020 site plan regulations regarding erosion control, solid waste control, and the roles and responsibilities as well as the enforcement process to ensure corrective actions are taken when necessary. ~~This will occur as the Planning Board looks to update regulations in the next year to address the post-construction stormwater treatment requirements as part of MCM 5.~~

Table 4-1 presents the key Erosion Control related BMP required by the 2017 MS4 permit;

Table 4-1: Summary of Key Regulatory Requirements

Plan Element	Permit Section	Status	Completion Date
4-1: Written Procedures for Site Plan Review of EC measures	*2.3.5.3.a*	Done	05-01-2008
4-2: Site Inspection and Enforcement Written Procedures	*2.3.5.3.b*	***Done***	***April 2020***
4-3 Construction Waste Control Requirements	*2.3.5.3.d*	***Done***	***April 2020***

BMP 4-1: Site Plan Review Procedures

Completed Updates: The Town *has updated* their site plan review regulations to include enhanced stormwater treatment requirements consistent with Section 2.3.6 of the MS4 Permit requirements and anticipates developing a detailed checklist to help guide the Planning Board during the review process would be helpful. The checklist should include specific criteria for temporary stabilization measures on disturbed areas that will remain idle for more than 14 days instead of the current 30 days or for shorter periods like 3 to 7 days for steep slopes or areas that drain to critical water bodies.

BMP 4-2: Site Inspections & Enforcement of Erosion Control Measures

Completed Updates: *The Town Engineer has developed a site inspection and erosion control checklist that is used during construction inspections of proposed development and redevelopment projects consistent with the new MS4 permit requirements*.

BMP 4-3: Construction Site Waste Control Requirements

The Town's Site Plan Regulations establishes on-site waste management and disposal standards for property owners. The regulations require adequate storage containers be provided onsite to collect and contain solid and liquid waste generated onsite. The review of adequacy generally falls to the responsibility of the Town Engineer, DPW or Code Enforcement Officer. Although the regulations may not be entirely explicit with respect to construction site debris and temporary sanitary waste facilities during construction, the regulations generally cover all aspects of onsite waste generation and disposal.

Completed Updates: The Town Planning Department has added explicit language regarding construction site waste controls including measures to handle solid waste, sanitary waste and demolition debris consistent with the MS4 Permit.

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

MCM:5 Goal

Consistent with Part 2.3.6 of the 2017 MS4 Permit, the overall goal of the Post-Construction Stormwater Management Program is to adopt or update local stormwater regulations to ensure adequate stormwater treatment measures are included in new and/or redevelopment projects that will disturb 1 acre or more of area and to ensure these stormwater treatment measures are maintained to preserve the water quality treatment functions of the proposed BMP. As noted below, the level of stormwater treatment needed will depend on any water quality impairment linked to the receiving water body.

Compliance with Regulatory Requirements

Consistent with the Permit, the Town *has updated* their stormwater management regulations in April 2020 ahead of the required date of July 2020 to ensure adequate stormwater treatment measures are included for new or redeveloped sites and to ensure proper maintenance of installed stormwater controls. Any land disturbance greater than or equal to one (1) acre must be subject to regulation including disturbances less than one acre that are part of a larger common plan of development. Key regulatory elements to be included in the control plan are as follows;

Table 5-1: Summary of Key Regulatory Requirements

Plan Element	Sub-Task	Permit Section	*Status*	Required Completion Date
5-1. Ordinance / Regulatory Mechanism	Low Impact Development (LID) must be used to maximum extent	*2.3.6.a.ii.a*	***Completed***	April-2020
	~~Salt/snow storage and loading designed according to NHDES guidance~~	~~*2.3.6.a.ii.b*~~	~~In Progress~~	
	~~Select/Design infiltration practices in accordance with NH Stormwater Manual~~	~~*2.3.6.a.ii.c*~~	~~In Progress~~	
	New Development - Enhanced Stormwater control/treatment	*2.3.6.a.ii.d*	***Completed***	
	Redevelopment - Stormwater control/treatment	*2.3.6.a.ii.e*	***Completed***	
	Submit As-Built Plans	*2.3.6.b*	***Completed***	April-2020
5-2: Street/Parking Lot Design Guidelines	Review/ adopt guidelines to minimize new impervious cover and promote LID	*2.3.6.c*	Pending	07-01-2022
5-3: Green Infrastructure	Review zoning and design guidance to promote use of green infrastructure	*2.3.6.d*	Pending	07-01-2022
5-4: Retrofit Inventory / Priority Ranking	Review Town-owned property to identify potential locations for SW retrofits or improved BMPs	*2.3.6.e*	Pending	07-01-2022

Current Site Plan Review Stormwater Requirements

The Town recently updated its site plan application forms to ensure relevant stormwater management information was submitted for new and redevelopment projects. The following provides a comparison of the Town's current regulations to the 2017 MS4 Permit post-construction stormwater requirements:

Table 5-2: Comparison of Town's Current Regulations to Permit Requirements

Post-Construction Stormwater Provision	Current Town Stormwater Requirements	MS4 Requirement
Enhanced Storm Water Treatment for Water Quality	1. A STORMWATER MANAGEMENT AND EROSION CONTROL PLAN is required for any new development, redevelopment or subdivision with one or more of the following conditions: a. A cumulative disturbance > 20,000 sq. feet. b. Road or Street construction/ reconstruction resulting in 1 acre or more of disturbance. c. A Subdivision of more than 3 building LOTs. d. Work adjacent to or in wetlands buffer. e. Disturbance of CRITICAL AREAS 2. Disturbance of more than 20,000 sf but < 1 acre: requires a basic stormwater quality management system. At a minimum, use LID measures and peak flow control. 3. Enhanced Stormwater treatment for Disturbance > 40,000 sf and in the MS4 ***Area (see adjacent MS4 requirements***) 4. A BMP inspection and maintenance plan is required for post-construction BMPs	New development > 40,000 sf disturbance: Require BMPs designed to retain the WQV for total post-construction IC area calculated in accordance with Env-Wq 1540.10; Or 2. Require BMPs to provide 80% TSS & 50% nutrient removal Redevelopment; 3. Include BMPs to treat 30% of existing impervious area and 50% of any newly generated impervious area
As-Built Plans	***Sec 290-11 of the updated Site Plan Regs require submittal of as built plans no more than 2 years after project completion consistent with MS4 Permit.***	Requires submittal of As-Built Plans within 2 years of project completion
Street/ Parking Lot Design Guidelines	To be discussed for Year 4, current site plan regs are not explicit about limiting parking area and street widths to reduce the amount of impervious surface	Within 4 years of effective permit date, Town shall develop a report to assess the current street and parking lot design standards that effect the creation of impervious cover and modify standards to promote LID options.
Green Infrastructure	***Section 290-5 (A) of the current Site Plan Regs require that LID site planning and design strategies be included in any proposed development project disturbing more than 20,000 sq ft to the maximum extent practical consistent with the MS4 requirements.***	Within 4 yrs of effective permit date, Town shall develop a assess their local regulations to identity opportunities to promote LID site planning and require that LID design strategies be used to the maximum extent feasible.

Stormwater BMP Retrofit Inventory	***Need to discuss in Year 4 if there are any existing Town-owned land that may be suitable for stormwater BMPs and potential prioritization for future planning purposes.***	Within 4 years of the effective permit date, the Town will need to develop an inventory and priority rank all Town-owned permit owned property in terms of stormwater BMP retrofit potential. Beginning in the 5th Annual Report and each subsequent Annual Report, the Town shall report on progress made in implementing BMP retrofits to mitigate effects from existing IC area

~~***Planned Updates:*** The Southeast Watershed Alliance is in the process of updating its model stormwater regulations to address the enhanced stormwater treatment requirements required by the MS4 Permit. The Town will consider adopting these model regulations once completed. Since the required pollutant removal efficiencies are at the upper end of the rated performance capabilities for most BMPs, it will likely require that most if, not all, impervious area associated with new and redevelopment projects be treated.~~

~~Allowance for offsite mitigation for redevelopment projects will help to provide relief from existing densely developed parcels with severe space limitations for stormwater treatment.~~

MCM 6: Good House Keeping and Pollution Prevention for Municipal Operations

MCM 6: Goal

Consistent with Part 2.3.7 of the 2017 MS4 Permit, the overall goal is to develop an operations and maintenance program that emphasizes source control and minimizes the potential for pollutants to be exposed and transported by stormwater runoff into nearby water bodies from the Town's roadways, facilities and maintenance activities, as well as maintain the functional integrity of the stormwater infrastructure system.

Compliance with Regulatory Requirements

Consistent with Part 2.3.7 of the Permit, the Town has developed an inventory of municipally-owned facilities (e.g., roadways, buildings, parks and recreational facilities, vehicle maintenance, waste handling and disposal facilities) in the urbanized area.

An ~~DRAFT~~ Operations and Maintenance (O&M) Plan was completed in June 2020. The O&M Plan outlines specific protocols and practices that the Town uses in performing good housekeeping and pollution prevention measures at its facilities.

The Permit identifies four (4) principal type of permittee-owned facilities or activities that must be addressed in the O&M Plan:

a) Buildings and Facilities
b) Vehicle/Equipment Storage and Maintenance Facilities
c) Parks and Open Spaces
d) Stormwater Infrastructure (e.g., catch basins, outfalls and treatment BMPs)

The following section provides a description of the various BMPs related to Operations and Maintenance (O&M) practices for Town-owned buildings, recreational facilities and stormwater infrastructure including street sweeping, catch basin cleaning and stormwater BMP maintenance consistent with permit requirements. Review and an assessment of needs for measures conducted at School facilities will also need to be done as part of this process.

Responsible Department: **Department of Public Works / Town Engineer**

BMP 6-1: Parks and Open Space Operations and Maintenance

Description: The O&M Plan *includes* written O&M procedures to minimize the use and proper storage, and disposal of pesticides, herbicides, and fertilizers (PHF) for lawn maintenance and landscaping activities and ensure practices are protective of water quality. Protective practices include use of integrated pest management (IPM), recycling or proper disposal of lawn clippings and other vegetative waste, and the use of native and drought resistant landscaping materials.

Since Robinson Pond and Otternick Pond are listed as phosphorus-impaired, the Town will look to incorporate the following:

1. Use slow release nitrogen and phosphorus-free fertilizers on Town and School maintained property
2. Properly manage grass clippings and leaf litter to limit and minimize accumulation on paved surfaces, storm drain systems and adjacent water bodies or wetlands.

Other park and recreational O&M procedures include

1. Management of trash containers at parks (scheduled cleanings; sufficient number), and for placing signage in areas concerning the proper disposal of pet wastes.
2. Establish procedures to address waterfowl congregation areas where appropriate to reduce waterfowl droppings from entering the MS4.
3. Establish procedures to address erosion or poor vegetative cover when the permittee becomes aware of it; especially if the erosion is within 50 feet of a surface water [Part 2.3.7.1.a of the MS4 Permit].

Responsible Department: Department of Public Works/ School Dept

BMP 6-2: Buildings and Facilities

Description: The Town *has developed* an inventory and O&M procedures to maintain the building and grounds, parking lots for municipally-owned buildings including schools, police and fire stations, municipal pools, libraries, and parking garages and other facilities. *The following activities are described in the* Plan:

1. Use, storage, and disposal of petroleum products and other potential stormwater pollutants.
2. Provide employee training as necessary so that those responsible for handling these products know proper procedures. Ensure that Spill Prevention Plans are in place, if applicable, and coordinate with the fire department as necessary.
3. Develop management procedures for dumpsters and other waste management equipment. Sweep parking lots and keep areas surrounding the facilities clean to reduce runoff of pollutants [Part 2.3.7.1.b of the MS4 Permit].

Responsible Department: Department of Public Works

BMP 6-3: Vehicles and Equipment

Description: The O&M plan and associated SWPPP describes procedures for vehicle fueling and washing and to minimize exposure of vehicle related fluids and fuels for all municipal vehicles including the police and fire department. Establish procedures to ensure that vehicle wash waters are not discharged to the municipal storm sewer system or to surface waters. The permit does not authorize such discharges [Part 2.3.7.1.c of the MS4 Permit].

Responsible Department: **Department of Public Works**

Stormwater Infrastructure Operations and Maintenance

BMP 6-4: Street/Parking Lot Sweeping

Description: The MS4 Permit requires all Town owned roads and parking lots with curbs and/or catch basins be swept at least once per year in early spring following winter deicing applications. The Permit also requires close tracking and annual reporting of which streets are swept and the amount of sediment material recovered.

Phosphorus Impairment-Appendix H Requirements

Since the Otternick and Robinson Ponds are phosphorus impaired (based on the 2016 303(d) list), the Town also needs to comply with Part II of Appendix H, which requires that Town-owned streets and parking lots in these watershed areas be **swept a minimum of twice per year** (once in the spring (following winter deicing activity) and at least once in the fall (***following leaf fall***). Roadways and parking lots that are closest and drain directly to tidal waters should be considered the highest priority.

***Alternative*:** In lieu of post-leaf drop street sweeping in the fall, the Town can implement a fall leaf litter collection program to effectively minimize the leaf litter on impervious surfaces and in stormwater drainage structures.

Reporting Requirements:

The number of miles swept, and the volume or mass of material removed shall be reported in each annual report.

Responsible Department: **Highway Foreman**

BMP 6-5: Catch Basin Cleanings

Description: The MS4 permit requires the Town to establish a cleaning schedule that ensures that catch basins are cleaned frequently enough that no catch basin will be no more than 50% full at any time. The Town keeps of a log of catch basins cleaned and ensure proper storage of catch basin cleanings and street sweepings prior to disposal or reuse such that they do not discharge to receiving waters. The Permit also requires that a schedule be developed to prioritize areas that are either under construction, are known to receive heavy sediment loads or a suspected to contribute a higher nutrient load due to managed turf practices and/or improper pet waste disposal.

Reporting Requirements:

For each Annual Report, the Town will report on how many catch basins were cleaned and inspected, the total mass of material removed from all catch basins and whether any changes are planned to catch basin cleaning schedule to help ensure no sump is more than 50% full at any given time. *The Town is still collecting catch basin cleaning data to develop a plan to prioritize and optimize catch basin inspection and cleaning*.

Responsible Department: Highway Foreman

BMP 6-6: Stormwater Treatment BMP Inspection and Maintenance

Description: The Town annually inspects its stormwater BMPs that are under the Town's responsibility and treat stormwater runoff from roadways and/or parking lots.

Inspectors will document observations using the Town's Stormwater BMP inspection log (Excel file). Inspectors will note the depth of sediment or trash accumulation, any structural damage, any unusual staining, discoloration, foams, oil sheens, noxious odors or any other indicator of potential stormwater contamination. Inspectors should also note any excessive vegetation growth or damage to existing vegetation or soils. Suggested maintenance actions will be also included. Trapped oils and grease, other observed floatable materials and water within the BMP should be removed using appropriate vacuum truck prior to removing any accumulated sediment.

Reporting Requirements:

For each Annual Report, the Town will report on which BMPs ~~and~~ how many BMPs were inspected and whether any of corrective actions were taken or are planned as a result of the inspection findings.

Responsible Department: Highway Foreman/ Town Engineer

BMP 6-7: Winter Road Maintenance

Description: The MS4 permit requires the Town to develop snow and ice control practices for winter maintenance on roads, municipal parking lots and sidewalks to provide to minimize the use and storage of road salt and sand. The Town has begun and plans to expand the use of liquid deicers to increase the effectiveness and efficiency of road salt especially during cold temperatures below 20. The O&M Plan describes current and planned efficiency measures with respect to materials, equipment, training and weather forecasting tools.

There are currently no chloride impaired water bodies within Hudson that would require the need for a Salt Reduction Plan per Appendix H or F requirements of the Permit.

Responsible Department: Department of Public Works

BMP 6-8: Stormwater Pollution Prevention Plans (SWPPPs)

Description: Consistent with Section 2.3.7.2 of the Permit, the Town *has developed* Stormwater Pollution Prevention Plans (SWPPPs) for its DPW maintenance facility and West Road Transfer Station which are the only facilities that have outside storage of materials that may potentially exposed to stormwater. The SWPPP includes a map of the facility and a description of the activities that occur at the facility. The map shows location of stormwater outfalls, receiving waters, and any structural controls. Identify all activities that occur at the facility and the potential pollutants associated with each activity including the location of any floor drains.

The SWPPP includes instructions for conducting employee training and routine facility inspections and associated documentation forms. The SWPPPs were completed in 2020 consistent with the Permit requirements.

Responsible Department: Department of Public Works

BMP 6-9: Phosphorus Source Control Plan

Description: Consistent with Part III of Appendix F of the Permit, the Town is in the process of developing a Lake Phosphorus Control Plan (LPCP) like Robinson Pond, which is anticipated to be completed by *June 2022* or within 5 years of the effective date to identify phosphorus sources and control measures that can be implemented to try to meet the targeted load reduction from municipal areas within the watershed. The Plan will need to include an implementation schedule for next 10 years and identify the potential costs and funding sources to enable implementation. There are several interim milestones in the first 5 years including an assessment of regulations, legal authority and potential funding by year 3 to initiate Plan development. The plan should include structural and non-structural measures.

Responsible Department: Department of Public Works/ Engineering/Planning Dept.

BMP 6-10: Potential Structural BMP Retrofits on Town-owned Parcels

Description: Per Appendix F requirements, within 5 years of the effective permit date *(June 2023),* the Town will develop an inventory of potential Town-owned properties that represent feasible locations for stormwater BMP retrofits to treat existing paved areas and reduced existing pollutant loads. The inventory and feasibility assessment will be included in the 5th year Annual Report and incorporated into the LPCP.

Responsible Department: Department of Public Works/ Engineering/Planning Dept.

Annual Report Checklist

The following represents of Draft Checklist of key reporting items to be included in future Annual Reports. EPA has also indicated that they plan to release *updated* Annual Report templates *each year* few months ahead of each reporting date to assist permittees in developing their Annual Reports. The Town has submitted Annual Reports for each of the reporting dates in 2019 and 2020 to summarize relevant compliance activities completed in the previous permit year.

Self-Assessment

General overview of the internal Department coordination, meetings, training, staffing changes and new plan or document modifications used to comply with the permit.

BMP Selection Assessment

General description of the process for selecting and implementing BMPs (i.e., ongoing activities, collaborative efforts, new programs, staff and equipment resources).

BMPs for Meeting Total Maximum Daily Loads (TMDLs)

Description of BMPs implemented to comply with water bodies with a TMDL (**Appendix F**).

BMPs for Meeting Discharge Requirements to Impaired Waters

A description of BMPs implemented to comply with impaired water bodies (**Appendix H**).

Summary of Minimum Control Measures

MCM1: Public Education and Outreach

Audience	Message	Distribution Method(s)	Distribution Date(s)	Evaluation Method(s)	Program Change(s)

MCM2: Public Involvement and Participation

Event / Activity	Topic	Public Notice Compliance

MCM3: Illicit Discharge Detection and Elimination (IDDE)

- IDDE Mapping (status of completing Phase I and II mapping requirements)
- Outfall Ranking (summary of the problem, high, low and excluded outfalls)
- Status of IDDE Program Responsibilities and Systematic Procedures
- Outfall Screening and Monitoring Results
- Illicit Discharges Detected and Removed
- Employee Training

MCM4: Construction Site Stormwater Runoff Control

Written Procedures Update		
# of Project Plans Reviewed	**# of Inspections Completed**	**# of Corrective Actions**

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

- Ordinance/Regulation Update_____
- Street and parking Lot Design Assessment Review Status

MCM6: Operations and Maintenance (O&M) Program

- Facility and Equipment Inventory List Updates
- Facility Maintenance Activities

Catch Basins			
Total # of Catch Basins	**# Cleaned**	**# Inspected**	**Total Volume/Mass of Material Removed**

Street Sweeping	
Lane Miles Cleaned	**Volume/Mass of Material Removed**

MCM 6: Stormwater Pollution Prevention Plans

- Completion Status
- Site Inspection Status

MCM 6: Lake Phosphorus Control Plan

- Status Updates
- Interim Milestones

Activities Planned for Next Reporting Year

Changes to BMPs and/or Measurable Goals

Activities Undertaken by Contracted Entities

APPENDICES

A. NOI and EPA NPDES Authorization Letter

B. Endangered Species Act Documentation (IPaC)

C. Education Outreach Materials

D. Written Illicit Discharge Detection and Elimination (IDDE) Plan

E. IDDE Inspection Results and Data (Placeholder)

F. DRAFT Operations and Maintenance (O&M) Plan

G. O&M Logs and Compliance Tracking (Placeholder)

E. Employee Training Records

Appendix A

NOI and EPA NPDES Authorization Letter

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

VIA EMAIL

March 18, 2019

Stephen Malizia
Town Administrator

And;

Elvis Dhima, P.E.
Town Engineer
12 School Street
Hudson, NH 03051
edhima@hudsonnh.gov

Re: National Pollutant Discharge Elimination System (NPDES) Permit ID: NHR041013, Town of Hudson, NH

Dear Elvis Dhima:

Your Notice of Intent (NOI) for coverage under the 2017 NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in New Hampshire (MS4 General Permit) has been reviewed by EPA and appears to be complete. You are hereby granted authorization by EPA to discharge stormwater from your MS4 in accordance with applicable terms and conditions of the MS4 General Permit, including all applicable Appendices. This authorization to discharge expires at midnight on **June 30, 2023.**

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/new-hampshire-small-ms4-general-permit. Should you have

any questions regarding this permit please contact Suzanne Warner at warner.suzanne@epa.gov or (617) 918-1383.

Sincerely,

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

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

Part I: General Conditions

General Information

Name of Municipality or Organization: Town of Hudson | State: NH

EPA NPDES Permit Number (if applicable): NHR041013

Primary MS4 Program Manager Contact Information

Name: Elvis Dhima, P.E. | Title: Town Engineer

Street Address Line 1: 12 School Street

Street Address Line 2:

City: Hudson | State: NH | Zip Code: 03051

Email: edhima@hudsonnh.gov | Phone Number: (603) 886-6008

Fax Number: (603) 598-6481

Other Information

Stormwater Management Program (SWMP) Location (web address or physical location, if already completed): Town Offices / Engineering Dept. / DPW Office

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 ☐ D

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

MS4 Infrastructure (if covered under the 2003 permit)

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

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

Web address where MS4 map is published:

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

http://www.hudsonnh.gov/departments/engineering/storm-water

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): 04/13/85

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): 02/07/07

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): 02/07/07

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

Part II: Summary of Receiving Waters

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

New Hampshire list of impaired waters: http://des.nh.gov/organization/divisions/water/wmb/swqa/

.

Waterbody that receives flow from the MS4 and segment ID if applicable	Number of outfalls into receiving water segment	Chloride	Chlorophyll-a	Dissolved Oxygen/ DO Saturation	Nitrogen	Oil & Grease/ PAH	Phosphorus	Solids/ TSS/ Turbidity	E. coli	Enterococcus	Other pollutant(s) causing impairments
Unnamed Brook (NHIMP700061002-03)	5	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Beaver Brook (NHIMP700061203-10)	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Beaver Brook (NHRIV700061203-21)	31	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Beaver Brook (NHRIV700061203-22)	2	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Merrill Brook - Ice Pond Dam (NHIMP700061206-01)	5	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Merrill Brook (NHRIV700061206-02)	18	☐	☐	☐	☐	☐	☐	☐	☐	☐	pH
Merrill Brook (NHRIV700061206-03)	6	☐	☐	☐	☐	☐	☐	☐	☐	☐	pH
Merrill Brook - Unnamed Brook (NHRIV700061206-04)	38	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Fire Pond Dam (NHIMP700061206-05)	3	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Village at Barretts Hill Upper Pond (NHIMP700061206-09)	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Village at Barretts Hill Lower Pond (NHIMP700061206-10)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Robinson Pond (NHLAK700061203-06-01)	8	☐	☐	☐	☐	☐	☐	☐	☒	☐	
Robinson Pond - Beach (NHRIV700061203-35)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Otternick Pond (NHLAK700061206-02)	3	☐	☒	☒	☐	☐	☐	☐	☐	☐	pH
Unnamed Pond (NHLAK700061206-03)	9	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Chase Brook - Unnamed Brook (NHRIV700061002-08)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Unnamed Brook (NHRIV700061002-11)	21	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Reeds Brook (NHRIV700061002-12)	38	☐	☐	☐	☐	☐	☐	☐	☐	☐	

Waterbody that receives flow from the MS4 and segment ID if applicable	Number of outfalls into receiving water segment	Chloride	Chlorophyll-a	Dissolved Oxygen/ DO Saturation	Nitrogen	Oil & Grease/ PAH	Phosphorus	Solids/ TSS/ Turbidity	E. coli	Enterococcus	Other pollutant(s) causing impairments
Merrimack River (NHRIV700061002-14)	31	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Merrimack River (NHRIV700061206-24)	38	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Unnamed Brook (NHRIV700061002-19)	9	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Howard Brook (NHRIV700061203-25)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	pH
Launch Brook (NHRIV700061203-26)	10	☐	☐	☐	☐	☐	☐	☐	☒	☐	
Unnamed Brook (NHRIV700061203-36)	4	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Juniper Brook (NHRIV700061203-37)	5	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Glover Brook (NHRIV700061206-01)	31	☐	☐	☐	☐	☐	☐	☐	☐	☐	pH
First Brook (NHRIV700061206-05)	3	☐	☐	☐	☐	☐	☐	☐	☐	☐	pH
First Brook (NHRIV700061206-06)	12	☐	☐	☐	☐	☐	☐	☐	☐	☐	
First Brook (NHRIV700061206-07)	13	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Second Brook - Unnamed Brook (NHRIV700061206-08)	11	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Second Brook - Unnamed Brook (NHRIV700061206-09)	6	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Second Brook (NHRIV700061206-10)	44	☐	☐	☐	☐	☐	☐	☐	☐	☐	pH
Unnamed Brook (NHRIV700061206-11)	19	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Unnamed Brook (NHRIV700061206-12)	1	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Unnamed Brook (NHRIV700061206-13)	19	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Musquash Brook (NHRIV700061206-20)	9	☐	☐	☐	☐	☐	☐	☐	☐	☐	

Waterbody that receives flow from the MS4 and segment ID if applicable	Number of outfalls into receiving water segment	Chloride	Chlorophyll-a	Dissolved Oxygen/ DO Saturation	Nitrogen	Oil & Grease/ PAH	Phosphorus	Solids/ TSS/ Turbidity	E. coli	Enterococcus	Other pollutant(s) causing impairments
Musquash Brook - Lawrence Brook (NHRIV700061206-22)	3	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Musquash Brook - Limit Brook (NHRIV700061206-23)	17	☐	☐	☐	☐	☐	☐	☐	☐	☐	
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Notice of Intent (NOI) for coverage under Small MS4 General Permit

Part III: Stormwater Management Program Summary

Identify the Best Management Practices (BMPs) that will be employed to address each of the six Minimum Control Measures (MCMs).

For each MCM, list each existing or proposed BMP by category and provide a brief description, responsible parties/departments, measurable goals, and the year the BMP will be employed (public education and outreach BMPs also requires a target audience). **Use the drop-down menus in each table or enter your own text to override the drop down menu.**

MCM 1: Public Education and Outreach

BMP Media/Category (enter your own text to override the drop down menu)	**BMP Description**	**Targeted Audience**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal**	**Beginning Year of BMP Imple-mentation**
Displays/Posters/Kiosks	Maintain Educational Kiosks	Residents	Town Engineer / DPW Director	Update educational information annually	2019
Brochures/Pamphlets	Distribute brochure / fact sheet on SW quality and related water resources info	Residents	Town Engineer / DPW Director	Update brochure on storm water runoff related issues every other year	2020
Web Page	Include stormwater info on town web site	Residents	Town Engineer / DPW Director	Update web site annually and web address for public feedback	2021
Web Page	Post stormwater info issues related to Business/ Commercial	Businesses, Institutions and Commercial Facilities	Town Engineer / DPW Director	Record number of web page viewer hits and feedback	2019
Brochures/Pamphlets	Brochure / Fact Sheet on proper Turf and Winter Maintenance	Businesses, Institutions and Commerc	Town Engineer / DPW Director	Update brochure annually geared to business/institutions	2021
Brochures/Pamphlets	Brochure / Fact Sheet on local stormwater regs for development	Developers (construction)	Planning/zoning Department / Town Engineer	Review/update annually site plan approval application checklist	2020
Newspaper Articles/Press Releases	Encourage Green Infrastructure options in site plan review	Developers (construction)	Planning/zoning Department / Town Engineer	Review/update annually fact sheet on GI options in planning office	2022
Brochures/Pamphlets	Brochure on Industrial Facilities Good Housekeeping	Industrial Facilities	Town Engineer	Mail brochure every other year to industrial facilities	2022

Brochures/Pamphlets	Brochure/Fact Sheet on Turf Maintenance / Irrigation / Winter Maintenance	Industrial Facilities	Town Engineer	Include brochure / fact sheet on storm water with pretreatment renewal	2023
Videos	Use Existing Video Resources on Local Cable Channel	Residents	Town Engineer	update SW related video every two years to run on local cable channel	2023

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

Part III: Stormwater Management Program Summary (continued)

MCM 2: Public Involvement and Participation

BMP Categorization	Brief BMP Description (enter your own text to override the drop down menu)	Responsible Department/Parties (enter your own text to override the drop down menu)	Additional Description/ Measurable Goal	Beginning Year of BMP Imple-mentation
Public Review	SWMP Review	Town Engineer	Allow annual review of stormwater management plan and posting of stormwater management plan on website	2019
Public Participation	SWMP Review	Town Review	The updated SWMP will be posted on Town web site	2019
Public Participation	Hotline/webline - reporting problems/violations	Town Engineer	Illicit Discharge complaints/ public comment. Track # of calls and problems responded to. Make number accessible to public (website).	ongoing
Public Participation	Household haz. waste/used oil collection	Nashua Regional Planning Commission (NRPC)	Regional hazardous waste collection days five times per year. Drop off located near DPW garage.	annual
Public Review	Solicit Public Comment on Annual Report	Town Engineer	Make annual report available to public. Keep report on file at Community Development Office and web-page.	ongoing

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Part III: Stormwater Management Program Summary (continued)

MCM 3: Illicit Discharge Detection and Elimination (IDDE)

BMP Categorization (enter your own text to override the drop down menu)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)
SSO inventory	Develop SSO inventory in accordance of permit conditions	Town Engineer	Complete within 1 year of effective date of permit
Storm sewer system map	Create map and update during IDDE program completion	Town Engineer, DPW Director / External Contractor	Update map within 2 years of effective date of permit and complete full system map 10 years after effective date of permit
Written IDDE program development	Create written IDDE program	Town Engineer, DPW Director / External Contractor	Complete within 1 year of the effective date of permit and update as required
Implement IDDE program	Implement catchment investigations according to program and permit conditions	Town Engineer, DPW Director / External Contractor	Complete 10 years after effective date of permit
Employee training	Train employees on IDDE implementation	Town Engineer, DPW Director / External Contractor	Train annually
Conduct dry weather screening	Conduct in accordance with outfall screening procedure and permit conditions	Town Engineer, DPW Director / External Contractor	Complete 3 years after effective date of permit
Conduct wet weather screening	Conduct in accordance with outfall screening procedure	Town Engineer, DPW Director / External Contractor	Complete 10 years after effective date of permit
Ongoing screening	Conduct dry weather and wet weather screening (as necessary)	Town Engineer, DPW Director / External Contractor	Complete ongoing outfall screening on completion of IDDE program

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

Part III: Stormwater Management Program Summary (continued)

MCM 4: Construction Site Stormwater Runoff Control

BMP Categorization (enter your own text to override the drop down menu or entered text)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)
Site inspection and enforcement of Erosion and Sediment Control (ESC) measures	Complete written procedures of site inspections and enforcement procedures	Town Engineer, External Contractor	Complete within 1 year of the effective date of permit
Site plan review	Complete written procedures of site plan review and begin implementation	Town Engineer, External Contractor	Complete within 1 year of the effective date of permit
Erosion and sediment control	Adoption of requirements for construction operators to implement a sediment and erosion control program	Town Engineer, Planning Board	Complete within 1 year of the effective date of permit
Waste control	Adoption of requirements to control wastes, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes	Town Engineer, Planning Board	Complete within 1 year of the effective date of permit
Construction Public Complaint Hotline	Receive and Consider Public Comment	Town Engineer	Continue to solicit comments and evaluate any ideas
Construction Ordinance/Bylaw	Review Site Plan Approvals and hold pre-construction meetings with developers. Review SWPPP inspections	Town Engineer, Inspector, Code Enforcement Office	Continue notification, inspection and enforcement program. Actively train internal staff.

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Part III: Stormwater Management Program Summary (continued)

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

BMP Categorization (enter your own text to override the drop down menu or entered text)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)
As-built plans for on-site stormwater control	The procedures to require submission of as-built drawings and ensure long term operation and maintenance will be a part of the SWMP	Town Engineer, Planning and Zoning Dept, External Contractor	Require submission of as-built plans for completed projects
Target properties to reduce impervious areas	Complete an inventory and priority ranking of permitee-owned property and existing infrastructure that could be retrofitted with BMPs designed to reduce the frequency, volume and pollutant loads of stormwater discharges to its MS4 through the mitigation of impervious area	Town Engineer, Planning and Zoning Dept, External Contractor	Complete 4 years after effective date of permit and report annually on retrofitted properties
Allow green infrastructure	Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist	Town Engineer, Planning and Zoning Dept, External Contractor	Complete 4 years after effective date of permit and implement recomendations of report
Street design and parking lot guidelines	Develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support low impact design options.	Town Engineer, Planning and Zoning Dept, External Contractor	Complete 4 years after effective date of permit and implement recommendations of report

Ensure any stormwater controls or management practices for new development and redevelopment meet the retention or treatment requirements of the permit and consistent with the Southeast Watershed Alliance's Model Stormwater Standards for Coastal Watershed Communities	Adoption, amendment, or modification of a regulatory mechanism to meet permit requirements	Town Engineer, Planning and Zoning Dept, External Contractor	Complete 2 years after effective date of permit

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

Part III: Stormwater Management Program Summary (continued)

MCM 6: Municipal Good Housekeeping and Pollution Prevention

BMP Categorization (enter your own text to override the drop down menu or entered text)	**BMP Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)	**Measurable Goal** (all text can be overwritten)	**Beginning Year of BMP Imple-mentation**
O&M procedures	Create written O&M procedures including all requirements contained in 2.3.7.1 for parks and open spaces, buildings and facilities, and vehicles and equipment	Town Engineer, Town Planner, DPW Director	Complete and implement 2 years after effective date of permit	2020
Inventory all permittee-owned parks and open spaces, buildings and facilities, and vehicles and equipment	Create inventory	DPW Director / Town Engineer	Complete 2 years after effective date of permit and implement annually	2020
Infrastructure O&M	Establish and implement program for repair and rehabilitation of MS4 infrastructure	DPW Director / Town Engineer	Complete 2 years after effective date of permit	2020
Stormwater Pollution Prevention Plan (SWPPP)	Create SWPPPs for maintenance garages, transfer stations, and other waste-handling facilities	Town Engineer, DPW Director / External Contractor	Complete 2 years after effective date of permit	2020
Catch basin cleaning	Establish schedule for catch basin cleaning such that each catch basin is no more than 50% full and clean catch basins on that schedule	DPW Director	Clean catch basins on established schedule and report number of catch basins cleaned and volume of material moved annually, once every 3 years	2018
Street sweeping program	Sweep all streets and permitee-owned parking lots in accordance with permit conditions	DPW Director	Sweep all streets and permitee-owned parking lots once per year in the spring	2018

Road salt use optimization program	Establish and implement a program to minimize the use of road salt	DPW Director	Implement salt use optimization during deicing season, annual calibration of deicing applicators	2020
Inspections and maintenance of stormwater treatment structures	Establish and implement inspection and maintenance procedures and frequencies	DPW Director/ Town Engineer	Inspect and maintain treatment structures at least annually	

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.** If submitting a NHDES approved alternative reduction plan, attach and submit it with the NOI.

Applicable TMDL	**Action Description**	**Responsible Department/Parties** (enter your own text to override the drop down menu)
Robinson Pond (NHLAK700061203-06-01) (Phosphorus)	Adhere to requirements in Part III.1 of Appendix F	DPW Director / Town Engineer /External Contractor
Robinson Pond (NHLAK700061203-06-01) (E. coli)	Adhere to requirements in Part II.1 of Appendix F	DPW Director / Town Engineer /External Contractor
Launch Brook (NHRIV700061203-26) (E. coli)	Adhere to requirements in Part II.1 of Appendix F	DPW Director / Town Engineer /External Contractor
Beaver Brook (NHRIV700061203-22) (E. coli)	Adhere to requirements in Part II.1 of Appendix F	DPW Director / Town Engineer /External Contractor

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

Part III: Stormwater Management Program Summary (continued)

Actions for Meeting Requirements Related to Water Quality Limited Waters

Use the drop-down menus to select the pollutant causing the water quality limitation and enter the waterbody ID(s) experiencing excursions above water quality standards for that pollutant. In addition, if you are subject to additional requirements due to a downstream nutrient impairment (see Part 2.2.2 of the permit) select the pollutant of concern and indicate applicable waterbody IDs or write "all waterbodies" if applicable. Choose the action description from the dropdown menu and indicate the responsible party. If no options are applicable, or more than one, **enter your own text to override drop-down menus.**

Pollutant	Waterbody ID(s)	Action Description	Responsible Department/Parties (enter your own text to override the drop down menu)
Chlorophyll-a	Otternick Pond (NHLAK700061206-02)	Adhere to requirements in part II of Appendix H	DPW Director / Town Engineer

Part IV: Notes and additional information

Use the space below to indicate the part(s) of 2.2.2 that you have identified as not applicable to your MS4 and provide all supporting documentation below or attach additional documents if necessary.

Provide any additional information about your MS4 program below.

The listing of water quality impairments is based on the NHDES 2016 303(d) list that were identified for the Town of Hudson.

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 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 have no personal knowledge that the information submitted is other than 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. (40 CFR 122.22)

Name: Title:

Signature: Date:

[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

Appendix B

ESA & Historic Resource Eligibility Documentation

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

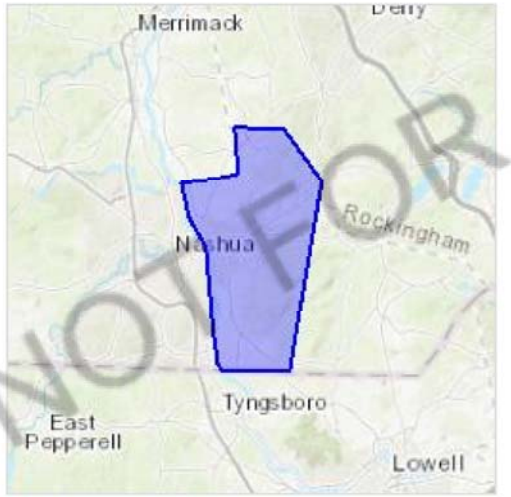
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Massachusetts and New Hampshire



Local office

New England Ecological Services Field Office

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

http://www.fws.gov/newengland

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species

[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

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

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional

maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere

Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Semipalmated Sandpiper Calidris pusilla This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Snowy Owl Bubo scandiacus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week

of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

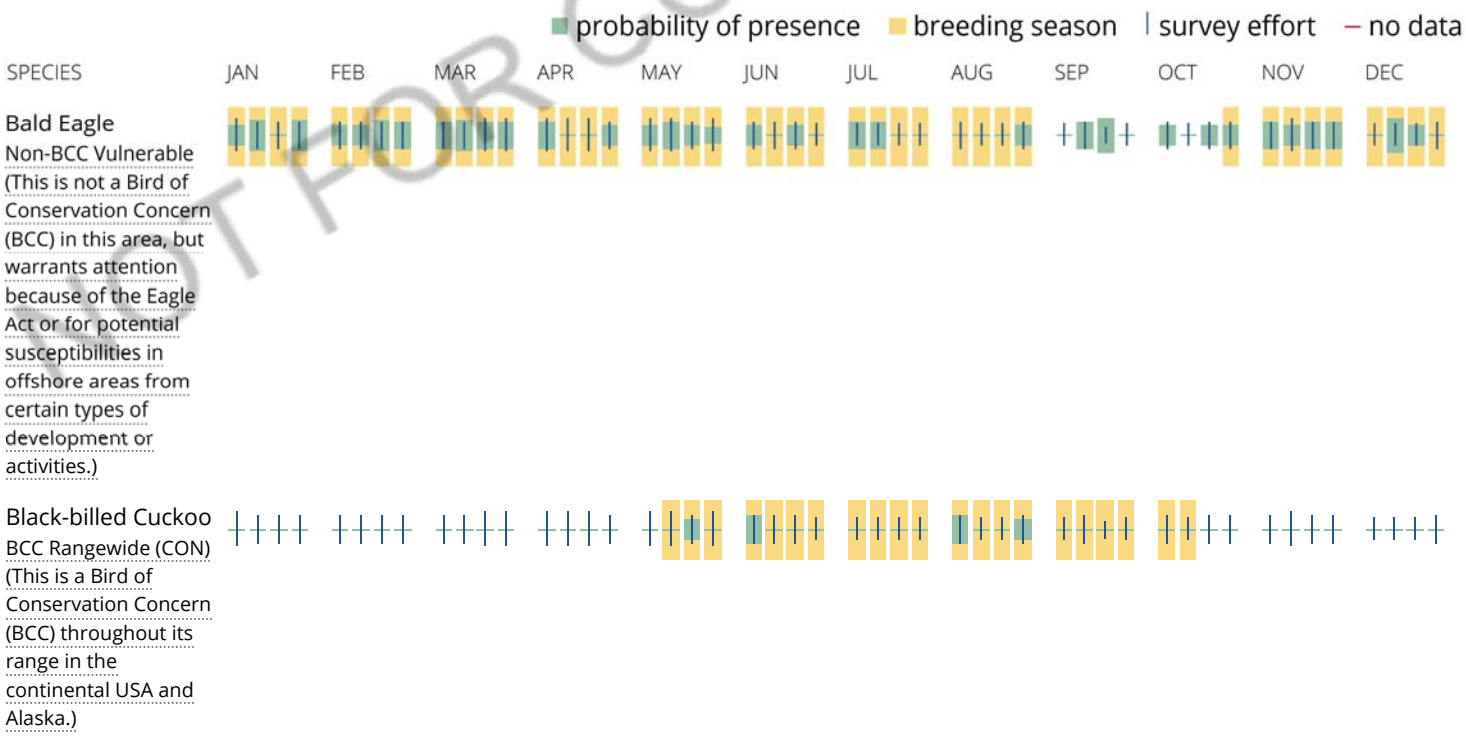
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

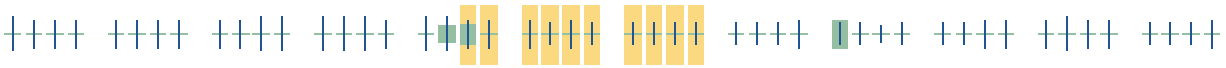
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

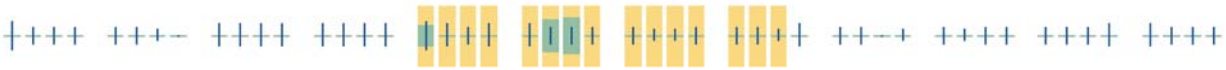
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Bobolink
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Eastern Whip-poor-will
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



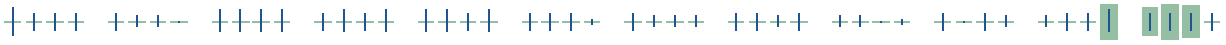
Lesser Yellowlegs
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Prairie Warbler
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

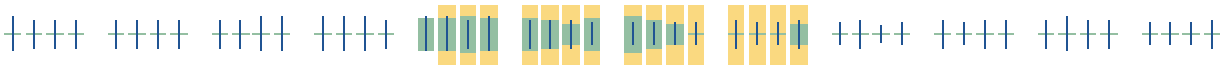
Rusty Blackbird
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Semipalmated Sandpiper
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Snowy Owl
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix C

Education Outreach Materials

EVERY DROP

Small Changes. Big Difference.

We love our dogs! But dog waste carries harmful bacteria that can make our waters unsafe for drinking or swimming. So always pick it up and throw it in the trash!

EVERY DROP

Small Changes. Big Difference.

Take the Pledge to Scoop the Poop!

Visit **stateofourestuaries.org/everydrop/petpledge** or scan the QR code to go straight to the page and let your town know that you're doing your part by scooping the poop!

Many NH towns have over 1,000 dogs living in them, and each dog "goes" once or twice a day. That's a lot of poop! Not only is it gross when it's left around, but it can be dangerous. Harmful bacteria and parasites - such as Giardia or Salmonella - that lives in pet waste, can come in contact with other people and pets or wash into nearby waterways or storm drains.

Picking up our dog's waste and throwing it out properly is a small change that can make a big difference in keeping our waters clean.

Five Small Changes that Make a Big Difference:

1. **Always carry a plastic bag when you walk your dog.**
2. **Always pick up that poop.**
3. **Always dispose of it in a trashcan.**
4. **Never put bagged or unbagged waste in a storm drain.**
5. **Take the Pledge to tell your town you're making a difference!**

Appendix D

Written Illicit Discharge Detection and Elimination (IDDE) Plan

Illicit Discharge Detection and Elimination (IDDE) Plan

Town of Hudson, New Hampshire

June 2019

Table of Contents

Illicit Discharge Detection and Elimination Plan
Town of Hudson, New Hampshire

Tables

Figures

1 Introduction

1.1 MS4 Program

This Illicit Discharge Detection and Elimination (IDDE) Plan has been developed by Hudson to address the requirements of the United States Environmental Protection Agency's (USEPA's) 2017 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in New Hampshire, hereafter referred to as the "2017 New Hampshire MS4 Permit" or "MS4 Permit."

In addition to the Stormwater Management Plan (SWMP), the 2017 MS4 Permit requires the Town to implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges into its municipal separate storm sewer system and implement procedures to prevent such discharges. This written IDDE Plan has been prepared to address this requirement.

1.2 Illicit Discharges

An "illicit discharge" is any discharge to a drainage system that is not composed entirely of stormwater, with the exception of discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the MS4) and discharges resulting from fire-fighting activities.

Illicit discharges may take a variety of forms. Illicit discharges may enter the drainage system through direct or indirect connections. Direct connections may be relatively obvious, such as cross-connections of sewer services to the storm drain system. Indirect illicit discharges may be more difficult to detect or address, such as failing septic systems that discharge untreated sewage to a ditch within the MS4 regulated area, or a sump pump that discharges contaminated water on an intermittent basis.

Some illicit discharges are intentional, such as dumping used oil (or other pollutant) into catch basins, a resident or contractor illegally tapping a new sewer lateral into a storm drain pipe to avoid the costs of a sewer connection fee and service, and illegal dumping of yard wastes into surface waters.

Some illicit discharges are related to the unsuitability of original infrastructure to the modern regulatory environment. Examples of illicit discharges in this category include connected floor drains in old buildings, as well as sanitary sewer overflows that enter the drainage system. Sump pumps legally connected to the storm drain system may be used inappropriately, such as for the disposal of floor washwater or old household products, in many cases due to a lack of understanding on the part of the homeowner.

Elimination of some discharges may require substantial costs and efforts, such as funding and designing a project to reconnect sanitary sewer laterals. Others, such as improving self-policing of dog waste management, can be accomplished by outreach in conjunction with the minimal additional cost of dog waste bins and the municipal commitment to disposal of collected materials on a regular basis.

Regardless of the intention, when not addressed, illicit discharges can contribute high levels of pollutants, such as heavy metals, toxics, oil, grease, solvents, nutrients, and pathogens to surface waters.

1.2.1 Allowable Non-Stormwater Discharges

The following categories of non-storm water discharges are allowed under the MS4 Permit unless the permittee, USEPA or New Hampshire Department of Environmental Services (NHDES) identifies any category or individual discharge of non-stormwater discharge as a significant contributor of pollutants to the MS4 regulated area:

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground water
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20))
- Uncontaminated pumped groundwater
- Discharge from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water, springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual resident car washing
- Flows from riparian habitats and wetlands
- De-chlorinated swimming pool discharges
- Street wash waters
- Residential building wash waters without detergents

If these discharges are identified as significant contributors to the MS4, they must be considered an "illicit discharge" and addressed in the IDDE Plan (i.e., control these sources so they are no longer significant contributors of pollutants, and/or eliminate them entirely).

1.2.2 Receiving Waters and Impairments

Table 1-1 lists the "impaired waters" within the boundaries of Hudson's regulated area based on the 2016 New Hampshire Integrated List of Waters. Impaired waters are water bodies that do not meet water quality standards for one or more designated use(s) such as recreation or aquatic habitat.

Table 1-1. Impaired Waters Hudson, New Hampshire

Water Body Name	Assessment Unit ID	Category	Impairment(s)	Associated Approved TMDL
Robinson Pond	NHLAK700061203-06-01	4a/c	Chlorophyll-a, DO Saturation, Non-native aquatic plants, pH, Cyanobacteria, E. coli	Phosphorus,
Otternick Pond	NHLAK700061206-02	4a, 5	DO saturation, pH, Chlorophyll-a	Non-native aquatic plants,
Merrimack River	NHRIV700061002-14	4a, 5	pH, Creosote	E. coli,
Robinson Pond – Beach Brook	NHRIV700061203-35	4a, 5	pH	
Merrill Brook – Unnamed Brook	NHRIV700061206-04	4a, 5	pH	
First Brook	NHRIV700061206-05	4a, 5	pH	
Second Brook – Unnamed Brook	NHRIV700061206-04	4a, 5	pH	
Second Brook	NHRIV700061206-10	4a, 5	pH	

Category 4a Waters – impaired water bodies with a completed Total Maximum Daily Load (TMDL).
Category 5 Waters – impaired water bodies that require a TMDL.
"Approved TMDLs" are those that have been approved by EPA as of the date of issuance of the 2017 MS4 Permit. Waters listed as impaired for Mercury and are subject to the Northeast Regional Mercury TMDL are not included in this Table since Appendix G of the Permit states that mercury sampling is not required.

1.3 IDDE Program Goals, Framework, and Timeline

The goals of the IDDE program are to find and eliminate illicit discharges to municipal separate storm sewer system and to prevent illicit discharges from happening in the future. The program consists of the following major components as outlined in the MS4 Permit:

- Legal authority and regulatory mechanism to prohibit illicit discharges and enforce this prohibition
- Storm system mapping
- Inventory and ranking of outfalls

- Dry weather outfall screening
- Catchment investigations
- Identification/confirmation of illicit sources
- Illicit discharge removal
- Follow-up screening
- Employee training.

The IDDE investigation procedure framework is shown in **Figure 1-1.** The required timeline for implementing the IDDE program is shown in **Table 1-2**.

Figure 1-1. IDDE Investigation Procedure Framework

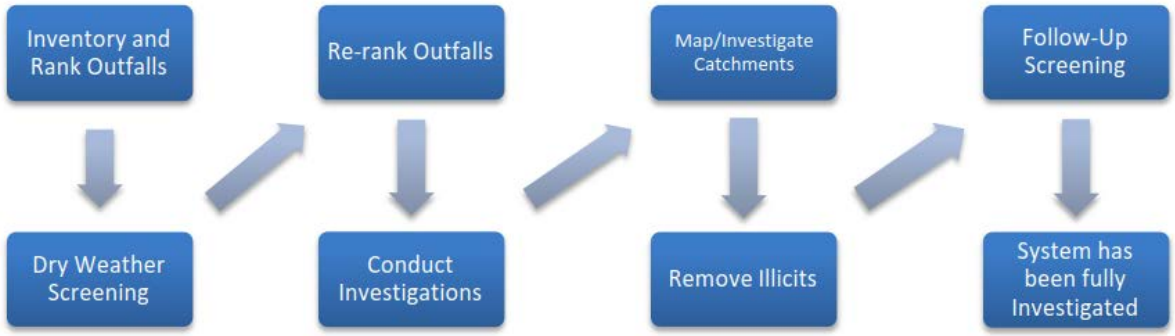


Table 1-2. IDDE Program Implementation Timeline

IDDE Program Requirement	Completion Date from Effective Date of Permit					
	1 Year	1.5 Years	2 Years	3 Years	7 Years	10 Years
Written IDDE Program Plan	X					
SSO Inventory	X					
Written Catchment Investigation Procedure		X				
Phase I Mapping			X			
Phase II Mapping						X
IDDE Regulatory Mechanism or By-law (if not already in place)				X		
Dry Weather Outfall Screening				X		
Follow-up Ranking of Outfalls and Interconnections				X		
Catchment Investigations – Problem Outfalls					X	
Catchment Investigations – all Problem, High and Low Priority Outfalls						X

1.3.1 Work Completed to Date

The 2003 MS4 Permit required each MS4 community to develop a plan to detect illicit discharges using a combination of storm system mapping, adopting a regulatory mechanism to prohibit illicit discharges and enforce this prohibition, and identifying tools and methods to investigate suspected illicit discharges. Each MS4 community was also required to define how confirmed discharges would be eliminated and how the removal would be documented.

The Hudson has completed the following IDDE program activities consistent with the 2003 MS4 Permit requirements:

- Developed a map of outfalls and receiving waters
- Adopted an IDDE bylaw
- Some Outfall Insprections

2 Authority and Statement of IDDE Responsibilities

2.1 Legal Authority

The Town of Hudson adopted a Regulation of Sewer Use (Ordinance 77) in 2002. The Sewer Use Ordinance provides the Hudson Hudson Town Engineer with adequate legal authority to:

- Prohibit illicit discharges
- Investigate suspected illicit discharges
- Eliminate illicit discharges, including discharges from properties not owned by or controlled by the MS4 that discharge into the MS4 system
- Implement appropriate enforcement procedures and actions.

The Hudson Town Engineer will review its current Sewer Use Ordinace as well as related stormwater management requrements as part of its Site Plan and Subdivision Regulations for consistency with the 2017 MS4 Permit.

2.2 Statement of Responsibilities

The Hudson Town Engineer is the lead municipal agent responsible for implementing the IDDE program pursuant to the provisions of the Sewer Use Ordinance. Other departments with responsibility for aspects of the program include:

- **Hudson Town Engineer** – Most program elements except those noted below.
- **Planning Board / Department** – Code enforcement and Illicit Discharge Regulations
- **Department of Public Works (DPW)** – Maintenance activities (e.g. Catch basin cleaning and street sweeping)

3 Stormwater System Mapping

Hudson originally developed mapping of its stormwater system to meet the mapping requirements of the 2003 MS4 Permit. A copy of the existing storm system map is provided in the SWMP. The 2017 MS4 Permit requires a more detailed storm system map than was required by the 2003 MS4 Permit. The revised mapping is intended to facilitate the identification of key infrastructure, factors influencing proper system operation, and the potential for illicit discharges.

The 2017 MS4 Permit requires the storm system map to be updated in two phases as outlined below. The Department of Public Works is responsible for updating the stormwater system mapping pursuant to the 2017 MS4 Permit and will report on the progress towards completion of the storm system map in each annual report. Updates to the stormwater mapping will be included in the SWMP.

3.1 Phase I Mapping

Phase I mapping must be completed within two (2) years of the effective date of the permit (by July 1, 2020) and include the following information:

- Outfalls and receiving waters (previously required by the MS4-2003 permit)
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- Municipally owned stormwater treatment structures
- Water bodies identified by name and indication of all use impairments as identified on the most recent EPA approved New Hampshire Integrated List of Waters report
- Initial catchment delineations. Topographic contours and drainage system information may be used to produce initial catchment delineations.

Hudson has completed the following updates to its stormwater mapping to meet the Phase I requirements:

- Outfalls and receiving waters (previously required by the MS4-2003 permit)
- Open channel conveyances (swales, ditches, etc.)
- Municipally owned stormwater treatment structures
- Water bodies identified by name and indication of all use impairments as identified on the most recent EPA approved New Hampshire Integrated List of Waters report initial catchment delineations. Any available system data and topographic information may be used to produce initial catchment delineations

Hudson will update its stormwater mapping by July 1, 2020 to include the remaining Phase I information.

3.2 Phase II Mapping

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

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

The Town has completed the following updates to its stormwater mapping to meet the Phase II requirements:

- Outfall spatial location (latitude and longitude with a minimum accuracy of +/-30 feet)
- Pipes
- Manholes
- Catch basins
- Municipal Sanitary Sewer system

Hudson will update its stormwater mapping by July 1, 2028 to include the remaining Phase II information.

3.3 Additional Recommended Mapping Elements

Although not a requirement of the 2017 MS4 Permit, Hudson will include the following recommended elements in its storm system mapping conicding with the Phase II stormwater map:

- Storm sewer material, size (pipe diameter), age
- Sanitary sewer system material, size (pipe diameter), age
- Privately owned stormwater treatment structures
- Where a municipal sanitary sewer system exists, properties known or suspected to be served by a septic system, especially in high density urban areas
- Area where the permittee's MS4 has received or could receive flow from septic system discharges
- Seasonal high water table elevations impacting sanitary alignments
- Topography
- Orthophotography
- Alignments, dates and representation of work completed of past illicit discharge investigations
- Locations of suspected confirmed and corrected illicit discharges with dates and flow estimates.

4 Sanitary Sewer Overflows (SSOs)

The 2017 MS4 Permit requires municipalities to prohibit illicit discharges, including sanitary sewer overflows (SSOs), to the separate storm sewer system. SSOs are discharges of untreated sanitary wastewater from a municipal sanitary sewer that can contaminate surface waters, cause serious water quality problems and property damage, and threaten public health. SSOs can be caused by blockages, line breaks, sewer defects that allow stormwater and groundwater to overload the system, power failures, improper sewer design, and vandalism.

SUMMARY: Within the past five (5) years, the Town of Hudson has not experienced any known SSO occurences within the regulated area. Procedures will remain in place for detection and reporting of SSOs if one should occur.

Upon detection of an SSO, Hudson will eliminate it as expeditiously as possible and take interim measures to minimize the discharge of pollutants to and from its MS4 until the SSO is eliminated. Upon becoming aware of an SSO to the MS4, the Hudson will provide oral notice to EPA within 24 hours and written notice to EPA and NHDES within five (5) days of becoming aware of the SSO occurrence.

An inventory table will be updated by the Town Engineer if new SSOs are detected. The SSO inventory will be included in the annual report, including the status of mitigation and corrective measures to address each identified SSO if applicable.

5 Assessment and Priority Ranking of Outfalls

The 2017 MS4 Permit requires an assessment and priority ranking of outfalls in terms of their potential to have illicit discharges and SSOs and the related public health significance. The ranking helps determine the priority order for performing IDDE investigations and meeting permit milestones.

The Town of Hudson has approximately 490 regulated stormwater outfalls within the MS4 Urbanized Area associated with Town roadways and municipal operations that have been determined to discharge to surface waters or wetland areas.

5.1 Outfall Catchment Delineations

A catchment is the area that drains to an individual outfall[1] or interconnection.[2] The catchments for each of the MS4 outfalls will be delineated to define contributing areas for investigation of potential sources of illicit discharges. Catchments are typically delineated based on topographic contours and mapped drainage infrastructure, where available. As described in **Section 3**, initial catchment delineations will be completed as part of the Phase I mapping, and refined catchment delineations will be completed as part of the Phase II mapping to reflect information collected during catchment investigations

5.2 Outfall and Interconnection Inventory and Initial Ranking

The DPW will complete an initial outfall and interconnection inventory and priority ranking to assess illicit discharge potential based on existing information. The initial inventory and ranking will be completed within one (1) year from the effective date of the permit. An updated inventory and ranking will be provided in each annual report thereafter. The inventory will be updated annually to include data collected in connection with dry weather screening and other relevant inspections.

[1] **Outfall** means a point source as defined by 40 CFR § 122.2 as the point where the municipal separate storm sewer discharges to waters of the United States. An outfall does not include open conveyances connecting two municipal separate storm sewers or pipes, tunnels or other conveyances that connect segments of the same stream or other waters of the United States and that are used to convey waters of the United States. Culverts longer than a simple road crossing shall be included in the inventory unless the permittee can confirm that they are free of any connections and simply convey waters of the United States.

[2] **Interconnection** means the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is conveyed to waters of the United States or to another storm sewer system and eventually to a water of the United States.

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

Outfalls and interconnections will be classified into one of the following categories:

1. **Problem Outfalls**: Outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall include any outfalls/interconnections where previous screening indicates likely sewer input. Likely sewer input indicators are any of the following:
    - Olfactory or visual evidence of sewage,
    - Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
    - Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

    Dry weather screening and sampling, as described in **Section 6** of this IDDE Plan and Part 2.3.4.7.b of the MS4 Permit, is not required for Problem Outfalls.

2. **High Priority Outfalls**: Outfalls/interconnections that have not been classified as Problem Outfalls and that are:
    - Discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds
    - Determined by the permittee as high priority based on the characteristics listed below or other available information.

3. **Low Priority Outfalls**: Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.

4. **Excluded outfalls**: Outfalls/interconnections with no potential for illicit discharges may be excluded from the IDDE program. This category is limited to roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; drainage for athletic fields, parks or undeveloped green space and associated parking without services; cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.

Outfalls will be ranked into the above priority categories (except for excluded outfalls, which may be excluded from the IDDE program) based on the following characteristics of the defined initial catchment areas, where information is available. Additional relevant characteristics, including location-specific characteristics, may be considered but must be documented in this IDDE Plan.

- **Previous screening results** – previous screening/sampling results indicate likely sewer input (see criteria above for Problem Outfalls).

- **Past discharge complaints and reports.**
- **Poor receiving water quality** – the following guidelines are recommended to identify waters as having a high illicit discharge potential:
    - Exceeding water quality standards for bacteria
    - Ammonia levels above 0.5 mg/l
    - Surfactants levels greater than or equal to 0.25 mg/l
- **Density of generating sites** – Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.
- **Age of development and infrastructure** – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a low illicit discharge potential.
- **Sewer conversion** – Contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential.
- **Historic combined sewer systems** – Contributing areas that were once serviced by a combined sewer system, but have been separated may have a high illicit discharge potential.
- **Surrounding density of aging septic systems** – Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
- **Culverted streams** – Any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
- **Water quality limited waterbodies** that receive a discharge from the MS4 or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment.

Table 5-1 Outfall Inventory and Priority Ranking Summary
Revision Date: May 2019

Outfall Priority	# of Outfalls
Problem	0
High Priority	112
Low Priority	278
Excluded	110
Total Outfalls	**490**

6 Dry Weather Outfall Screening and Sampling

Dry weather flow is a common indicator of potential illicit connections. The MS4 Permit requires all outfalls/interconnections (excluding Problem and excluded Outfalls) to be inspected for the presence of dry weather flow. The DPW is responsible for conducting dry weather outfall screening, starting with High Priority outfalls, followed by Low Priority outfalls, based on the initial priority rankings described in the previous section.

6.1 Weather Conditions

Dry weather outfall screening and sampling may occur when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring. For purposes of determining dry weather conditions, DPW staff will use precipitation data available online at Weather Underground (wunderground.com) for three personal weather stations within or closest to Hudson. If any of the three stations document more than 0.1 inches of rainfall in the previous 24-hour period, DPW staff will not count that as a dry weather period.

For purposes of determining dry weather conditions, program staff will use precipitation data from NOAA Station KNHHUDSO23 (Hudson 23) on Bonnie Lane in Hudson, NH . If Hudson 23 Station is not available or not reporting current weather data, then NOAA Station KNHHUDSO6 (Hudson 6) on Highland Street will be used as a back-up. (KNHHUDSO16 station as third backup)

6.2 Dry Weather Screening/Sampling Procedure

6.2.1 General Procedure

The dry weather outfall inspection and sampling procedure consists of the following general steps:

1. Identify outfall(s) to be screened/sampled based on initial outfall inventory and priority ranking
2. Acquire the necessary staff, mapping, and field equipment (see **Table 6-1** for list of potential field equipment)
3. Conduct the outfall inspection during dry weather:
    a. Mark and photograph the outfall
    b. Record inspection information and outfall characteristics (using paper forms or digital form using a tablet or similar device)
    c. Look for and record visual/olfactory evidence of pollutants in flowing outfalls including odor, color, turbidity, and floatable matter (suds, bubbles,

excrement, toilet paper or sanitary products). Also observe outfalls for deposits and stains, vegetation, and damage to outfall structures.

4. **If flow is observed, sample and test the flow following the procedures described in the following sections.**
5. If no flow is observed, but evidence of illicit flow exists (illicit discharges are often intermittent or transitory), revisit the outfall during dry weather within one week of the initial observation, if practicable, to perform a second dry weather screening and sample any observed flow. Other techniques can be used to detect intermittent or transitory flows including conducting inspections during evenings or weekends and using optical brighteners.
6. Input results from screening and sampling into spreadsheet/database. Include pertinent information in the outfall/interconnection inventory and priority ranking.
7. Include all screening data in the annual report.

Previous outfall screening/sampling conducted under the 2003 MS4 Permit may be used to satisfy the dry weather outfall/screening requirements of the 2017 MS4 Permit only if the previous screening and sampling was substantially equivalent to that required by the 2017 MS4 Permit, including the list of analytes outlined in Section 2.3.4.7.b.iii.4 of the 2017 permit.

6.2.2 Field Equipment

Table 6-1 lists field equipment commonly used for dry weather outfall screening and sampling.

Table 6-1. Field Equipment – Dry Weather Outfall Screening and Sampling

Equipment	Use/Notes
Clipboard	For organization of field sheets and writing surface
Field Sheets	Field sheets for both dry weather inspection and Dry weather sampling should be available with extras
Chain of Custody Forms	To ensure proper handling of all samples
Pens/Pencils/Permanent Markers	For proper labeling
Nitrile Gloves	To protect the sampler as well as the sample from contamination
Flashlight/headlamp w/batteries	For looking in outfalls or manholes, helpful in early mornings as well
Cooler with Ice	For transporting samples to the laboratory
Digital Camera	For documenting field conditions at time of inspection
Personal Protective Equipment (PPE)	Reflective vest, Safety glasses and boots at a minimum
GPS Receiver	For taking spatial location data
Water Quality Sonde	If needed, for sampling conductivity, temperature, pH
Water Quality Meter	Hand held meter, if available, for testing for various water quality parameters such as ammonia, surfactants and chlorine

Equipment	Use/Notes
Test Kits	Have extra kits on hand to sample more outfalls than are anticipated to be screened in a single day
Label Tape	For labeling sample containers
Sample Containers	Make sure all sample containers are clean. Keep extra sample containers on hand at all times. Make sure there are proper sample containers for what is being sampled for (i.e., bacteria requires sterile containers).
Pry Bar or Pick	For opening catch basins and manholes when necessary
Sandbags	For damming low flows in order to take samples
Small Mallet or Hammer	Helping to free stuck manhole and catch basin covers
Utility Knife	Multiple uses
Measuring Tape	Measuring distances and depth of flow
Safety Cones	Safety
Hand Sanitizer	Disinfectant/decontaminant
Zip Ties/Duct Tape	For making field repairs
Rubber Boots/Waders	For accessing shallow streams/areas
Sampling Pole/Dipper/Sampling Cage	For accessing hard to reach outfalls and manholes

6.2.3 Sample Collection and Analysis

If flow is present during a dry weather outfall inspection, a sample will be collected and analyzed for the required permit parameters[3] listed in **Table 6-2**. The general procedure for collection of outfall samples is as follows:

1. Fill out all sample information on sample bottles and field sheets
2. Put on protective gloves (nitrile/latex/other) before sampling
3. Collect sample with dipper or directly in sample containers. If possible, collect water from the flow directly in the sample bottle. Be careful not to disturb sediments.
4. If using a dipper or other device, triple rinse the device with distilled water and then in water to be sampled (not for bacteria sampling)
5. Use test strips, test kits, and field meters (rinse similar to dipper) for most parameters (see **Table 6-2**)
6. Place laboratory samples on ice for analysis of bacteria and pollutants of concern
7. Fill out chain-of-custody form for laboratory samples
8. Deliver samples to Absolute Resource Associates
9. Dispose of used test strips and test kit ampules properly
10. Decontaminate all testing personnel and equipment

[3] Other potentially useful parameters, although not required by the MS4 Permit, include **fluoride** (indicator of potable water sources in areas where water supplies are fluoridated), **potassium** (high levels may indicate the presence of sanitary wastewater), and **optical brighteners** (indicative of laundry detergents).

In the event that an outfall is submerged, either partially or completely, or inaccessible, field staff will proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results. Field staff will continue to the next upstream structure until there is no longer an influence from the receiving water on the visual inspection or sampling.

Field test kits or field instrumentation are permitted for all parameters except indicator bacteria and any pollutants of concern. Field kits need to have appropriate detection limits and ranges. **Table 6-2** lists various field test kits and field instruments that can be used for outfall sampling associated with the 2017 MS4 Permit parameters, other than indicator bacteria and any pollutants of concern. Analytic procedures and user's manuals for field test kits and field instrumentation can be found at the manufacturer's website.

Table 6-2. Sampling Parameters and Analysis Methods

Analyte or Parameter	Instrumentation (Portable Meter)	Field Test Kit
Ammonia	CHEMetrics™ V-2000 Colorimeter Hach™ DR/890 Colorimeter Hach™ Pocket Colorimeter™ II	CHEMetrics™ K-1410 CHEMetrics™ K-1510 (series) Hach™ NI-SA Hach™ Ammonia Test Strips
Surfactants (Detergents)	CHEMetrics™ I-2017	CHEMetrics™ K-9400 and K-9404 Hach™ DE-2
Chlorine	CHEMetrics™ V-2000, K-2513 Hach™ Pocket Colorimeter™ II	NA
Conductivity	CHEMetrics™ I-1200 YSI Pro30 YSI EC300A Oakton 450	NA
Temperature	YSI Pro30 YSI EC300A Oakton 450	NA
Salinity	YSI Pro30 YSI EC300A Oakton 450	NA
Temperature	YSI Pro30 YSI EC300A Oakton 450	NA
Indicator Bacteria: *E. coli* (freshwater) or Enterococcus (saline water)	EPA certified laboratory procedure (40 CFR § 136)	NA
Pollutants of Concern[1]	EPA certified laboratory procedure (40 CFR § 136)	NA

[1] Where the discharge is directly into a water quality limited water or a water subject to an approved TMDL, the sample must be analyzed for the pollutant(s) of concern identified as the cause of the water quality impairment.

Testing for indicator bacteria and any pollutants of concern must be conducted using analytical methods and procedures found in 40 CFR § 136.[4] Samples for laboratory analysis must also be stored and preserved in accordance with procedures found in 40 CFR § 136. **Table 6-3** lists analytical methods, detection limits, hold times, and preservatives for laboratory analysis of dry weather sampling parameters.

Table 6-3. Required Analytical Methods, Detection Limits, Hold Times, and Preservatives[4]

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Ammonia	**EPA**: 350.2, **SM**: 4500-NH3C	0.05 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2, No preservative required if analyzed immediately
Surfactants	**SM**: 5540-C	0.01 mg/L	48 hours	Cool ≤6°C
Chlorine	**SM**: 4500-Cl G	0.02 mg/L	Analyze within 15 minutes	None Required
Temperature	**SM**: 2550B	*NA*	Immediate	None Required
Specific Conductance	**EPA**: 120.1, **SM**: 2510B	0.2 µs/cm	28 days	Cool ≤6°C
Salinity	**SM**: 2520	-	28 days	Cool ≤6°C
Indicator Bacteria: *E.coli* Enterococcus	*E.coli* **EPA**: 1603 **SM**: 9221B, 9221F , 9223 B **Other**: Colilert ®, Colilert-18® *Enterococcus* **EPA**: 1600 **SM**: 9230 C **Other**: Enterolert®	*E.coli* **EPA**: 1 cfu/100mL **SM**: 2 MPN/100mL **Other**: 1 MPN/100mL *Enterococcus* **EPA**: 1 cfu/100mL **SM**: 1 MPN/100mL **Other**: 1 MPN/100mL	8 hours	Cool ≤10°C, 0.0008% $Na_2S_2O_3$
Total Phosphorus	**EPA**: Manual-365.3, Automated Ascorbic acid digestion-365.1 Rev. 2, ICP/AES4-200.7 Rev. 4.4 **SM**: 4500-P E-F	**EPA**: 0.01 mg/L **SM** : 0.01 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2
Total Nitrogen (Ammonia +	**EPA**: Cadmium reduction (automated)-	**EPA**: 0.05 mg/L **SM** : 0.05 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2

[4] 40 CFR § 136: http://www.ecfr.gov/cgi-bin/text-idx?SID=b3b41fdea0b7b0b8cd6c4304d86271b7&mc=true&node=pt40.25.136&rgn=div5

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Nitrate/Nitrite, methods are for Nitrate-Nitrite and need to be combined with Ammonia listed above.)	353.2 Rev. 2.0, **SM**: 4500-NO_3 E-F			

SM = Standard Methods

6.2.4 Interpreting Outfall Sampling Results

Outfall analytical data from dry weather sampling can be used to help identify the major type or source of discharge. **Table 6-4** shows values identified by the U.S. EPA and the Center for Watershed Protection as typical screening values for select parameters. These represent the typical concentration (or value) of each parameter expected to be found in stormwater. **Screening values that exceed these benchmarks may be indicative of pollution and/or illicit discharges.**

Table 6-4. Benchmark Field Measurements for Select Parameters

Analyte or Parameter	Benchmark
Ammonia	>0.5 mg/L
Conductivity	>2,000 µS/cm
Surfactants	>0.25 mg/L
Chlorine	>0.02 mg/L (detectable levels per the 2017 MS4 Permit)
Indicator Bacteria[5]: *E.coli* *Enterococcus*[6]	*E.coli*: the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 126 colonies per 100 ml and no single sample taken during the bathing season shall exceed 235 colonies per 100 ml *Enterococcus:* the geometric mean of the three most recent samples taken during a 60-day period shall not exceed 35 colonies per 100 ml and no single sample taken during the bathing season shall exceed 104 colonies per 100 ml

6.3 Follow-up Ranking of Outfalls and Interconnections

Hudson will update and re-prioritize the initial outfall and interconnection rankings based on information gathered during dry weather screening. The rankings will be updated periodically as dry weather screening information becomes available, but will be completed within three (3) years of the effective date of the permit (by July 1, 2021).

Outfalls/interconnections where relevant information was found indicating sewer input to the MS4 or sampling results indicating sewer input are highly likely to contain illicit discharges from sanitary sources.
Such outfalls/interconnections will be ranked at the top of the High Priority Outfalls category for investigation. Other outfalls and interconnections may be re-ranked based on

[5] EPA Illicit Discharge Detection and Elimination: A Guidance Manual: https://www3.epa.gov/npdes/pubs/idde_chapter-12.pdf
[6] NHDES Water Division: https://www.des.nh.gov/organization/divisions/water/wmb/beaches/faq_advisories.htm

any new information from the dry weather screening.

7 Catchment Investigations

Once stormwater outfalls with evidence of illicit discharges have been identified, various methods can be used to trace the source of the potential discharge within the outfall catchment area. Catchment investigation techniques include but are not limited to review of maps, historic plans, and records; manhole observation; dry and wet weather sampling; video inspection; smoke testing; and dye testing. This section outlines a systematic procedure to investigate outfall catchments to trace the source of potential illicit discharges. All data collected as part of the catchment investigations will be recorded and reported in each annual report.

7.1 System Vulnerability Factors

The DPW will review relevant mapping and historic plans and records to identify areas within the catchment with higher potential for illicit connections. The following information will be reviewed:

- Plans related to the construction of the drainage network
- Plans related to the construction of the sewer drainage network
- Prior work on storm drains or sewer lines
- Board of Health or other municipal data on septic systems
- Complaint records related to SSOs
- Septic system breakouts.

Based on the review of this information, the presence of any of the following **System Vulnerability Factors (SVFs)** will be identified for each catchment:

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
- Common or twin-invert manholes serving storm and sanitary sewer alignments
- Common trench construction serving both storm and sanitary sewer alignments
- Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system
- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system
- Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints
- Areas formerly served by combined sewer systems
- Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through

Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations

- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs
- Any sanitary sewer and storm drain infrastructure greater than 40 years old
- Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather that poor owner maintenance)
- History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather that poor owner maintenance).

A SVF inventory will be documented for each catchment (see **Table 7-1**), retained as part of this IDDE Plan, and included in the annual report.

Table 7-1. Outfall Catchment System Vulnerability Factor (SVF) Inventory
Hudson, New Hampshire
Revision Date: ##DATE OF LAST UPDATE

Outfall ID	Receiving Water	1 History of SSOs	2 Common or Twin Invert Manholes	3 Common Trench Construction	4 Storm/Sanitary Crossings (Sanitary Above)	5 Sanitary Lines with Underdrains	6 Inadequate Sanitary Level of Service	7 Areas Formerly Served by Combined Sewers	8 Sanitary Infrastructure Defects	9 SSO Potential In Event of System Failures	10 Sanitary and Storm Drain Infrastructure >40 years Old	11 Septic with Poor Soils or Water Table Separation	12 History of BOH Actions Addressing Septic Failure
Sample 1	XYZ River	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Presence/Absence Evaluation Criteria:

1. History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
2. Common or twin-invert manholes serving storm and sanitary sewer alignments
3. Common trench construction serving both storm and sanitary sewer alignments
4. Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system
5. Sanitary sewer alignments known or suspected to have been constructed with an underdrain system
6. Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints
7. Areas formerly served by combined sewer systems
8. Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations
9. Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs
10. Any sanitary sewer and storm drain infrastructure greater than 40 years old
11. Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather that poor owner maintenance)
12. History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather that poor owner maintenance)

7.2 Dry Weather Manhole Inspections

Hudson will implement a dry weather storm drain network investigation that involves systematically and progressively observing, sampling and evaluating key junction manholes in the MS4 to determine the approximate location of suspected illicit discharges or SSOs.

The DPW will be responsible for implementing the dry weather manhole inspection program and making updates as necessary. Infrastructure information will be incorporated into the storm system map, and catchment delineations will be refined based on the field investigation, where necessary. The SVF inventory will also be updated based on information obtained during the field investigations, where necessary.

Several important terms related to the dry weather manhole inspection program are defined by the MS4 Permit as follows:

- **Junction Manhole** is a manhole or structure with two or more inlets accepting flow from two or more MS4 alignments. Manholes with inlets solely from private storm drains, individual catch basins, or both are not considered junction manholes for these purposes.

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

For all catchments identified for investigation, during dry weather, field crews will systematically inspect **key junction manholes** for evidence of illicit discharges. This program involves progressive inspection and sampling at manholes in the storm drain network to isolate and eliminate illicit discharges.

The manhole inspection methodology will be conducted in one of two ways (or a combination of both):

- By working progressively up from the outfall and inspecting key junction manholes along the way, or
- By working progressively down from the upper parts of the catchment toward the outfall.

For most catchments, manhole inspections will proceed from the outfall moving up into the system.

However, the decision to move up or down the system depends on the nature of the drainage system and the surrounding land use and the availability of information on the catchment and drainage system. Moving up the system can begin immediately when an illicit discharge is detected at an outfall, and only a map of the storm drain system is required. Moving down the system requires more advance preparation and reliable drainage system information on the upstream segments of the storm drain system, but may be more efficient if the sources of illicit discharges are believed to be located in the upstream portions of the catchment area. Once a manhole inspection methodology has been selected, investigations will continue systematically through the catchment.

Inspection of key junction manholes will proceed as follows:

1. Manholes will be opened and inspected for visual and olfactory evidence of illicit connections.

2. If flow is observed, a sample will be collected and analyzed at a minimum for ammonia, chlorine, and surfactants. Field kits can be used for these analyses. Sampling and analysis will be in accordance with procedures outlined in **Section 6**. Additional indicator sampling may assist in determining potential sources (e.g., bacteria for sanitary flows, conductivity to detect tidal backwater, etc.).

3. Where sampling results or visual or olfactory evidence indicate potential illicit discharges or SSOs, the area draining to the junction manhole will be flagged for further upstream manhole investigation and/or isolation and confirmation of sources.

4. Subsequent key junction manhole inspections will proceed until the location of suspected illicit discharges or SSOs can be isolated to a pipe segment between two manholes.

5. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completion of key junction manhole sampling.

7.3 Wet Weather Outfall Sampling

Where a minimum of one (1) System Vulnerability Factor (SVF) is identified based on previous information or the catchment investigation, a wet weather investigation must also be conducted at the associated outfall. The DPW will be responsible for implementing the wet weather outfall sampling program and making updates as necessary.

Outfalls will be inspected and sampled under wet weather conditions, to the extent necessary, to determine whether wet weather-induced high flows in sanitary sewers or high groundwater in areas served by septic systems result in discharges of sanitary flow to the MS4.

Wet weather outfall sampling will proceed as follows:

1. At least one wet weather sample will be collected at the outfall for the same parameters required during dry weather screening.

2. Wet weather sampling will occur during or after a storm event of sufficient depth or intensity to produce a stormwater discharge at the outfall. There is no specific rainfall amount that will trigger sampling, although minimum storm event intensities that are likely to trigger sanitary sewer interconnections are preferred. To the extent feasible, sampling should occur during the spring (March through June) when groundwater levels are relatively high.

3. If wet weather outfall sampling indicates a potential illicit discharge, then additional wet weather source sampling will be performed, as warranted, or source isolation and confirmation procedures will be followed as described in **Section 7.4**.

4. If wet weather outfall sampling does not identify evidence of illicit discharges, and no evidence of an illicit discharge is found during dry weather manhole inspections, catchment investigations will be considered complete.

7.4 Source Isolation and Confirmation

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

- Sandbagging
- Smoke Testing
- Dye Testing
- CCTV/Video Inspections
- Optical Brightener Monitoring
- IDDE Canines

These methods are described in the sections below.

Public notification is an important aspect of a detailed source investigation program. Prior to smoke testing, dye testing, or TV inspections, the DPW will notify property owners in the affected area. Smoke testing notification will include notification for single family homes, businesses and building lobbies for multi-family dwellings in the form of Robocalls, door hangers, and/or personal notifications.

7.4.1 Sandbagging

This technique can be particularly useful when attempting to isolate intermittent illicit discharges or those with very little perceptible flow. The technique involves placing sandbags or similar barriers (e.g., caulking, weirs/plates, or other temporary barriers) within outlets to manholes to form a temporary dam that collects any intermittent flows that may occur. Sandbags are typically left in place for 48 hours, and should only be installed when dry weather is forecast. If flow has collected behind the sandbags/barriers after 48 hours it can be assessed using visual observations or by sampling. If no flow collects behind the sandbag, the upstream pipe network can be ruled out as a source of the intermittent discharge. Finding appropriate durations of dry weather and the need for multiple trips to each manhole makes this method both time-consuming and somewhat limiting.

7.4.2 Smoke Testing

Smoke testing involves injecting non-toxic smoke into drain lines and noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the system itself. Typically, a smoke bomb or smoke generator is used to inject the smoke into the system at a catch basin or manhole and air is then forced through the system. Test personnel are place in areas where there are suspected illegal connections or cracks/leaks, noting any escape of smoke (indicating an illicit connection or damaged storm drain infrastructure). It is important when using this technique to make proper notifications to area residents and business owners as well as local police and fire departments.

If the initial test of the storm drain system is unsuccessful then a more thorough smoke-test of the sanitary sewer lines can also be performed. Unlike storm drain smoke tests, buildings that do not emit smoke during sanitary sewer smoke tests may have problem connections and may also have sewer gas venting inside, which is hazardous.

It should be noted that smoke may cause minor irritation of respiratory passages. Residents with respiratory conditions may need to be monitored or evacuated from the area of testing altogether to ensure safety during testing.

7.4.3 Dye Testing

Dye testing involves flushing non-toxic dye into plumbing fixtures such as toilets, showers, and sinks and observing nearby storm drains and sewer manholes as well as stormwater outfalls for the presence of the dye. Similar to smoke testing, it is important to inform local residents and business owners. Police, fire, and local public health staff should also be notified prior to testing in preparation of responding to citizen phone calls concerning the dye and their presence in local surface waters.

A team of two or more people is needed to perform dye testing (ideally, all with two-way radios). One person is inside the building, while the others are stationed at the appropriate storm sewer and sanitary sewer manholes (which should be opened) and/or outfalls. The person inside the building adds dye into a plumbing fixture (i.e., toilet or sink) and runs a sufficient amount of water to move the dye through the plumbing system. The person inside the building then radios to the outside crew that the dye has been dropped, and the outside crew watches for the dye in the storm sewer and sanitary sewer, recording the presence or absence of the dye.

The test can be relatively quick (about 30 minutes per test), effective (results are usually definitive), and inexpensive. Dye testing is best used when the likely source of an illicit discharge has been narrowed down to a few specific houses or businesses.

7.4.4 CCTV/Video Inspection

Another method of source isolation involves the use of mobile video cameras that are guided remotely through stormwater drain lines to observe possible illicit discharges. IDDE program staff can review the videos and note any visible illicit discharges. While this tool is both effective and usually definitive, it can be costly and time consuming when compared to other source isolation techniques.

7.4.5 Optical Brightener Monitoring

Optical brighteners are fluorescent dyes that are used in detergents and paper products to enhance their appearance. The presence of optical brighteners in surface waters or dry weather discharges suggests there is a possible illicit discharge or insufficient removal through adsorption in nearby septic systems or wastewater treatment. Optical brightener monitoring can be done in two ways. The most common, and least expensive, methodology involves placing a cotton pad in a wire cage and securing it in a pipe, manhole, catch basin, or inlet to capture intermittent dry weather flows. The pad is retrieved at a later date and placed under UV light to determine the presence/absence of brighteners during the monitoring period. A second methodology uses handheld fluorometers to detect optical brighteners in water sample collected from outfalls or ambient surface waters. Use of a fluorometer, while more quantitative, is typically more costly and is not as effective at isolating intermittent discharges as other source isolation techniques.

7.5 Illicit Discharge Removal

When the specific source of an illicit discharge is identified, Hudson will exercise its authority as necessary to require its removal. The annual report will include the status of IDDE investigation and removal activities including the following information for each confirmed source:

- The location of the discharge and its source(s)

- A description of the discharge
- The method of discovery
- Date of discovery
- Date of elimination, mitigation or enforcement action OR planned corrective measures and a schedule for completing the illicit discharge removal
- Estimate of the volume of flow removed.

7.5.1 Confirmatory Outfall Screening

Within one (1) year of removal of all identified illicit discharges within a catchment area, confirmatory outfall or interconnection screening will be conducted. The confirmatory screening will be conducted in dry weather unless System Vulnerability Factors have been identified, in which case both dry weather and wet weather confirmatory screening will be conducted. If confirmatory screening indicates evidence of additional illicit discharges, the catchment will be scheduled for additional investigation.

7.6 Ongoing Screening

Upon completion of all catchment investigations and illicit discharge removal and confirmation (if necessary), each outfall or interconnection will be re-prioritized for screening and scheduled for ongoing screening once every five (5) years. Ongoing screening will consist of dry weather screening and sampling consistent with the procedures described in **Section 6** of this plan. Ongoing wet weather screening and sampling will also be conducted at outfalls where wet weather screening was required due to System Vulnerability Factors and will be conducted in accordance with the procedures described in **Section 7.3**. All sampling results will be reported in the annual report.

8 Training

Annual IDDE training will be made available to all employees involved in the IDDE program. This training will at a minimum include information on how to identify illicit discharges and SSOs and may also include additional training specific to the functions of particular personnel and their function within the framework of the IDDE program. Training records will be maintained in **Appendix H** of the SWMP. The frequency and type of training will be included in the annual report.

9 Progress Reporting

The progress and success of the IDDE program will be evaluated on an annual basis. The evaluation will be documented in the annual report and will include the following indicators of program progress:

- Number of SSOs and illicit discharges identified and removed
- Number and percent of total outfall catchments served by the MS4 evaluated using the catchment investigation procedure
- Number of dry weather outfall inspections/screenings
- Number of wet weather outfall inspections/sampling events
- Number of enforcement notices issued
- All dry weather and wet weather screening and sampling results
- Estimate of the volume of sewage removed, as applicable
- Number of employees trained annually.

The success of the IDDE program will be measured by the IDDE activities completed within the required permit timelines.

Appendix E

IDDE Inspection Results and Data (placeholder)

Appendix F

DRAFT Operations and Maintenance (O&M) Plan

Municipal Facilities Operations & Maintenance (O&M) Plan

The Town of Hudson

12 School Street, Hudson, New Hampshire 03051

EPA NPDES Permit Number *NHR041013*

Rev. November 2020

Due to the disruption caused by the Covid19 virus pandemic, completion of this O&M Plan is still a work in progress but it is anticipated to be completed in the 1st half of 2022 or at the very least by the end of the Year 4 (June 2022) disruptions.

Town of Hudson Operations and Maintenance (O&M) Plan

MCM 6: Goal

Consistent with Part 2.3.7 of the 2017 MS4 Permit, the overall goal is to develop an operations and maintenance program that emphasizes source control and minimizes the potential for pollutants to be exposed and transported by stormwater runoff into nearby water bodies from the Town's roadways, facilities and maintenance activities, as well as maintain the functional integrity of the stormwater infrastructure system.

Compliance with Regulatory Requirements

Section 2.3.7 of the 2017 New Hampshire National Pollution Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit requires the Town to develop an Operations and Maintenance (O&M) Plan to describe its Good Housekeeping and Pollution Prevention measures consistent with the requirements of Minimum Control Measure (MCM) 6.

This O&M Plan includes an inventory of Town-owned facilities (e.g., roadways, buildings, parks and recreational facilities, vehicle maintenance, waste handling and disposal facilities) in the urbanized area. This O&M Plan also describes specific protocols and practices to maintain its facilities including buildings and grounds, vehicles, parks and open spaces and in performing good housekeeping and pollution prevention measures at its facilities.

The Permit identifies principal best management practices (BMPs) for permittee-owned facilities or activities that should be included in the O&M Plan, these include:

a) Parks and Open Spaces

b) Buildings and Facilities

c) Vehicle/Equipment Storage and Maintenance Facilities

d) Stormwater Infrastructure (e.g., catch basins, outfalls and treatment BMPs)

e) Winter Road Maintenance

f) Pesticide, Fertilizer and Herbicide Storage, Use and Disposal

The following section describes the various Operations and Maintenance (O&M) practices for Town-owned buildings, recreational facilities and stormwater infrastructure including street sweeping, catch basin cleaning and stormwater BMP maintenance consistent with permit requirements. Review and an assessment of needs for measures conducted at School facilities will also need to be done as part of this process.

Responsible Department/Parties: Department of Public Works/ Engineering

BMP-1 Parks and Open Space

Table 6.1 provides an inventory and a listing of relevant activities at Town-owned parks, ball fields and open space areas.

Table 6-1: Inventory of Parks and Open Spaces

Parks / Ball Fields / Open Space	Managed Turf	Fertilizer / Pesticide[1]	Sanitary Services	Dogs Allowed	Dog Waste Station
Freedom Field II	Yes	Yes	Yes	Yes	No
Greeley Street Park	Yes	Yes	Yes	Yes	No
Jette Field / Sousa Field	Yes	Yes	Yes	Yes	No
Merrill Park	Yes	Yes	No	Yes	No
Merrifield Park	Yes	Yes	Yes	Yes	No
Bensons Park	Yes	Yes	Yes	Yes	Yes2
Library Park (Town Commons)	Yes	Yes	No	Yes	No
Hudson Center (by Cahills)	Yes	Yes	No	Yes	No
Hammond Park (Lowell Rd)	Yes	Yes	No	Yes	No
Musquash Conservation Land	N/A	N/A	No	Yes	No
Melendy Rd Pickle Ball Courts	Yes	Yes	No	Yes	No
Robinson Pond Beach	N/A	N/A	????	No Dogs in Beach area	No
Cemeteries					
Blodgett (South Cemetery)	Yes	N/A	N/A	Yes	No
Ford Burial Grounds	Yes	N/A	N/A	Yes	No
Sentor Burial Grounds (Old Derry Rd)	Yes	N/A	N/A	Yes	No
Poor Farm (Twin Meadow Dr)	Yes	N/A	N/A	Yes	No
Sunnyside (98 Central Street)	Yes	N/A	N/A	Yes	No

Notes: [1]Fertilizer and pesticides are only applied on a as needed basis. [2]Benson Park currently has a dog waste station

Best Practices

Lawn Maintenance/Landscaping

The following are best practices used for lawn maintenance at Town-owned facilities.

- Maintain a grass height of 3 inches for Town-owned lawn areasLeave grass clippings in place using a mulching mowing blade or dispose clippings in the yard waste pile at West Road Transfer Station
- Grass clippings should not be dispersed or blown into roads or other paved areas.
- Mowing patterns should vary to prevent ruts and promote even growth

Yard Waste and Leaf Litter

- The Town Transfer Station on West Rd. is open every Saturday from April to November to allow Residents to dispose of yard waste in the compost pile.
- The Town provides curb side pickup of yard waste and leaf litter once per year in the last Saturday of November.

Pesticides, Herbicides, and Fertilizers

Use and storage of lawn maintenance chemicals is done only on an as needed basis and is limited to the following chemicals:

Table 6-2: Inventory of Lawn Maintenance Chemicals

Chemical	Use	Storage Location	Disposal
Lesco Dimension 0.21% plus Fertilizer	Crabgrass control	Not stored: Purchased day of use	Unused product is brought to Transfer station for proper disposal
Lesco Slow Release Fertilizer	Root Growth	Transfer Station Building West Road	Unused product is brought to Transfer Station for proper disposal
Criterion 2F Insecticide	Grub/Insect Control	Not stored in facility purchased day of use	Unused product is brought to Transfer Station for proper disposal

Trash Container Management

Trash receptacles are frequently maintained and emptied to help control fugitive litter and debris.

- Trash cans and/or dumpsters are located at many park locations listed above.
- Additional trash cans or other necessary equipment will be ordered by Director of Public Works based on the results of park inspections.
- Trash receptacles at Town facilities are also emptied on a weekly basis during much of the year and less frequently during the colder season months.

Pet Waste

Pet waste left uncollected can be a source of bacteria and nutrients. When pet waste is washed off by stormwater and enters surface waters it can release nutrients and promote algal growth, which depletes oxygen levels and can harm aquatic species.

- Pet waste receptacles and/or bags are located at various park locations listed above
- Emptying waste and refilling bag stations will occur on a bi-weekly basis coinciding with the trash container management schedule

Waterfowl Congregation

Like pet waste, waterfowl droppings can be a significant source of bacteria and nutrients for adjacent surface waters. The DPW continues to explore various measures to deter waterfowl congregation within Benson's Park, around Otternick Pond, and Robinson Pond.

The Town has used many conventional waterfowl grazing deterrents around open water bodies in Town parks with limited success. If waterfowl congregation remains an issue in Hudson, the Town's DPW will explore other methods for deterring or removing waterfowl.

BMP 6-2: Building and Facilities

Consistent with Section 2.3.7.1(b) of the MS4 Permit, Table 6.3 provides an inventory of Town-owned buildings and facilities that may use, store and/or dispose of petroleum products or other chemicals be evaluated to determine that practices are in place to minimize exposure of these products/chemicals to stormwater. Buildings and facilities include town offices, fire and police stations, schools, library, municipal pools and parking garages.

Table 6-3: Facility Inventory

Facility Name	Outdoor Fuel or Chemical Storage	Vehicle Maint. / Washing	Outdoor Bulk Materials	Managed Turf	Fertilizer/ Pesticide	Dogs Allowed
Public Works Garage	Gas / Diesel (AST)	Yes	Salt/ Sand, MgCl, RAP, Mulch	Yes	Yes	Yes
Melendy Rd Storage Garage	N/A	N/A	N/A	N/A	N/A	N/A
West Road Transfer Station	N/A	N/A	Sand, Gravel, RAP, Loam, LRS	N/A	N/A	N/A
West Road Closed Landfill	N/A	N/A	N/A	Yes	No	Yes
Town Hall	Gasoline (AST)	N/A	N/A	Yes	Yes	Yes
Senior Center	N/A	N/A	N/A	N/A	N/A	Yes
Police Station	N/A	Yes	N/A	Yes	Yes	Yes
Central Fire Station	N/A	Yes	N/A	Yes	No	Yes
South Fire Station	N/A	Yes	N/A	Yes	No	Yes
Robinson Road Fire Station	N/A	Yes	N/A	Yes	No	Yes
Bush Hill Road Fire Station	N/A	Yes	N/A	Yes	No	Yes
Rodgers Memorial Library	N/A	N/A	N/A	Yes[1]	No	Yes
Hills Library	N/A	N/A	N/A	Yes[1]	No	Yes
Recreation Center – Community Center	N/A	N/A	N/A	N/A	N/A	N/A
School Facilities						
Alvrine High School	No	Yes	Salt/Sand	Yes	Yes	No
Memorial Middle School	No	No	No	Yes	Yes	No
Hills Garrison School	No	No	No	Yes	Yes	No
Nottingham West School	No	No	No	Yes	Yes	No
H.O. Smith School	No	No	No	Yes	Yes	No
Library Street School	No	No	No	Yes	No	No
SAU District Office	No	No	No	Yes	No	No

[1] **Turf Maintenance is performed by a private contractor**

Best Practices

Handling, Storage, Transfer, and Disposal of Trash and Recyclables

The Town generally uses the following Best Practices for hauling, storage, transfer and disposal of trash and recyclable procedures to reduce discharge of pollutants from the MS4 areas.

- All liquid and solid waste must be disposed of properly. Some of the most common sources of pollution at municipal facilities are a result of littering, improper collection of debris, and improper disposal of solid or liquid waste.
- All waste and recycling receptacles must be leak-tight with tight-fitting lids or covers.
- Keep lids on dumpsters and containers closed at all times unless adding or removing material. If using an open-top roll-off dumpster, cover it and tie it down with a tarp unless adding materials.
- Place waste or recycling receptacles indoors or under a roof or overhang whenever possible.
- Locate dumpsters on a flat, paved surface and install berms or curbs around the storage area to prevent run-on and run-off.
- Do not locate dumpsters over or adjacent to catch basins.
- Prior to transporting waste, trash, or recycling, ensure that containers are not leaking (double bag if needed) and properly secure containers to the vehicle.
- Clean and sweep up around outdoor waste containers regularly.
- Clean up any liquid leaks or spills with dry cleanup methods.
- Arrange for waste or recycling to be picked up regularly and disposed of at approved disposal facilities.
- Never place hazardous materials, liquids, or liquid-containing wastes in a dumpster or recycling or trash container.
- Do not wash trash or recycling containers outdoors or in parking lots.
- Conduct periodic inspections of solid and liquid waste storage areas to check for leaks and spills.
- Conduct periodic inspections of work areas to ensure that all wastes are being disposed of properly.
- In dumpster areas, regularly pick up surrounding trash and debris and regularly sweep the area.

BMP 6-3: Vehicles and Equipment

The Town has two vehicle fueling stations: one located at the DPW Facility and one located in the rear of the Town Hall. Both stations have spill response kits to contain and respond to an inadvertent spill and prevent the discharge of petroleum-based products to surface waters. The following summarizes the Best Practices for good housekeeping and pollution prevention measures at fueling stations as well as for other vehicle maintenance activities:

Best Practices

Fueling Areas

- Dispensing nozzles are equipped with automatic shut valves
- Access to the fuel pumps is controlled by locking mechanism to prevent unauthorized use
- The DPW recently updated their Spill Prevention Control and Countermeasure (SPCC) Plan for the petroleum storage tanks at the DPW facility.
- DPW personnel periodically inspect spill response kits near the fueling stations to ensure that spill kits are available to respond any inadvertent spills or leaks.
- At the DPW Facility, vehicle fuel is stored double-wall, steel above-ground tanks (ASTs) equipped with level gauges, overfill spill protection and an interstitial space leak detector/ alarm to notify of any internal tank leaks.
- At the Town Hall Facility, vehicle fuel is stored an above-ground double-wall, steel tank (AST) equipped with a level gauge.

Vehicle Maintenance

- Vehicle and equipment maintenance is done indoors within the DPW Facility.

Vehicle Washing

Vehicle washing is generally done in a manner to minimize and avoid direct discharge rinse water into the storm drain system. Rinse water is directed to vegetated areas that are not directly adjacent to surface water bodies.

- Outdoor washing of DPW vehicles is done in designated areas that limits or prevents wash water from going directly into the storm drain system.
- Biodegradable detergents are occasionally used on as needed basis.
- Police vehicles are either washed at commercial facilities or in their own garage facility which has floor drains that are connected to municipal sewer.
- The Fire Department either washes its vehicles indoors that also has floor drains connected to the sanitary sewer or occasionally washes vehicles outdoors.

Stormwater Infrastructure

BMP 6-4: Street/Parking Lot Sweeping

Streets and municipal parking lots with catch basins and/or curbing are swept at least once per year, commencing in the early Spring months. In areas draining to phosphorus impaired waters the sweeping frequency will be increased to twice per year during the Spring and Fall.

- Schedule:
  - Town accepted streets and parking lots with curbing and/or catch basins are swept a minimum of once per year typically scheduled for the spring (April-May).
  - The Town has approximately 30 miles of curbed roadway mostly within the central portion of Town. These roads are swept more than once each year.
  - Road segments draining to phosphorus-impaired water bodies will be identified as part of the pending Robinson Pond Phosphorus Control Plan of the Operations and Maintenance Plan.

- Tracking and Reporting
  - Street sweeping locations are currently tracked via a daily paper log that is entered in an Excel spread sheet at the end of each sweeping activity.
  - ***In 2019, the DPW swept approximately 140 lane-miles of roadway and removed approximately 347 cubic yards of material from swept areas.***

BMP 6-5: Catch Basin Cleaning

Catch basins within the Town are currently cleaned on a rotaitng basis by DPW personnel year-round, primarily during the Spring through Fall seasons. The Town will prioritize inspection and cleaning of catch basins connected to outfalls discharging to Phosphorus impaired surface waters.

- Schedule:
  - Catch basin will be cleaned and inspected such that no more than 50% of the sump will be filled at any time.
  - Catch basins in high-use areas will be evaluated for more frequent cleanings.

- Tracking and Reporting
  - Catch basin inspection and cleaning is tracked and recorded using a tablet and GPS mobile data collector platform and stored in an online Geodatabase.
  - ***In 2019, 107 catch basins were inspected and cleaned with 50 cu yds of material removed and disposed of at the West Road transfer station.***
  - ***In 2019, Catch basin cleaning focused on several major Town roads including A street, Beechwood Road, Burn Hill Road, Hazelwood Road, Rangers Drive, Regina Ave, Ricky Drive and Roy Drive.***

BMP 6-6: Stormwater Treatment BMPs

There are approximately 30 stormwater treatment BMPs associated with Town-maintained roadways and parking lots. These stormwater BMPs are currently inspected on a rotating basis and maintained on an as needed basis to reduce clogging and excessive vegetation. The following lists the various stormwater BMPs that are under DPW's jurisdiction for maintenance. DPW's inspection checklist to document inspection and maintenance activities is included in **Attachment C.**

Listing of Town-Owned Stormwater BMPs by Location and Type

BMP ID No	BMP Type	Street Address	Est. Size (sq. ft)	Date of Last Maintenance
1	Detention Basin	2 Hummingbird Lane	2,500	September 2020
2	Detention Basin	Sousa Blvd (powerlines)	16,000	September 2020
3	Detention Basin	67 Sousa Blvd (by house 67)	5,000	September 2020
4	Detention Basin	9 Breakneck Road	1,500	November 2020
5	Detention Basin	9 Serenity Circle	5,400	September 2020
6	Detention Basin	4 Granite Hill Road	1,800	May 2020
7	Detention Basin	Kara Crossing Drive	1,000	November 2020
8	Detention Basin	11 Kara Crossing Drive	5,500	November 2020
9	Detention Basin	23 Shoreline Drive	21,000	September 2020
10	Detention Basin	4 Sir Isaac	4,000	Feb. 2020
11	Detention Basin	11 Gabrielle Drive	10,000	September 2020
12	Detention Basin	Empire Circle	8,000	
13	Detention Basin	7 Paula Drive	5,000	October 2020
14	Detention Basin	35 Copeland Dr	4,567	
15	Detention Basin	46 Derry Rd (under power lines)	41,100	September 2020
16	Detention Basin	63 Derry Rd (Nellie Court)	2,370	
17	Detention Basin	76 Derry Rd	33,594	
18	Underground Filtration/ Infiltration Basin	12 Hudson Hills Dr	3,184	September 2020
19	Detention Basin	19 Kimball Hill Rd	959	
20	Detention Basin	22 Allyson Dr	12,614	November 2020
21	Detention Basin	2 Rangers Drive	4,700	
22	Detention Basin	13 Rangers Drive	9,375	
23	Detention Basin	49 Rangers Drive	72,000	November 2020
24	Detention Basin	12 Copper Hill Road	4,200	October 2020
25	Detention Basin	10 Sunshine Drive	4,500	October 2020
25	Detention Basin	51 Flying Rock Drive		October 2020
26	Detention Basin	10 Leaor Drive	2,700	October 2020
27	Detention Basin	Sheffield Circle		
28	Detention Basin	50 Moose Hill Road	15,000	November 2020
29	Underground Treatment System (Vortechs System)	34 Webster Street		September 2020

Maintenance Procedures for Stormwater BMPs

Extended 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 reducing local and downstream flooding. Pretreatment is required to reduce the

potential for overflow clogging. The outflow may be designed as either a single or multi-stage. Additional nutrient removal may be achieved by a micro-pool or shallow marsh.

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.

Maintenance Schedule: Extended Dry Detention Basins

Activity	Time of Year	Frequency
Inspect basin	Spring and Fall	Bi-annually
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

Private Commercial or Residential Stormwater BMPs

With regard to privately owned stormwater BMPs associated with commercial facilities and residential subdivisions, the Town's site plan and subdivision regulations require new development projects including commercial facilities to develop and submit an inspection and maintenance plan to outline the maintenance procedures for stormwater treatment BMPs for the current or future property owner or Homeowners Association.

BMP 6-7 Winter Road Maintenance

The Town DPW maintains approximately 200 miles of roadway in accordance with its own Snow and Ice Removal Plan. The Town also maintains several municipal parking lots and sidewalks in critical area and seeks to provide practical safe access to homes, businesses and municipal facilities during winter storms. The Town uses a mixture of 2 parts sand to one-part salt for its typical applications for deicing purposes. This mixture may be supplemented with liquid calcium chloride during cold temperatures below 20 degrees. There are no know chloride impaired waters in the MS4 area.

The DPW is currently acquiring additional equipment to increase its liquid deicer storage capacity and use to increase the effectiveness and efficiency of road salt.

Best Practices

The Town utilizes the following basic practices to optimize its snow and ice control operations and minimize its deicing chemical usage:

- Plowing snow is considered the first line of defense for clearing roads.

- School bus routes and the downtown area are generally given highest priority.
- Applying road salt to roads is done only when necessary and under appropriate temperature conditions.
- Road salt is generally applied along the roadway centerline to allow vehicle traffic and the crown slope mix the salt with snow to create a brine mix.
- DPW spreader trucks are calibrated each year prior to each winter season to make sure that application settings are putting out the targeted amount.
- DPW uses various weather forecast information to help in the decision-making process in determining when plowing and/or deicer applications may be necessary.
- Several DPW employees have attended the Green SnowPro® Certification training program and will look to continue to train employees in the future as funding allows
- Sand is only applied in select areas to assist with traction. Unpaved or gravel roads are only treated with sand.
- Road salt and sand mixed with salt are stored under cover or enclosed buildings.

Procedures

The Town generally uses the following recommended procedures for winter maintenance to reduce discharge of pollutants from the MS4 areas.

Deicing Applications

- Minimize the use and optimize the application of sodium chloride and other salt (while maintaining public safety) and consider opportunities for use of alternative materials.
- Optimize sand and/or chemical application rates through the use, where practicable, of automated application equipment (e.g., zero velocity spreaders), anti-icing and pre-wetting techniques, implementation of pavement management systems, and alternate chemicals.
- Only apply enough deicer so that plows can remove the snow and ice. Adjust the application rate of deicers based on the type of storm, type of agent used, and anti-icing and pre-wetting techniques used.
- Remove as much snow as possible using mechanical means like plowing, blowing, or shoveling before deicing to reduce the need for road salt or other deicing chemicals.
- When possible, use anti-icing practices to prevent ice formation and reduce the need for deicers.
- Only apply road salt when the pavement temperature is above 15° F.
- When using deicers, use pre-wetting agents (e.g., salt brine) to help them work more efficiently and to reduce road salt scatter and bounce.
- Use alternative deicing materials instead of sodium chloride as appropriate (e.g., calcium magnesium acetate, magnesium chloride, or calcium chloride).
- Avoid mixing road salt and sand. Doing so makes both the salt and sand work less efficiently and leads to over-application.

- Perform unloading/loading of trucks on impervious surfaces whenever possible. These areas should be frequently cleaned and swept to reduce the tracking and runoff of salt and to capture any spills.
- Track the amount of deicer used and maintain records of the application of sand, anti-icing and/or de-icing chemicals to document the reduction of chemicals to meet established goals.

Equipment and Maintenance

- Calibrate equipment to reduce and optimize salt use and ensure deicing agents are being used efficiently. Provide employee training on proper calibration procedures.
- Do not overfill trucks with deicing materials as it may lead to spills.
- Encourage the use of automated application equipment like zero velocity spreaders.
- When possible, retrofit vehicles to include equipment such as on-board application regulators, temperature sensors for air and pavement, and anti-icing and pre-wetting equipment.
- Wash equipment using proper procedures to prevent pollutants from entering the stormwater system. Dry cleanup procedures should be used when possible.
- Regularly inspect and maintain equipment to reduce the potential for leaks.

Storage of Deicing Materials

- Prevent exposure of deicing product (salt, sand, or alternative products) storage piles to precipitation by enclosing or covering the storage piles. Implement good housekeeping, diversions, containment or other measures to minimize exposure resulting from adding to or removing materials from the pile. Store piles in such a manner as not to impact surface water resources, groundwater resources, recharge areas, and wells.
- Store materials under covered or enclosed areas and on impervious surfaces.
- Ensure that there are adequate drainage controls in storage areas to prevent runoff from entering the stormwater system.
- Follow appropriate loading and unloading procedures. If there are spills when loading or unloading materials.
- Frequently sweep near the storage/loading areas to reduce the amount of salt, sand, or other materials that is tracked out.
- For liquid deicing chemicals, provide secondary storage containment.
- Do not store road salt near drinking water supplies, surface water resources, groundwater resources, recharge areas, and wells.

Snow Storage and Disposal

- Snow should not be pushed or dumped into waterbodies or wetlands, into stormwater drainage swales or ditches, or on top of catch basins.
- Snow should not be stored near drinking water areas, waterbodies, or wetlands.
- Avoid storing snow in areas that are unstable, areas of potential erosion, or high points where snow may melt and collect debris as runoff before it enters the stormwater system.
- Consider sun exposure when storing snow. Snow in areas with higher sun exposure will melt faster but may require deicers if the snowmelt refreezes.
- The Town currently disposes of snow in compliance with MS4 regulations.

BMP 6-8: Stormwater Pollution Prevention Plans (SWPPPs)

Stormwater Pollution Prevention Plans (SWPPPs) have been developed for the DPW facility and West Road Transfer Station which are the only facilities within the MS4 that have outside storage of materials that may potentially exposed to stormwater. These SWPPPs are retained at the DPW facility and include a description as well as a site map of the material handling and maintenance activities at each facility. The maps also show locations of stormwater outfalls, BMPs, structural controls and receiving waters.

The SWPPPs include instructions for conducting routine facility inspections and associated documentation forms.

BMP 6-9: Phosphorus Source Control Plan

Since Robinson Pond has a phosphorus TMDL, the Town will develop a Lake Phosphorus Control Plan (LPCP) within 5 years of the effective date to identify phosphorus sources and control measures that can be implemented to try to meet the targeted load reduction from municipal areas within the watershed. The Plan will include an implementation schedule for next 15 years and identify the potential costs and funding sources to enable implementation (see Appendix F requirements in Attachment D). There are several interim milestones in the first 5 years including an assessment of regulations, legal authority and potential funding by year 3 to initiate Plan development. The plan should include structural and non-structural measures.

BMP 6-10: Future Stormwater BMP Retrofits on Town Property

Per Appendix F requirements, within 5 years of the effective permit date, the Town will need to evaluate and develop an inventory of potential Town-owned properties that represent feasible locations for stormwater BMP retrofits to treat existing paved areas and reduced existing pollutant loads. The inventory and feasibility assessment will need to be included in the 5th year Annual Report and incorporated into the LPCP.

When the analysis is completed, the following information will be summarized:

Potential BMP Site	Street Address	Est. Treated Area	Receiving Water

ATTACHMENTS

A: Completed CB Cleaning Logs

B: Completed Street Sweeping Logs

C: Completed Stormwater BMP Inspection Forms

D: Phosphorus Control Plan Requirements for Robinson Pond (per Appendix F of MS4 Permit)

ATTACHMENT A:

Completed CB Cleaning Logs

ATTACHMENT B:

Completed Street Sweeping Logs

2019 CB Cleaning Data

Street	Abbreviation	Number	Feature	Sump/Inve	ert Depth	Cleaned	3/2/1/0	Amount (Yard)
A Street	A	1	CB	Sump	36	YES	2	0.93
	A	2	CB	Sump	34	YES	2	0.93
	A	3	CB	Sump	36	YES	1	0.47
	A	4	CB	Sump	44	YES	2	0.93
	A	5	CB	Sump	26	YES	2	0.93
	A	6	CB	Sump	42	YES	2	0.93
	A	7	CB	Sump	28	YES	1	0.47
	A	8	CB	Sump	22	YES	2	0.93
	A	9	CB	Sump	22	YES	1	0.47
Beechwood Road	BEW	1	CB	Sump	39	YES	2	0.93
	BEW	2	CB	Sump	37	YES	2	0.93
	BEW	3	CB	Sump	34	YES	1	0.47
	BEW	4	CB	Sump	44	YES	1	0.47
	BEW	5	CB	Sump	35	YES	2	0.93
	BEW	6	CB	Sump	40	YES	1	0.47
	BEW	7	CB	Sump	35	YES	2	0.93
	BEW	8	CB	Sump	37	YES	2	0.93
	BEW	9	CB	Sump	28	YES	1	0.47
	BEW	10	CB	Sump	38	YES	1	0.47
	BEW	11	CB	Sump	41	YES	1	0.47
	BEW	12	CB	Sump	35	YES	1	0.47
	BEW	13	CB	Sump	40	YES	2	0.93
	BEW	14	CB	Sump	36	YES	2	0.93
	BEW	15	CB	Sump	39	YES	1	0.47
	BEW	16	CB	Sump	37	YES	2	0.93
	BEW	17	CB	Sump	45	YES	1	0.47
	BEW	18	CB	Sump	61	YES	2	0.93
	BEW	19	CB	Sump	34	YES	1	0.47
	BEW	20	CB	Sump	40	YES	2	0.93
	BEW	21	CB	Sump	42	YES	1	0.47
	BEW	22	CB	Sump	38	YES	1	0.47
Burns Hill Road	BUL	1	CB	Sump	48	Yes	1	0.47
	BUL	2	CB	Sump	59	Yes	2	0.93
	BUL	3	CB	Sump	80	Yes	1	0.47
	BUL	4	CB	Sump	133	Yes	1	0.47
2015	BUL	5	CB	Sump	48	Yes	1	0.47
	BUL	6	CB	Sump	36	Yes	1	0.47
	BUL	7	CB	Sump	84	Yes	3	1.40
	BUL	8	CB	Sump	60	Yes	1	0.47
Hazelwood Road	HAZ	1	CB	Sump	34	Yes	1	0.47
	HAZ	2	CB	Sump	33	Yes	1	0.47
	HAZ	3	CB	Sump	33	Yes	2	0.93
	HAZ	4	CB	Sump	66	Yes	1	0.47
	HAZ	5	CB	Sump	54	Yes	2	0.93
	HAZ	6	CB	Sump	57	Yes	1	0.47
2017	HAZ	7	CB	Sump	55	Yes	2	0.93
Rangers Drive	RAN	1	CB	Sump	64	Yes	2	0.93
	RAN	2	CB	Sump	70	Yes	1	0.47
	RAN	3	CB	Sump	77	Yes	2	0.93

	RAN	4	CB	Sump	57	**Yes**	**1**	0.47
	RAN	5	CB	Sump	74	**Yes**	**2**	0.93
	RAN	6	CB	Sump	82	**Yes**	**1**	0.47
	RAN	7	CB	Sump	78	**Yes**	**1**	0.47
	RAN	8	CB	Sump	84	**Yes**	**1**	0.47
	RAN	9	CB	Sump	72	**Yes**	**1**	0.47
	RAN	10	CB	Sump	72	**Yes**	**2**	0.93
	RAN	11	CB	Sump	73	**Yes**	**1**	0.47
	RAN	12	CB	Sump	70	**Yes**	**1**	0.47
	RAN	13	CB	Sump	72	**Yes**	**1**	0.47
	RAN	14	CB	Sump	70	**Yes**	**1**	0.47
	RAN	15	CB	Sump	64	**Yes**	**1**	0.47
	RAN	16	CB	Sump	77	**Yes**	**1**	0.47
	RAN	17	CB	Sump	36	**Yes**	**2**	0.93
	RAN	18	CB	Sump	60	**Yes**	**1**	0.47
	RAN	19	CB	Sump	48	**Yes**	**1**	0.47
	RAN	20	CB	Sump	60	**Yes**	**1**	0.47
	RAN	21	CB	Sump	144	**Yes**	**1**	0.47
2015	RAN	22	CB	Sump	60	**Yes**	**2**	0.93
Regina Avenue	REG	1	CB	Sump	30	**Yes**	**1**	0.47
	REG	2	CB	Sump	40	**Yes**	**1**	0.47
	REG	3	CB	Sump	30	**Yes**	**1**	0.47
	REG	4	CB	Sump	20	**Yes**	**1**	0.47
Ricky Drive	RIC	1	CB	Sump	32	**Yes**	**1**	0.47
	RIC	2	CB	Sump	18	**Yes**	**1**	0.47
	RIC	3	CB	Sump	20	**Yes**	**1**	0.47
Roy Drive	ROY	1	CB	Sump	67	**Yes**	**1**	0.47
	ROY	2	CB	Sump	72	**Yes**	**1**	0.47
	ROY	3	CB	Sump	43	**Yes**	**1**	0.47
	ROY	4	CB	Sump	29	**Yes**	**1**	0.47

# of CB's cleaned 107 volume 49.8

ATTACHMENT C:

Completed Stormwater BMP Inspection Forms

Town of Hudson Operations and Maintenance Plan – Nov. 2020 Update

Listing of Town-Owned Stormwater BMPs by Location and Type

BMP ID No	BMP Type	Street Address	Est. Size (sq. ft)	Date of Last Maintenance
1	Detention Basin	2 Hummingbird Lane	2,500	September 2020
2	Detention Basin	Sousa Blvd (powerlines)	16,000	September 2020
3	Detention Basin	67 Sousa Blvd (by house 67)	5,000	September 2020
4	Detention Basin	9 Breakneck Road	1,500	November 2020
5	Detention Basin	9 Serenity Circle	5,400	September 2020
6	Detention Basin	4 Granite Hill Road	1,800	May 2020
7	Detention Basin	Kara Crossing Drive	1,000	November 2020
8	Detention Basin	11 Kara Crossing Drive	5,500	November 2020
9	Detention Basin	23 Shoreline Drive	21,000	September 2020
10	Detention Basin	4 Sir Isaac	4,000	Feb. 2020
11	Detention Basin	11 Gabrielle Drive	10,000	September 2020
12	Detention Basin	Empire Circle	8,000	
13	Detention Basin	7 Paula Drive	5,000	October 2020
14	Detention Basin	35 Copeland Dr	4,567	
15	Detention Basin	46 Derry Rd (under power lines)	41,100	September 2020
16	Detention Basin	63 Derry Rd (Nellie Court)	2,370	
17	Detention Basin	76 Derry Rd	33,594	
18	Underground Filtration/ Infiltration Basin	12 Hudson Hills Dr	3,184	September 2020
19	Detention Basin	19 Kimball Hill Rd	959	
20	Detention Basin	22 Allyson Dr	12,614	November 2020
21	Detention Basin	2 Rangers Drive	4,700	
22	Detention Basin	13 Rangers Drive	9,375	
23	Detention Basin	49 Rangers Drive	72,000	November 2020
24	Detention Basin	12 Copper Hill Road	4,200	October 2020
25	Detention Basin	10 Sunshine Drive	4,500	October 2020
25	Detention Basin	51 Flying Rock Drive		October 2020
26	Detention Basin	10 Leaor Drive	2,700	October 2020
27	Detention Basin	Sheffield Circle		
28	Detention Basin	50 Moose Hill Road	15,000	November 2020
29	Underground Treatment System (Vortechs System)	34 Webster Street		September 2020

ATTACHMENT D:

Phosphorus Control Plan Requirements for Robinson Pond (per Appendix F of MS4 Permit)

MS4 Permit Appendix F Requirements for Lakes and Ponds with Phosphorus TMDL

The permittee shall develop a Lake Phosphorus Control Plan (LPCP) designed to reduce the amount of phosphorus in stormwater discharges from its MS4 to the impaired waterbody or its tributaries consistent with assumptions and requirements of the WLA for the phosphorous loadings published in the applicable phosphorus TMDL (see Table F-2 for TMDL names and links to applicable phosphorus TMDLs). Table F-2, Appendix F provides the percent reductions in stormwater total phosphorus load for each municipality to be consistent with the assumptions and requirements of the WLA

a. The permittee shall develop a Lake Phosphorous Control Plan (LPCP) as part of its written SWMP and update the LPCP in annual reports pursuant to Part 4.4 of the Permit. The LPCP shall describe measures the permittee will undertake to reduce the amount of phosphorous in MS4 discharges.
b. The LPCP shall be implemented in accordance with the following schedule and contain the following elements:
    i) LPCP Implementation Schedule – The permittee shall complete the implementation of its LPCP as soon as possible but no later than 15 years after the effective date of the permit.
    ii) The LPCP shall be implemented in accordance with the following schedule and contain the following elements:
    iii) Description of LPCP Components:
        a. Legal Analysis- The permittee shall develop and implement an analysis that identifies existing regulatory mechanisms available to the MS4 such as by-laws and ordinances and describe any changes to these regulatory mechanisms that may be necessary to effectively implement the LPCP. This may include the creation or amendment of financial and regulatory authorities. The permittee shall adopt necessary regulatory changes by the end of the permit term.
        b. Scope of the LPCP (LPCP Area) - The permittee shall indicate the area in which the permittee plans to implement the LPCP, this area is known as the "LPCP Area". The permittee must choose one of the following: 1) to implement its LPCP in the entire area within its jurisdiction discharging to the impaired waterbody (for a municipality this would be the municipal boundary) or 2) to implement its LPCP in only the urbanized area portion of its jurisdiction discharging to the impaired waterbody. If the permittee chooses to implement the LPCP in its entire jurisdiction discharging to the impaired waterbody, the permittee may demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural and non-structural controls on discharges that occur both inside and outside the urbanized area. If the permittee chooses to implement the LPCP in its urbanized area only discharging to the impaired waterbody, the permittee must demonstrate compliance with the Phosphorus Reduction Requirement and Allowable Phosphorus Load requirements applicable to it through structural and non-structural controls on discharges that occur within the urbanized area only.
        c. Calculate Baseline Phosphorus Load (P*base*), Phosphorus Reduction Requirement (P*RR*) and Allowable Phosphorus Load (P*allow*) –Permittees shall calculate their numerical Allowable Phosphorus Load and Phosphorus Reduction Requirement in mass/yr by first estimating their Baseline Phosphorus Load in mass/yr from its LPCP Area consistent with the methodology in Attachment 1 to Appendix F or the applicable TMDL, the baseline shall only be estimated using land use phosphorus export coefficients in Attachment 1 to Appendix F or the applicable TMDL methodology and not account for phosphorus reductions resulting from implemented structural BMPs completed to date. Table F-2 contains the percent phosphorus reduction required from urban stormwater consistent with the TMDL of each impaired waterbody. The permittee shall apply the applicable required percent reduction in Table F-2 to the calculated Baseline Phosphorus Load to obtain the permittee specific Phosphorus Reduction Requirement in mass/yr. The Phosphorus Reduction Requirement load shall then be subtracted from the Baseline Phosphorus Load to obtain the permittee specific Allowable Phosphorus Load.

d. Description of planned non-structural controls – The permittee shall describe the non-structural stormwater control measures to be implemented to support the achievement of the milestones in Table F-3. The description of non-structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation. Annual phosphorus reduction from non-structural BMPs shall be calculated consistent with Attachment 2 to Appendix F. The permittee shall update the description of planned non-structural controls as needed to support the achievement of the milestones in Table F-3, including an update in the updated written LPCP 10 years after the permit effective date.

e. Description of planned structural controls – The permittee shall develop a priority ranking of areas and infrastructure within the municipality for potential implementation of phosphorus control practices. The ranking shall be developed through the use of available screening and monitoring results collected during the permit term either by the permittee or another entity and the mapping required pursuant to Part 2.3.4.6 of the Permit. The permittee shall also include in this prioritization a detailed assessment of site suitability for potential phosphorus control measures based on soil types and other factors. The permittee shall coordinate this activity with the requirements of Part 2.3.6.e. of the Permit. A description and the result of this priority ranking shall be included in the LPCP. The permittee shall describe the structural stormwater control measures necessary to support achievement of the milestones in Table F-3. The description of structural controls shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Structural measures to be implemented by a third party may be included in the LPCP. Annual phosphorus reduction from structural BMPs shall be calculated consistent with Attachment 3 to Appendix F. The permittee shall update the description of planned structural controls as needed to support the achievement of the milestones in Table F-3, including an update in the updated written LPCP 10 years after the permit effective date.

f. Description of Operation and Maintenance (O&M) Program for all planned and existing structural BMPs – The permittee shall establish an Operation and Maintenance Program for all structural BMPs being claimed for phosphorus reduction credit as part the LPCP. This includes BMPs implemented to date as well as BMPs to be implemented. 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.

g. Implementation Schedule – An initial schedule for implementing the BMPs, including, as appropriate: funding, training, purchasing, construction, inspections, monitoring, O&M and other assessment and evaluation components of implementation. Implementation of planned BMPs must begin upon completion of the LPCP, and all non-structural BMPs shall be fully implemented within six years of the permit effective date. Where planned structural BMP retrofits or major drainage infrastructure projects are expected to take additional time to construct, the permittee shall within four years of the effective date of the permit have a schedule for completion of construction consistent with the reduction requirements in Table F-3. The permittee shall complete the implementation of its LPCP as soon as possible or at a minimum in accordance with the milestones set forth in Table F-3. The implementation schedule shall be updated as needed to support the achievement of the milestones in Table F-3, including an update in the updated written LPCP 10 years after the permit effective date.

h. Cost and funding source assessment – The permittee shall estimate the cost for implementing its LPCP and describe known and anticipated funding mechanisms. The permittee shall describe the steps it will take to implement its funding plan. This may include but is not limited to conceptual development, outreach to affected parties, and development of legal authorities.

i. Complete written LPCP – The permittee must complete the written LPCP 5 years after permit effective date. The complete LPCP shall include item numbers 1-8 in Table F-3. The permittee

shall make the LPCP available to the public for public comment during the LPCP development. EPA encourages the permittee to post the LPCP online to facilitate public involvement. The LPCP shall be updated as needed with an update 10 years after the permit effective date at a minimum to reflect changes in BMP implementation to support achievement of the phosphorus export milestones in Table F-3. The updated LPCP shall build upon the original LPCP and include additional or new BMPs the permittee will use to support the achievement of the milestones in Table F-3.

j. Performance Evaluation – The permittee shall evaluate the effectiveness of the LPCP by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs3 and tracking increases in phosphorus loading from the LPCP Area beginning six years after the effective date of the permit. Phosphorus reductions shall be calculated consistent with Attachment 2 (non-structural BMP performance), Attachment 3 (structural BMP performance) and Attachment 1 (reductions through land use change), to Appendix F for all BMPs implemented to date4. Phosphorus load increases resulting from development shall be calculated consistent with Attachment 1 to Appendix F. Phosphorus loading increases and reductions in units of mass/yr shall be added or subtracted from the calculated Baseline Phosphorus Load to estimate the yearly phosphorous export rate from the LPCP Area in mass/yr. The permittee shall also include all information required in Part III.1.c. of this Appendix in each performance evaluation.

Step	LPCP Milestones	Description	Examples	Completion Date
1	Legal Analysis	Identify and evaluate existing or potential new regulations that may be needed to effectively reduce existing phosphorus loads. 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.	Site Plan Regs, Septic Systems, Lawn Fertilizer, Beach usage rules	2 years /2020
2	Define LPCP scope (LPCP Area)	Determine the area in which the LPCP will be implemented and dub it “LPCP Area”. Permittee needs to choose between implementing the plan over the entire jurisdiction discharging to impaired waterbodies or just focusing on the urbanized area. Compliance with applicable phosphorus load requirements can be demonstrated through structural and non-structural controls on discharges either over the whole jurisdiction or specifically focused within the urbanized area depending upon which implementation strategy is chosen.		4 years
3	Calculate Baseline Phosphorus, Allowable Phosphorus Load and Reduction Requirement	Calculate the numerical Allowable Phosphorus Load and Phosphorus Reduction Requirement in mass/yr by estimating the Baseline Phosphorous Load from their LPCP area. Baseline should only be estimated using land use phosphorus export coefficients. Do not account for phosphorus reductions resulting from implemented structural BMPs completed to date in the Baseline estimate. Table F-2 in the MS4 document shows the percent phosphorus reduction required from urban		4 years

		stormwater consistent with the TMDL of each impaired waterbody. The applicable required percent reduction determined from that table should be applied to the calculated Baseline Phosphorus Load to obtain the permittee specific Phosphorus Reduction Requirement in mass/yr. (Baseline Phosphorous Load - Phosphorous Reduction Requirement = Allowable Phosphorous Load).		
4A	Description of planned nonstructural controls	Describe non-structural control measures to be implemented. The description shall include the planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions that are expected to result from their implementation. Annual Phosphorous Reduction from non-structural BMPS should be calculated in accordance with Table 2 in the MS4. Updates should be made as needed, and an update in the LPCP should be made after 10 years of the permit effective date.		5 years & updated after 10 years of permit effective date
4B	Description of planned structural controls	Develop a priority ranking of areas and infrastructure within the municipality for potential implementation of phosphorus control practices. The ranking will be developed using screening and monitoring results collected during the permit term. The permitee shall also include a detailed assessment of site suitability for potential phosphorus control measures based on soil types and other factors. A description and the result of this priority ranking should be included in the LPCP. Structural stormwater control measures needed for achievement should be described, including planned measures, the areas where the measures will be implemented, and the annual phosphorus reductions in units of mass/yr that are expected to result from their implementation. Annual phosphorus reduction from structural BMPs shall be calculated consistent with Attachment 3 of the MS4, and updates to the planned structural controls section should be completed as needed.		5 years & updated after 10 years of permit effective date
5	Description of Operation and Maintenance (O&M) Program	Permittee shall establish an O&M plan for all structural BMPs being claimed for phosphorus reduction credit as part the LPCP. This includes all current/future BMPS. The O&M Plan should include an inspection and maintenance schedule for each BMP and the department responsible for maintenance.		5 years
6	Implementation schedule	Schedule for implementing BMP's should include funding, training, purchasing, construction, inspections, monitoring, O&M and other assessment and evaluation components of implementation. The implementation schedule		5 years

		shall be updated as needed to support the achievement of milestones.		
7	Cost and Funding Source Assessment	Determine the cost for implementing the LPCP and describe known and anticipated funding mechanisms. Describe steps to be taken to implement the funding plan, including conceptual development, outreach to affected parties, and development of legal authorities.		5 years
8	Complete written LPCP	The written LPCP should be completed within 5 years and should include items number 1-8. LPCP shall be available for public comment during its development. The LPCP shall be updated as needed with an update 10 years after the permit effective date at a minimum to reflect changes in BMP implementation to support achievement of the phosphorus export milestones.		5 years
9	Full implementation of nonstructural controls.	Implementation of planned BMPs must begin upon completion of LPCP and all non-structural BMPs need to be implemented within 6 years. Where planned structural BMP retrofits or major drainage infrastructure projects are expected to take additional time to construct, the permittee will need to have a schedule of completion created within 4 years.		6 years
10	Performance Evaluation.	Effectiveness will be evaluated by tracking the phosphorus reductions achieved through implementation of structural and non-structural BMPs and tracking increases in phosphorus loading from the LPCP Area beginning six years after the effective date of the permit. Phosphorus loading increases and reductions in units of mass/yr shall be added or subtracted from the calculated Baseline Phosphorus Load to estimate the yearly phosphorous export rate from the LPCP Area in mass/yr. This performance evaluation and calculations should be performed annually from 6 years to 15 years after the permit effective date.		6 through 15 years

Employee Training Sheet

Town of Hudson 2020 IDDE Training

Training Date: 12-10-2020	
Training Description: IDDE Training	
Trainer: Bill Aricier, VHB	
Employee(s) trained	**Employee signature**
Jim Lavacchia	
Jess Forrester	
Joshua Edwards	
Jason Twardoski	
Jeremy Faulkner	