

# Stormwater Management Program

---

*Lowell Regional Wastewater Utility*



*Submission Date: December 31, 2023*



## STORMWATER MANAGEMENT PROGRAM (SWMP)

### CERTIFICATION STATEMENT

I certify under penalty of perjury that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I 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.

\_\_\_\_\_  
Aaron Fox  
Executive Director  
Lowell Regional Wastewater Utility

12/31/2023

\_\_\_\_\_  
Date

**Document Revision Table**

<b>Date</b>	<b>SWMP Section</b>	<b>Change</b>	<b>Reason</b>	<b>Author / Approval</b>
7/30/03	NOI	City submitted initial NOI	MS4 requirement.	
12/31/23	Overall document	General structure and formatting changes	To provide a more coherent SWMP document.	Author: G. Bergeron Approval: A. Fox
12/31/23	Section 7	Changes to Best Management Practices lists	To improve SWMP and reflect progress made since prior submittal.	Author: G. Bergeron Approval: A. Fox
12/31/23	Section 8	More detail given with respect to phosphorus control program.	As required per Consent Decree	Author: G. Bergeron Approval: A. Fox

# TABLE OF CONTENTS

<b><u>SECTION</u></b>	<b><u>PAGE</u></b>
<b>CERTIFICATION</b> .....	<b>i</b>
<b>1. BACKGROUND</b> .....	<b>1</b>
1.1 PERMIT PROGRAM BACKGROUND .....	1
1.2 STORMWATER MANAGEMENT PROGRAM (SWMP).....	1
1.3 LOWELL MS4 BACKGROUND .....	2
1.4 LEGAL AUTHORITY.....	3
1.5 ADDITIONAL MS4 DISCHARGES IN LOWELL .....	3
1.6 ELIGIBILITY.....	3
1.6.1 ENDANGERED SPECIES .....	4
1.6.2 HISTORIC PROPERTIES.....	4
<b>2. STORMWATER MANAGEMENT PROGRAM TEAM</b> .....	<b>5</b>
2.1 SWMP TEAM ROLES AND RESPONSIBILITIES.....	5
2.1.1 SWMP COORDINATOR .....	5
2.1.2 SWMP TEAM ROLES AND RESPONSIBILITIES .....	5
2.2 INTERDEPARTMENTAL COLLABORATION .....	6
<b>3. MS4 RECEIVING WATERS</b> .....	<b>7</b>
3.1 IMPAIRMENTS AND WATER QUALITY LIMITED WATERS.....	7
<b>4. MINIMUM CONTROL MEASURES</b> .....	<b>9</b>
4.1 MCM 1: PUBLIC EDUCATION AND OUTREACH .....	9
4.1.1 OBJECTIVE .....	9
4.1.2 PERMIT SUMMARY .....	9
4.1.3 BEST MANAGEMENT PRACTICES (BMPs) .....	10
4.2 MCM 2: PUBLIC INVOLVEMENT AND PARTICIPATION .....	13
4.2.1 OBJECTIVE .....	13
4.2.2 PERMIT SUMMARY .....	13
4.2.3 BEST MANAGEMENT PRACTICES.....	13
4.3 MCM 3: ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM .....	16
4.3.1 OBJECTIVE .....	16
4.3.2 PERMIT SUMMARY .....	16
4.3.3 BEST MANAGEMENT PRACTICES.....	16
4.4 MCM 4: CONSTRUCTION SITE STORMWATER RUNOFF CONTROL.....	19
4.4.1 OBJECTIVE .....	19
4.4.2 PERMIT SUMMARY .....	19

4.4.3 BEST MANAGEMENT PRACTICES.....	20
4.5 MCM 5: POST CONSTRUCTION STORMWATER MANAGEMENT .....	22
4.5.1 OBJECTIVE .....	22
4.5.2 PERMIT SUMMARY .....	22
4.5.3 BEST MANAGEMENT PRACTICES.....	22
4.6 MCM 6: POLLUTION PREVENTION / GOOD HOUSEKEEPING .....	25
4.6.1 OBJECTIVE .....	25
4.6.2 PERMIT SUMMARY .....	25
4.6.3 BEST MANAGEMENT PRACTICES.....	26
<b>5 MERRIMACK RIVER PHOSPHORUS IMPAIRMENT .....</b>	<b>28</b>
5.1 Enhanced Phosphorus Control BMPs.....	28
5.2 Phosphorus Source Identification Report.....	28
5.3 Phosphorus Source BMP Project .....	29
<b>APPENDIX A: EPA MAP .....</b>	<b>30</b>
<b>APPENDIX B: GOOD HOUSEKEEPING MANUAL.....</b>	<b>31</b>

<b><u>TABLES</u></b>	<b><u>PAGE</u></b>
Table 1: SWMP Team Members.....	5
Table 2: Interdepartmental Coordination Areas.....	6
Table 3: Receiving MS4 Waterbodies in Lowell .....	7
Table 4: Impaired Waterbodies in Lowell .....	8
Table 5: Targeted Pollutants of Concern.....	10
Table 6: MCM 1, Public Education and Outreach Program.....	12
Table 7: MCM 2, Public Involvement and Participation Program .....	15
Table 8: MCM 3, Illicit Discharge Detection and Elimination (IDDE) .....	18
Table 9: MCM 4, Construction Site Stormwater Runoff Control Program.....	21
Table 10: MCM 5, Post Construction Stormwater Management.....	24
Table 11: MCM 6, Pollution Prevention / Good Housekeeping Program .....	27

## **LIST OF ACRONYMS**

BMP – Best Management Practice  
CD – Consent Decree  
CWA – Clean Water Act  
DPD – Department of Planning & Development  
DPW – Department of Public Works  
ESA – Endangered Species Act  
IDDE – Illicit Discharge Detection and Elimination  
LID – Low Impact Design  
MCM – Minimum Control Measure  
MS4 – Municipal Separate Storm Sewer System  
NOI – Notice of Intent  
SSO – Sanitary Sewer Overflow  
SWMP – Stormwater Management Program  
USEPA – United States Environmental Protection Agency

# 1. BACKGROUND

## 1.1 PERMIT PROGRAM BACKGROUND

On May 1, 2003, U.S. Environmental Protection Agency (USEPA) Region 1 issued its Final General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (2003 Small MS4 Permit) consistent with the Phase II Rule (1999, [Phase II Rule Fact Sheet](#)). The 2003 Small MS4 permit covers "traditional" (i.e., cities and towns) and "non-traditional" (i.e., Federal and state agencies) MS4 Operators located in the Commonwealth of Massachusetts and the State of New Hampshire. These two New England states do not have regulatory primacy and the EPA issues the regulations and permits.

The City of Lowell (City) submitted the Notice of Intent (NOI) on July 30, 2003 and it is posted on the EPA website ([Lowell NOI](#)). Authorization to discharge under the 2003 Permit was granted by the EPA on October 3, 2004. Lowell maintains authorization to discharge under the 2003 Permit. In compliance with the 2003 Permit, the City submitted a full outfall inventory, annual reporting updates, and a draft SWMP.

This permit expired on May 1, 2008 but remained in effect until operators were authorized under the 2016 MS4 general permit, which became effective on July 1, 2018. Communities were able to challenge the 2016 MS4 general permit and negotiate a modified individual MS4 permit with the regulators. The City submitted this request for an individual MS4 permit.

Until recently, the City was operating solely under the 2003 Small MS4 General Permit. In June 2022, federal and state agencies initiated Consent Decree (CD) negotiations with the City. Throughout the process, the City negotiated with the agencies' legal and technical teams to reach an agreement in December 2023. The final CD will be submitted to Federal Court in 2024. In accordance with the CD, the City shall remain under the 2003 MS4 permit with additional requirements stipulated per the CD.

These requirements include:

- The development of an Illicit Discharge Detection Elimination (IDDE) program,
- Additional stormwater mapping requirements,
- Utilization of Best Management Practices in stormwater management design,
- Updates to ordinances to address pre- and post-construction stormwater controls, and
- Updates to this Stormwater Management Program (initially issued in 2003) to update the Minimum Control Measures (MCM) and Best Management Practices (BMPs) to minimize the impact of phosphorus, including a Phosphorus Source Identification Report and development of an BMP demonstration project on a municipal property.

## 1.2 STORMWATER MANAGEMENT PROGRAM (SWMP)

The SWMP describes the activities and measures that are being implemented and are proposed to be implemented to meet the MS4 Permit and 2023 CD requirements.

The main elements of the stormwater management program are the six minimum control measures (MCMs):

- **MCM 1 – Public Education and Outreach:** A public education program to affect public behavior contributing to stormwater pollution.
- **MCM 2 – Public Involvement and Participation:** Opportunities for the public to participate and provide comments on the stormwater program.
- **MCM 3 – Illicit Discharge Detection and Elimination (IDDE):** A program to effectively find and eliminate illicit discharges within the MS4.
- **MCM 4 – Construction Site Stormwater Runoff Control:** A program to effectively control construction site stormwater discharges to the MS4.
- **MCM 5 – Post Construction Stormwater Management:** A program to ensure that stormwater from development projects entering the MS4 is adequately controlled by the construction of stormwater controls.
- **MCM 6 – Pollution Prevention / Good Housekeeping:** A good housekeeping program to ensure that stormwater pollution on municipal properties and from municipal operations are minimized.

### **1.3 LOWELL MS4 BACKGROUND**

Located in the northeast United States, the City of Lowell, Massachusetts is an older mill-city, originally incorporated in the 1800s. Like many mill-cities of the time, Lowell grew around the local watershed. Lowell is centrally located at the confluence of the of the Merrimack and Concord rivers, which form the main branches of the local watershed. Tributary receiving waters, including Beaver Brook, Black Brook, and River Meadow Brook, flow through the city limits and into these two main rivers. Additionally, the City has an extensive canal system (dating back to the mills for hydropower) that conveys river flow through its downtown area.

The City was designed to be served by a combined sewer system and has combined sewer overflow (CSO) discharges at nine permitted outfalls. Since the passage of the Clean Water Act (CWA), however, the City has undertaken a large effort to remove stormwater from the sewer through sewer separation and other CSO discharge mitigation measures. As of 2023, approximately 40% of the City's is served by a separated sewer system, which covered under the MS4 General Permit.

Lowell's separate drainage system is defined as a small MS4, as defined in 40 CFR §122.26(b)(16). The City is located within an urbanized area as determined by the 2020 census data provided by the Bureau of Census and, thus, under the permit conditions. The City meets the eligibility criteria of the 2003 Small MS4 Permit for area of coverage, MS4 size classification, urbanized area (Appendix A), impacts to endangered species, and impacts to historic properties. This is discussed further in **Section 1.6**.

The Lowell Regional Wastewater Utility (the Utility) owns and operates the stormwater drainage system alongside the City's combined and sanitary sewer system.

## **1.4 LEGAL AUTHORITY**

In July 2018, the City established a Stormwater Ordinance in the “Code of the City of Lowell, Massachusetts” as Chapter 272 Part 6, entitled, “Management of Stormwater”. Specifically, § 272-110.B. of the ordinance establishes legal authority to “maintain, manage, operate, and regulate the City’s stormwater system”.

Currently, the Utility is amending the City’s Stormwater Ordinance to better manage the impacts brought on by urban stormwater. § 272-109 of the City’s amended Stormwater Ordinance defines the term “Enforcement Authority” as “the Executive Director of Lowell Regional Wastewater Utility, or his or her duly authorized representative agents, assistants, or designees, or other authorized City entities such as plumbing inspectors or the City Engineer”. In accordance with this definition, the Utility is the primary City department in charge of implementing the SWMP as described by this document.

## **1.5 ADDITIONAL MS4 DISCHARGES IN LOWELL**

Per the Consent Decree, as part of the IDDE program, the City will inspect and sample its MS4 outfalls, and MS4 discharges to other municipalities’ MS4s or non-City owned outfalls.

There are other MS4 permittees with drainage systems and outfalls located in Lowell. These permittees include the Massachusetts Department of Transportation (MassDOT), the Massachusetts Department of Conservation & Recreation (DCR), and the University of Massachusetts, Lowell (UMass Lowell). The City is not responsible for sampling discharges from other MS4 permittee outfalls or performing IDDE, unless the City’s discharges impact these separate MS4 systems.

If the City’s municipal drainage system connects to and discharges from another MS4 permittee’s outfall, the City shall inspect and sample the municipal drainage system at the point of connection with the private system. If evidence of an illicit discharge is observed or detected at another MS4 permittee’s outfall and it is not municipally sourced, the City shall inform the responsible MS4 permittee who will address the compliance requirement.

Additionally, private drainage systems and outfalls that are owned and operated by non-MS4 permittees can be found in Lowell. These systems and outfalls typically serve commercial properties and apartment complexes bordering wetlands and waterways. The City is not responsible for sampling discharges from these private non-MS4 permittee outfalls. If the City’s municipal drainage system connects to and discharges from a non-MS4 permittee’s outfall, the City shall inspect and sample the municipal drainage system at the point of connection with the private system.

## **1.6 ELIGIBILITY**

Eligibility under the 2003 MS4 permit was originally established in the NOI and is summarized below.

### **1.6.1 ENDANGERED SPECIES**

During the Notice of Intent (NOI) submission process, the City completed an Endangered Species Act (ESA) review and determined that the City of Lowell's MS4 contains the Northern Long-eared Bat. Using the Endangered Species Act (ESA) eligibility criteria as referenced in the 2003 Permit, Addendum A, the Endangered Species Guidance, the City certified eligibility according to the U.S. Fish and Wildlife Service Criterion B. Under Criterion B, the City affirmed that there are no discharge-related activities involving the habitat of this species of bat and therefore the City's MS4 system does not affect any federally threatened or endangered listed species.

### **1.6.2 HISTORIC PROPERTIES**

As part of the NOI submission process, the City completed an evaluation in accordance with Addendum B, the Historic Properties Guidance, to assess if their MS4 stormwater discharge and allowable non-stormwater discharges has the potential to affect a property that is listed or eligible for listing on the National Register of Historic Places. As recommended by the Guidance, the City referred to the National Park Service's 'National Register of Historic Places' list and identified forty-three properties within the City. The City determined that the historic properties are not directly impacted by the City's stormwater discharges and they are not aware of planned projects which would impact historic properties.

## 2. STORMWATER MANAGEMENT PROGRAM TEAM

Within the Utility, three staff engineers comprise the Stormwater Management Program Team (SWMP Team), who by authorization of the Executive Director of the Lowell Regional Wastewater Utility, form the core team responsible for implementing the SWMP. Of the three staff engineers, one is designated as the SWMP Coordinator and the other two staff provide essential field support. The Utility will be supported in this effort through interdepartmental coordination with authorized representatives from other departments within the City, including the City Clerk, Neighborhood Services, Department of Planning and Development, Public Schools, Department of Public Works, Parks Department, Solid Waste & Recycling Office, City Engineering Department and the local Conservation Commission.

### 2.1 SWMP TEAM ROLES AND RESPONSIBILITIES

The SWMP Team is responsible to maintain compliance with the State and Federal requirements outlined within this SWMP. **Table 1** outlines the team members and their roles to implement the SWMP Program.

**Table 1: SWMP Team Members**

Department	Title	Role
Lowell Regional Wastewater Utility	Staff Engineer	Coordinator
Lowell Regional Wastewater Utility	Staff Engineer	Field Support
Lowell Regional Wastewater Utility	Staff Engineer	Field Support

#### 2.1.1 SWMP COORDINATOR

The SWMP Coordinator is responsible for the implementation and administration of the Utility’s MS4 program, as described by this SWMP. The SWMP Coordinator oversees the SWMP Team, and the completion of programs and best management practices established under the six MCMs, as outlined in **Section 7** of this SWMP. These responsibilities include the oversight and execution of the City’s IDDE program, public education/outreach and involvement programs, site construction phase and post development control programs, and municipal good housekeeping and pollution prevention program. The SWMP Coordinator is responsible for managing any relevant interdepartmental coordination and collaboration needed to achieve SWMP compliance. Furthermore, the SWMP Coordinator is responsible for adhering to all reporting requirements and deadlines necessary to maintain SWMP compliance.

#### 2.1.2 SWMP TEAM ROLES AND RESPONSIBILITIES

SWMP Field Support personnel are responsible for supporting the SWMP Coordinator in the effort to meet the obligations in this SWMP. These responsibilities may include, but are not limited to, the following: drainage system mapping and investigation; outfall screening and sampling; GIS management; data analysis; interdepartmental coordination; and adherence to the BMPs established within the six minimum control measures.

## 2.2 INTERDEPARTMENTAL COLLABORATION

Interdepartmental collaboration is essential to effectively implement the BMPs established under the six MCMs. The SWMP Team coordinates with other municipal departments, listed in **Table 2**, in the MCM areas specified to more effectively achieve the BMPs outlined in this SWMP to achieve compliance with the permit.

**Table 2: Interdepartmental Coordination Areas**

Department	MCM Partnership Areas
City Clerk	1
Neighborhood Services	1, 2
Department of Planning & Development (DPD)	1, 2, 4
Public Schools	1, 2, 6
Department of Public Works (DPW)	1, 2, 6
Parks Department	1, 6
Solid Waste & Recycling Office	2, 6
City Engineering Department	3, 4, 5
Conservation Commission	4

### 3. MS4 RECEIVING WATERS

In 2004, the Utility completed an outfall inspection program that involved walking the banks of each water body in the City to identify the visible outfalls and to obtain dry-weather flow samples of each. A map of the outfalls was created at that time; since then, the City has continued to update the map of City owned MS4 outfalls as additional information is discovered.

An overview of Lowell’s MS4 receiving waterbodies, and the number of known municipal outfalls located in each, are included in **Table 3**, below.

**Table 3: Receiving MS4 Waterbodies in Lowell**

Waterbody Name	# of Known Municipal Outfalls
Beaver Brook	4
Black Brook	14
Concord River	15
Lowell Canals	7
Merrimack River	95
River Meadow Brook	15
Clay Pit Brook	15
Flaggy Meadow Brook	4
Marginal Brook	5
Other (i.e., swamp, drainage swales, wetlands etc.)	102

#### 3.1 IMPAIRMENTS AND WATER QUALITY LIMITED 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. Per the Final Massachusetts Integrated List of Waters for the Clean Water Act 2022 Reporting Cycle, there are six Category 5 Waters with listed impairments in Lowell: the Merrimack River, the Concord River, River Meadow Brook, Beaver Brook, Black Brook, and the Lowell Canals, which are summarized in **Table 4**.

**Table 4: Impaired Waterbodies in Lowell**

Water Body Name	Segment ID	Impairment(s)
Beaver Brook	MA84A-11	<i>Escherichia coli</i> , Debris, Physical substrate habitat alterations, Benthic Macroinvertebrates, Odor, Trash, Turbidity
Black Brook	MA84A-17	<i>Escherichia coli</i> , Debris, Physical substrate habitat alterations, Benthic Macroinvertebrates, Fish Bioassessments, Sedimentation/Siltation, Trash, Turbidity
Concord River	MA82A-08 MA82A-09	<i>Escherichia coli</i> , Eurasian Water Milfoil, <i>Myriophyllum Spicatum</i> , Fanwort, Fish Passage Barrier, Non-Native Aquatic Plants, Water Chestnut, Mercury in Fish Tissue, Debris, Algae, Fecal Coliform, Trash, Turbidity
Lowell Canals	MA84A-29	DDT in Fish Tissue, Lead, Mercury in Fish Tissue, PCBs in Fish Tissue
Merrimack River	MA84A-01 MA84A-02 MA84A-03	Fish Passage Barrier, Fecal Coliform, Mercury in Fish Tissue, Total Phosphorus, PCBs in Fish Tissue
River Meadow Brook	MA82A-10	Fecal Coliform, Temperature, Trash, Debris, Water Chestnut

## 4. MINIMUM CONTROL MEASURES

The City developed this SWMP for compliance with the 2003 MS4 Permit. The City's past Annual Reports from 2004 through 2022 were used to document existing conditions and identify additional stormwater management needs to meet permit requirements. This provides the framework for establishing BMPs for the City under the six MCMs.

The aim of this SWMP is to reduce pollutant loads from stormwater systems to the maximum extent practicable, protect water quality, and meet the requirements under the CWA. The City will identify and implement BMPs to reduce sources of pollutants discharging to waterbodies or their tributaries. A summary of the MCM objectives and requirements are detailed in the following sections along with specific actions and measurable goals. Some BMPs have specific deadlines that must be met, and those that have been started are designated as in progress, while others are on-going efforts that will be completed or updated on an annual basis.

### 4.1 MCM 1: PUBLIC EDUCATION AND OUTREACH

An informed and knowledgeable community is crucial to the success of an MS4 SWMP since it helps to facilitate the following:

- Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important. Public support is particularly beneficial when operators of small MS4s attempt to institute work on new funding initiatives for the program or seek volunteers to help implement the program.
- Greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters.

#### 4.1.1 OBJECTIVE

The City is required to implement a public education program to distribute educational material to the community. The public education program must provide information concerning the impact of stormwater discharges on water bodies. It must address steps and/or activities that the public can take to reduce the pollutants in stormwater runoff. The objective of the public education program is to increase knowledge and change behavior of the public so that the pollutants in stormwater are reduced by stakeholder actions.

#### 4.1.2 PERMIT SUMMARY

The 2003 Permit requires a public education and outreach program and modifications or enhancements that the City has made to address impaired waterbodies and updated regulations. Per Part II B.1. of the 2003 Permit, education and outreach efforts must include material directed at industrial and residential activities that would cause illegal dumping into storm drains and/or impact stormwater discharges on waterbodies. Education and outreach efforts must also be coordinated with local groups such as watershed associations or schools where necessary.

In addition to the 2003 Permit requirements, the program is enhanced if the public is educated on the proper management and disposal of pollutants of concern relevant to the impaired waters of Lowell, which are listed in the [Final Massachusetts Integrated List of Waters for the Clean Water Act 2022 Reporting Cycle](#). **Table 5** describes these pollutants, their potential impacts to Lowell’s waterbodies, and the behaviors that can reduce those impacts. Messaging targeting desired behaviors for Total Phosphorus are required components of the Phosphorus Control Plan and are further detailed in **Section 6.1.1**.

**Table 5: Targeted Pollutants of Concern**

<b>Pollutants of Concern</b>	<b>Impact to Waterbodies</b>	<b>Targeted Sources</b>	<b>Desired Behaviors</b>
<b>Bacteria/ Pathogens</b>	Can cause harm to human and environmental health and well-being.	<ul style="list-style-type: none"> <li>• Pet waste</li> <li>• Septic systems</li> </ul>	<ul style="list-style-type: none"> <li>• Pickup and dispose of pet waste into a trashcan.</li> <li>• Maintain &amp; inspect septic systems.</li> <li>• Dispose of septic waste at the correct facilities.</li> </ul>
<b>Total Phosphorus</b>	Can cause harmful algae blooms and create low oxygen conditions that harm aquatic life.	<ul style="list-style-type: none"> <li>• Pet waste</li> <li>• Grass clippings</li> <li>• Lawn fertilizer</li> <li>• Leaf litter</li> </ul>	<ul style="list-style-type: none"> <li>• Use fertilizer sparingly and never before storms.</li> <li>• Use Phosphorus free, slow-release fertilizers.</li> </ul>
<b>Solids, Oils &amp; Grease (Hydrocarbons), or Metals</b>	Can reduce the penetration of light in the water and limit the growth of aquatic plants.	<ul style="list-style-type: none"> <li>• Leaf litter</li> <li>• Soil and sediment erosion</li> </ul>	<ul style="list-style-type: none"> <li>• Bag or compost leaves and grass clippings.</li> <li>• Establish adequate soil erosion and sediment controls for construction sites.</li> </ul>

### 4.1.3 BEST MANAGEMENT PRACTICES (BMPs)

There are multiple education and outreach strategies through which Lowell seeks to raise the public’s awareness to environmental and stormwater-specific issues. The City plans to use various strategies and outreach media, including:

- Department websites, social media, and special programming;
- Cooperative efforts with local organizations and environmental advocates;
- Informational materials;
- Stewardship and volunteerism;
- Workshops, trainings, presentations, and other events;

**Table 6** details Lowell’s Public Education and Outreach Program and implementation plan. Each BMP includes a lead responsible department, and some BMPs also include supporting departments or parties.

## *Lowell Stormwater Management Program (SWMP)*

The success of each BMP will be measured and evaluated against the metrics provided in the “Measurable Goal” category below. Data collected for each BMP is recorded by the Utility and reported as part of defined reporting requirements.

Table 6: MCM 1, Public Education and Outreach Program

BMP #	BMP Media/Category	BMP Description	BMP Purpose	Targeted Audience	Responsible Department/Parties	Measurable/Deliverable Goal
1-1	Community Events	Participate in various community events held throughout the year. Utilize various messaging tools (i.e. visual displays, posters, or kiosks) to convey general stormwater overview and information regarding how residents can help mitigate the impacts of stormwater runoff.	To educate the public on Lowell’s MS4 system and the impacts of stormwater runoff.	Residents; Business	Utility	List of events attended (including dates) during the reporting term.
1-2	School Program/Curricula	Distribute educational materials on the MS4 and impacts of stormwater runoff to local schools. Teach children what residents can help prevent stormwater pollution.	To educate students, on Lowell’s MS4 system and the impacts of stormwater runoff.	Residents	Utility, Lowell Public Schools	List of schools/classes materials were distributed to during the reporting term.
1-3	Online Messaging	Post flyer/pdf/fact sheet(s) on the City’s website. Include educational messages on best practices for: preventing illegal discharges, automotive maintenance & washing, fertilizer management, swimming pool water disposal, grass clipping disposal, & pet waste disposal.  Post on social media about the following message topics at the appropriate times and link to the posted material: Grass clipping disposal (Spring), Fertilizer management (Spring), Pet Waste Disposal (Summer)	To educate the public on the effects and impacts of non-allowable stormwater discharges. More information as to how this BMP is part of the Utility’s plan to minimize phosphorus in stormwater can be found in <b>Section 6.1.1.</b>	Residents; Business, Institutions, and Commercial	Utility	# of posts made to the City website and social media pages during the reporting term
1-4	Erosion Control/LID/GI messaging	Attach educational flyer on Erosion Controls, Low Impact Design (LID), and Green Infrastructure technologies to Stormwater Permit applications.	To promote proper stormwater control practices to properties undergoing redevelopment	Residential, commercial, and industrial properties undergoing redevelopment	Utility, DPD	# of Stormwater Permit applications filed during the reporting term
1-5	Pet Waste Management	Insert Flyer/Brochure into Dog Licenses at the time of dog license issuance/renewal. Educate and encourage pet owners to pick up after their pets.  Work with Parks Department to post signs in public parks reminding pet owners to pick up after their pets.	Phosphorus and Bacteria Impairments	Residential Pet Owners	Utility, City Clerk, DPW	# of Dog Licenses issued/renewed during reporting term.  # of signs (re)placed.

## 4.2 MCM 2: PUBLIC INVOLVEMENT AND PARTICIPATION

The public can provide valuable input and assistance to a regulated small MS4's SWMP. Federal regulations encourage MS4s to give the public opportunities to play an active role in both the development and implementation of the program. An active and involved community is crucial to the success of a stormwater management program because it allows for:

- **Broader public support** since citizens who participate in the development and decision-making process are partially responsible for the program and, therefore, are more likely to be supportive of and even take an active role in its implementation.
- **Shorter implementation schedules** due to fewer obstacles in the form of public and legal challenges and increased sources in the form of citizen volunteers.
- **A broader base of expertise and economic benefits** since the members of the community will be able to provide a low-cost intellectual resource with personal knowledge of the water resources being protected by the stormwater management program.
- **A conduit to other programs** as citizens involved in the stormwater management program development process provide important cross-connections and relationships with other community and government programs. This benefit is particularly valuable when trying to implement a stormwater program on a watershed basis, as encouraged by USEPA.

### 4.2.1 OBJECTIVE

The City of Lowell will provide opportunity for the public to participate in the implementation and review of the stormwater management program.

### 4.2.2 PERMIT SUMMARY

Phase II stormwater regulations requires a public involvement and participation program and modifications or enhancements that the City made to address impaired waterbodies and updated regulations. Part II B.2. of the 2003 permit requires the City to provide opportunities for the public to participate in the implementation and review of the SWMP. Participation opportunities must follow Massachusetts General Law (MGL) Chapter 30A which provided requirements for public accessibility to governmental body meetings.

### 4.2.3 BEST MANAGEMENT PRACTICES

The City shall comply with State public notice requirements (MGL Chapter 30A, Sections 18-25) when conducting all public involvement activities. The SWMP, all documents submitted to the USEPA for TMDL/Impairment Requirements, and all annual reports will be made available online for the public to view. Additionally, the City shall provide the public with opportunities to participate in the review and implementation of the SWMP. All public participation opportunities will be reported in the annual report.

**Table 7** details the City's Public Participation Program and implementation plan. Each BMP includes a lead responsible department, and certain BMPs also include supporting departments or parties.

## *Lowell Stormwater Management Program (SWMP)*

The success of each BMP will be measured and evaluated against the metrics provided in the “Measurable Goal” category below. Data collected for each BMP is recorded by the Utility and reported as part of defined reporting requirements.

**Table 7: MCM 2, Public Involvement and Participation Program**

<b>BMP #</b>	<b>BMP Media/Category</b>	<b>BMP Description</b>	<b>BMP Purpose</b>	<b>Targeted Audience</b>	<b>Responsible Department/Parties</b>	<b>Measurable/Deliverable Goal</b>
2-1	State Public Notification Compliance	The SWMP, all documents submitted to the USEPA for TMDL/Impairment Requirements, and all annual reports will be made available online for the public to view.	To increase public awareness of the City's SWMP.	Residents; Business, Institutions, and Commercial	Utility	List of documents subject to MGL Chapter 30A, Sections 18-25, posted online to the City website.
2-2	Hold Tours of the Duck Island Wastewater Treatment Utility	Hold tours of the Duck Island Wastewater Treatment Utility for the public. Showcase the various forms of green infrastructure BMPs present at the Utility.	To educate the public on Lowell's MS4 system, GI/LID, and the impacts of stormwater runoff.	Residents	Utility	List of tours conducted (including dates) during the reporting term.
2-3	Sponsor Local Cleanup Events	Sponsor local cleanup events throughout Lowell that see to the cleaning of local wetlands, streets, waterbodies and other areas with the potential to impact the local MS4.	To increase public awareness and involvement of the City's SWMP. To provide the public an opportunity to actively participate in the execution of the SWMP.	Residents	Utility, DPW	List of cleanup events (including dates and # of participants) during the reporting term.
2-4	Hold Monthly/Semi-Annual Household Hazardous Waste Collection Days	Hold monthly hazardous waste collection days for public to safely dispose of hazardous wastes. Hold semi-annual hazardous waste collection days for public to safely dispose of a larger assortment of hazardous wastes.	To prevent the spread of hazardous materials from entering the local MS4. To provide the public an opportunity to actively participate in the execution of the SWMP.	Residents	Utility, DPW	List of events held (including dates) during the reporting term.
2-5	Continue Involvement with Local Advocacy Groups	Foster and maintain involvement with local advocacy groups throughout the Merrimack River Valley.	To increase public awareness and involvement of the City's SWMP.	Institutions	Utility	List of advocacy groups partnered and events participated in (including dates) during the reporting term.

## 4.3 MCM 3: ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM

Discharges from MS4s often include wastes and wastewater from non-stormwater sources. An illicit discharge is any discharge to a MS4 system that is not composed entirely of stormwater.

Illicit discharges enter the system through either direct connection (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the MS4 from cracked sanitary systems, spills collected by drain outlets, and paint or used oil dumped directly into a drain). The result is the release of untreated wastewater and pollutants into the storm sewer system that can contribute to higher levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waterbodies, which could degrade receiving water quality and threaten aquatic species, wildlife, and human health.

### 4.3.1 OBJECTIVE

The City of Lowell will develop, implement, and enforce an IDDE program to systematically detect and eliminate illicit sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges.

### 4.3.2 PERMIT SUMMARY

The 2003 Permit requires the City develop and implement an IDDE program including modifications or enhancements that the City has made to address impaired waterbodies and updated regulations. Part II B.3. of the 2003 permit requires the City to maintain an adequate legal authority to prohibit, investigate, and eliminate illicit discharges and implement appropriate enforcement mechanisms. The City has drafted an Illicit Discharge and Elimination Plan and will update and implement the IDDE ordinance to enforce the IDDE Program.

Major components of the IDDE Program include drainage system mapping, outfall inventory and ranking, sanitary sewer overflow (SSO) inventory, outfall screening and sampling, catchment investigations, identification, and removal of illicit discharges to the MS4 system, and employee training. A copy of the City's IDDE Program is accessible to the public on the City's website.

### 4.3.3 BEST MANAGEMENT PRACTICES

The City will establish an adequate legal authority and enforcement strategy for illicit discharges, maintain an up-to-date SSO inventory, create and update a robust system wide map of Lowell's MS4, implement the written IDDE Program, and train field staff. These efforts will lead to an enhanced understanding of catchments, interconnections, and water quality in the City. The status of each aspect of the IDDE program will be reported in the annual report, and the IDDE Program will be updated to reflect reprioritizations, mapping, and other gathered data.

**Table 8** summarizes requirements for MCM 3. The measurable goals consist of completing the requirements as outlined in the IDDE Program. The success of each BMP will be measured and evaluated

against the metrics provided in the “Measurable Goal” category below. Data collected for each BMP is recorded by the Utility and reported as part of defined reporting requirements.

**Table 8: MCM 3, Illicit Discharge Detection and Elimination (IDDE)**

BMP #	BMP Media/Category	BMP Description	BMP Purpose	Targeted Audience	Responsible Department/Parties	Measurable/Deliverable Goal
3-1	Ordinance Update	Develop and make effective an IDDE ordinance or other regulatory mechanism to effectively prohibit non-stormwater discharges to the MS4 and implement appropriate enforcement actions.	To afford the Utility the authority needed to execute the IDDE Program.	Residents, Business, and Commercial	Utility	Chapter 272 Part 6 of City Ordinance updated with respect to IDDE control.
3-2	IDDE Program Plan Updates	Update IDDE Program documentation as necessary to reflect progress and changes based on results obtained over the course of plan implementation.	To ensure that a progressive and successful IDDE Program is in effect.	Residents, Business, Institutions, and Commercial	Utility	Updated IDDE Program submitted to regulators as changes are made. Up-to-date IDDE Program hosted on City's website.
3-3	Sanitary Sewer Overflow (SSO) Inventory	Maintain updated list and documentation of SSOs in Lowell.	To develop a better understanding of SSOs in Lowell, their impact to the local MS4, and to better prioritize solution-oriented efforts to resolve underlying causes of SSOs.	Residents, Business, Institutions, and Commercial	Utility	Updated SSO list to be included as part of IDDE Program submittal updates. List # of SSOs (including dates) during the reporting term.
3-4	Dry/Wet Weather Outfall Screening and Sampling	Screen and sample all known municipal outfalls during both dry and wet weather conditions. Sample and analyze all observed flows to be leaving municipal outfalls during these screenings. Prioritize follow-up catchment investigations based on the results of these screenings.	To identify Potential Illicit Discharges impacting Lowell's MS4 To better understand the state of the municipal drainage system.	Residents, Business, Institutions, and Commercial	Utility	# of outfalls screened during dry and wet weather conditions during the reporting term. Sampling results obtained through this effort will be shared as part IDDE Program submittal updates.
3-5	Catchment Investigations/Mapping	Investigate catchments with observed Potential Illicit Discharges based in priority order to locate source following protocol described in IDDE Program. Map key municipal drainage structures as part of this process.	To locate the source of Potential Illicit Discharges uncovered during outfall screening/sampling. To better understand the state of the municipal drainage system.	Residents, Business, Institutions, and Commercial	Utility	# of catchments investigated during the reporting term. # of key drainage structures mapped during the reporting term. Results obtained through this effort will be shared as part IDDE Program submittal updates.
3-6	Illicit Discharge Elimination and Removal	Eliminate confirmed Illicit Discharges located during catchment investigations following protocol described in IDDE Program.	To eliminate verified Illicit Discharges located in the municipal drainage system.	Residents, Business, Institutions, and Commercial	Utility	# of illicit discharges (including a narrative description) eliminated during the reporting term. Results through this effort will be shared as part IDDE Program submittal updates.
3-7	IDDE Training	Train municipal staff members on the Utility's IDDE protocols outlined in the IDDE Program.	To improve municipal understanding of the IDDE Program.	Utility	Utility	List of training events (including dates and # of participants) during the reporting term.

## 4.4 MCM 4: CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

Polluted stormwater runoff from construction sites often flows to MS4s and ultimately is discharged into local rivers and streams. Of the major pollutants commonly found on construction sites that impact stormwater, sediment is the primary pollutant of concern. To account for this, Federal regulations require permitted MS4s, like Lowell, to develop, implement, and enforce a program to reduce pollutants in stormwater runoff to their MS4 from construction activities that result in a land disturbance of greater than or equal to one acre, or where the disturbance is less than one acre but is part of a larger common plan of development or sale.

As a NPDES permit holder, the Utility is obligated to ensure that the potential impact of migrating sediment and erosion during larger development is mitigated to the full extent practical, through proper erosion and sedimentation control practices.

### 4.4.1 OBJECTIVE

The City will develop, implement, and enforce a program to reduce pollutants in any stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre and include disturbances of less than one acre if part of a larger common plan.

### 4.4.2 PERMIT SUMMARY

The 2003 Permit requires a construction site stormwater runoff control program and modifications or enhancements that the City has made to address impaired waterbodies and updated regulations. Part II B.4. of the 2003 Permit requires the City to develop and enforce a construction site storm runoff control program to reduce pollutants in construction site runoff. The ordinance and program shall not be applicable for construction sites with a waiver from USEPA under provisions of 40 CFR§122.26(b)(15)(i).

The 2003 Permit requires that the ordinance:

- has monetary and/or non-monetary penalties to ensure compliance.
- requires construction sites to have a sediment and erosion control plan with appropriate BMPs, including efforts to limit the area of disturbance.
- requires construction sites to control all wastes generated at the construction site, including, but not limited to, sanitary, demolition debris, litter, and chemical wastes.

The 2003 Permit requires that the City's program includes:

- procedures for preconstruction site plans review.
- procedures for receipt and consideration of public comments.
- procedures for construction site inspections, and enforcement of control measures.

The following elements must be reviewed during the preconstruction site plan review:

- planned BMPs during construction.
- planned BMPs for post-construction conditions.
- evaluating the incorporation of LID site planning and design strategies.

### 4.4.3 BEST MANAGEMENT PRACTICES

The Utility is updating the existing stormwater management ordinances to give the City greater authority to enforce a construction site control measures. The updated ordinance establishes erosion and sedimentation control measures through the following amendments:

- By defining what constitutes an Erosion and Sedimentation Control Plan (§272-109.).
- By defining the conditions where development within the City shall require erosion and sedimentation control measures, in line with Federal and State requirements and practices (§272-110.A.), (§272-110.A.(1)).
- By establishing a Stormwater Management Permit, issued by the Enforcement Authority, as the regulatory mechanism in place to manage and enforce erosion and sedimentation control measures (§272-110.A.).
- By establishing the requirements that must be met for a developer to obtain a Stormwater Management Permit (§272-112.A.).
- By establishing the contents of an Erosion and Sedimentation Control Plan (§272-112.A.(1)(a)).
- By establishing the authority needed by the Enforcement Authority to investigate and inspect any property subject to a Stormwater Management Permit as needed for compliance (§272-114.C.), (§272-114.D.).
- By permitting the Enforcement Authority to issue a written order to enforce provisions of the ordinance to persons found to be in violation thereof (§272-115.A.).

**Table 9** details the City's Construction Site Stormwater Runoff Control program. The success of each BMP will be measured and evaluated against the metrics provided in the "Measurable Goal" category below. Data collected for each BMP is recorded by the Utility and reported as part of defined reporting requirements.

**Table 9: MCM 4, Construction Site Stormwater Runoff Control Program**

BMP #	BMP Media/Category	BMP Description	BMP Purpose	Targeted Audience	Responsible Department/Parties	Measurable/Deliverable Goal
4-1	Ordinance Update	Develop and make effective an ordinance to require sediment and erosion control at construction sites.	To afford the Utility the authority needed to implement construction site stormwater runoff control measures.	Residents, Business, and Commercial	Utility	Update Chapter 272 Part 6 of City Ordinance with respect to sediment and erosion control.
4-2	Sediment and Erosion Control Application – Stormwater Permit Issuance	Continue to apply Standard 8 of MA Stormwater Policy, in line with Lowell’s updated construction site stormwater runoff control ordinance.	To reduce pollutants in stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre, or where the disturbance is less than one acre, but is part of a larger common plan of development or sale.	Residents, Business, and Commercial	Utility, Conservation Commission	# of projects that go before Lowell’s conservation commission for review during the reporting term. # of projects subject to sediment and erosion control measures during the reporting term. # of stormwater management permits issued for projects subject to sediment and erosion control measures during the reporting term.
4-3	Construction Site Inspections	Inspect sites subject to sediment and erosion control measures during construction to ensure proper function. Enforce ordinance and corrective measures, as necessary.	To reduce pollutants in stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre, or where the disturbance is less than one acre, but is part of a larger common plan of development or sale.	Residents, Business, and Commercial	Utility, City Engineering	# of sites inspected during the reporting term. # of ordinance violations observed during reporting term. # of corrective measures enforced during reporting term.

## 4.5 MCM 5: POST CONSTRUCTION STORMWATER MANAGEMENT

Post-construction stormwater management in areas undergoing new or redevelopment helps control pollutants in runoff from these areas. Prior planning and design will minimize pollutants in post-construction stormwater discharges in the most cost-effective manner for stormwater quality management.

### 4.5.1 OBJECTIVE

The City of Lowell will develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, or where the disturbance is less than one acre but is part of a larger common plan of development, and discharges into the municipal system.

### 4.5.2 PERMIT SUMMARY

The 2003 Permit requires post-construction stormwater management in new development and redevelopment to address impaired waterbodies and updated regulations. Part II B.5. of the 2003 permit requires the City to develop and make effective an ordinance that will address post construction runoff from new development and redevelopment projects that result in land disturbance of greater than or equal to one acre, or where the disturbance is less than one acre, but is part of a larger common plan of development or sale.

The City must require that qualifying new development and redevelopment stormwater management BMPs be optimized for phosphorus removal as a part of the Phosphorus Control Plan. The City will enhance this permit requirement by updating ordinances to require developers to incorporate low impact design (LID) site planning and design strategies to the maximum extent practicable. The program must ensure applicants can provide adequate long-term operation and maintenance of installed BMPs, and that controls be installed that will prevent or minimize water quality impacts.

The City will enhance this permit requirement by requiring developers, at a minimum, to submit as-built drawings no later than six (6) months after completion of construction projects. The as-built drawings must depict structural and non-structural on-site controls. The City will also require owners of private stormwater management systems to submit ownership agreements and procedures for the long-term operation and maintenance of stormwater BMPs.

### 4.5.3 BEST MANAGEMENT PRACTICES

The Utility is updating the existing stormwater management ordinances to give the City greater authority to enforce a construction site control measures. The updated ordinance establishes erosion and sedimentation control measures through the following amendments:

- By defining the conditions where development within the City shall require post-construction stormwater management control measures, in line with Federal and State requirements and practices (§272-110.A.), (§272-110.A.(1)).

- By establishing a Stormwater Management Permit, issued by the Enforcement Authority, as the regulatory mechanism in place to manage and enforce post-construction stormwater management control measures (§272-110.A.).
- By establishing the requirements that must be met for a developer to obtain a Stormwater Management Permit (§272-112.A.).
- By establishing the contents of an Erosion and Sedimentation Control Plan, Stormwater Management Plan, and Operation & Maintenance Plan (§272-112.A.(1)(a-c)).
- By establishing Post Development Design Standards (§272-112.A.(2)), including:
  - That they be in accordance with Massachusetts State standards (§272-112.A.(2)(a));
  - That low-impact development (LID) techniques within stormwater management design are encouraged to be used to the maximum extent practicable (§272-112.A.(2)(b));
  - That stormwater management systems required for post-construction runoff control be designed to meet an average annual pollutant removal in accordance with Massachusetts State standards, including proper stormwater best management practices selection and stormwater runoff volume retention (§272-112.A.(2)(c)).
- By granting the Enforcement Authority the right to require a surety or cash bond as a means of security for land disturbing activities.
- By establishing the authority needed by the Enforcement Authority to investigate and inspect any property subject to a Stormwater Management Permit as needed for compliance (§272-114.C.), (§272-114.D.).
- By permitting the Enforcement Authority to issue a written order to enforce provisions of the ordinance to persons found to be in violation thereof (§272-115.A.).

**Table 10** details the Post Construction Stormwater Management for New Development and Redevelopment. The success of each BMP will be measured and evaluated against the metrics provided in the “Measurable Goal” category below. Data collected for each BMP is recorded by the Utility and reported as part of defined reporting requirements.

**Table 10: MCM 5, Post Construction Stormwater Management**

BMP #	BMP Media/Category	BMP Description	BMP Purpose	Targeted Audience	Responsible Department/Parties	Measurable/Deliverable Goal
5-1	Ordinance Update	Develop and make effective an ordinance to address post-construction runoff from new development and redevelopment.	To afford the Utility the authority needed to implement post-construction runoff stormwater runoff control measures for qualifying new development and redevelopment projects. More information as to how this BMP is part of the Utility's plan to minimize phosphorus in stormwater can be found in <b>Section 6.1.1.</b>	Residents, Business, and Commercial	Utility	Update Chapter 272 Part 6 of City Ordinance with respect to post-construction stormwater runoff control.
5-2	Post-Construction Stormwater Runoff Control Application	Apply post-construction stormwater runoff control measures to construction activities that result in a land disturbance of greater than or equal to one acre, or where the disturbance is less than one acre, but is part of a larger common plan of development or sale.	To reduce pollutants in stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre, or where the disturbance is less than one acre, but is part of a larger common plan of development or sale.	Residents, Business, and Commercial	Utility	# of projects subject to post-construction stormwater runoff control measures during the reporting term. # of stormwater management permits issued for projects subject to post-construction stormwater runoff control measures during the reporting term.
5-3	Post-Construction Stormwater Runoff Control As-built Plans	Require as-built records to be submitted within six months of construction.	To reduce pollutants in stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre, or where the disturbance is less than one acre, but is part of a larger common plan of development or sale.	Residents, Business, and Commercial	Utility, DPD	# of as-built records received during the reporting term.
5-4	Post-Construction Stormwater Runoff Control Site Inspections	Inspect sites subject to post-construction stormwater runoff control measures, as needed, to ensure proper function. Enforce ordinance and corrective measures, as necessary.	To reduce pollutants in stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre, or where the disturbance is less than one acre, but is part of a larger common plan of development or sale.	Residents, Business, and Commercial	Utility, City Engineering	# of sites inspected during the reporting term. # of ordinance violations observed during reporting term. # of corrective measures enforced during reporting term.

## 4.6 MCM 6: POLLUTION PREVENTION / GOOD HOUSEKEEPING

### 4.6.1 OBJECTIVE

The City of Lowell will develop and implement a program to prevent or reduce runoff pollutants from municipal operations. The program will include inspection procedures and an employee training component.

### 4.6.2 PERMIT SUMMARY

Part II B.6. of the 2003 Permit requires that good housekeeping and pollution prevention programs be developed for the following municipal owned facilities and property (at a minimum):

- Material storage yards
- New construction and land disturbance
- Roadway drainage system maintenance
- Stormwater system maintenance
- Parks and open spaces
- Schools
- Town offices
- Police and fire stations
- Municipal pools and parking garages
- Other City-owned buildings where pollutants are exposed to stormwater runoff

For those City properties that contain vehicle and equipment maintenance operations, programs must be developed with the goal of preventing or reducing pollutant runoff from the site and must include employee training.

For all components of the good housekeeping program, a schedule for implementation needs to be developed that includes maintenance activities, inspections, and plans for long-term structural controls. Inspection procedures are likewise to be developed for all municipal properties requiring good housekeeping measures.

In addition to the requirements of the 2003 Permit, the 2023 CD required additional provisions (including the Phosphorus Control Plan and other impairments requirements) include additional good housekeeping requirements that fall under MCM 6 as follows:

- Continue street sweeping for all municipal owned streets and parking lots (with the exception of rural uncurbed roads with no catch basins or high-speed limited access highways) at a minimum of two times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sep 1 – Dec 1; following leaf fall).
- Establish procedures to properly manage grass cuttings and leaf litter on City property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces.

### 4.6.3 BEST MANAGEMENT PRACTICES

A Good Housekeeping Manual incorporating written procedures for municipal activities, written inventory of all City owned facilities, and good housekeeping procedures for parks, open spaces, municipal buildings/facilities, vehicles, and equipment has been developed (Appendix B); good housekeeping procedures for catch basin cleaning, street sweeping, proper management of sweepings and cleanings, use of sand for winter road maintenance, and structural controls for maintenance of stormwater BMPs have also been included. The manual will serve as the City's reference for all Good Housekeeping and Pollution Prevention activities that municipal employees perform. The manual will be updated on an as needed basis to best meet the City's needs. It will be updated to include a proposed schedule for all required inspections and regular maintenance activities.

The City has ongoing pollution prevention and good housekeeping practices that were created at the adoption of the 2003 Permit, which will be continued and expanded upon as part of this SWMP. For all existing procedures being executed, written procedures and schedules for implementation will be included in the Good Housekeeping manual.

Additionally, for municipal owned facilities that pose a particularly high risk for stormwater pollution (e.g. facilities that have the potential for leaks, spills, and other releases that may be exposed to stormwater, parks and open space with fertilizer storage, parking garages storing petroleum products, municipal buildings storing winter road maintenance supply etc.), Stormwater Pollution Prevention Plans (SWPPPs) will be developed that outline facility-specific procedures to avoid potential pollution of the MS4 system.

To date, the City has developed a SWPPP for the Duck Island Wastewater Treatment Plant facility.

All SWPPPs are required to include:

- Pollution Prevention Team
- Description of facility and potential pollutant sources
- Identification of stormwater controls
- Pollution management practices:
  - Minimize or prevent exposure
  - Good housekeeping
  - Preventative maintenance
  - Spill prevention and response
  - Erosion and sediment control
  - Management of runoff
  - Employee training
  - Maintenance of control measures

A summary of existing Good Housekeeping and Pollution Prevention programs is outlined in **Table 11**.

Table 11: MCM 6, Pollution Prevention / Good Housekeeping Program

BMP #	BMP Media/Category	BMP Description	BMP Purpose	Targeted Audience	Responsible Department/Parties	Measurable/Deliverable Goal
6-1	Catch Basin Cleaning Program	Conduct ongoing catch basin cleaning.	To ensure that catch basins are free of debris and can effectively collect and convey stormwater runoff. To mitigate pollutants impacting the MS4.	Municipality, Residents, Business, and Commercial	Utility, DPW	# of catch basins cleaned during the reporting term.
6-2	Street Sweeping Program	Conduct street sweeping of all municipal owned streets and parking lots at a minimum frequency of twice per year.	To reduce pollutants in stormwater runoff to the MS4 from municipal roadways and parking lots. More information as to how this BMP is part of the Utility's plan to minimize phosphorus in stormwater can be found in <b>Section 6.1.1.</b>	Municipality, Residents, Business, and Commercial	DPW, Utility	Mileage of streets swept during the reporting term.
6-3	Salting and Snow Removal Practices	Continue existing programs for salt storage/use and management, especially in sensitive areas.	To reduce pollutants in stormwater runoff to the MS4 from municipal paved areas.	Municipality, Residents, Business, and Commercial	DPW, Utility	Continue existing program.
6-4	Park and Landscape Maintenance	Minimize the application of herbicides, pesticides, and fertilizers on city-owned land. Establish practices for managing grass clippings and leaf litter on all City owned property.	To reduce pollutants in stormwater runoff to the MS4 from municipal parks and landscaped areas. More information as to how this BMP is part of the Utility's plan to minimize phosphorus in stormwater can be found in <b>Section 6.1.1.</b>	Municipality, Residents	DPW, Parks Department	Continue existing program.
6-5	Municipal Stormwater Pollution Prevention Plans (SWPPPs)	Develop and implement Stormwater Pollution Prevention Plans for qualifying municipal properties.	To reduce pollutants in stormwater runoff to the MS4 from qualifying municipal properties.	Municipality	Utility, DPW, Water Department	Results from SWPPP inspections completed during the reporting term.
6-6	Employee Training	Train municipal staff members on topics relevant to stormwater quality	To improve municipal understanding of the SWMP.	Municipality	Utility	List of training events (including dates and # of participants) during the reporting term.

## 5 MERRIMACK RIVER PHOSPHORUS IMPAIRMENT

The 2023 CD required the City to perform additional provisions to address phosphorus impairments. The Merrimack River is classified as impaired for phosphorus on the applicable USEPA-approved Massachusetts CWA § 303(d) Integrated List of Waters and does not have an USEPA approved Total Maximum Daily Load. As such, the Utility must identify and implement BMPs designed to reduce phosphorus discharges to the Merrimack River and its local tributaries.

### 5.1 Enhanced Phosphorus Control BMPs

The City has identified BMPs designed to reduce phosphorus discharges to waterbodies, and/or their tributaries. More details related to these BMPs can be found in **Section 7** of this SWMP.

#### ***Targeted Messaging (BMP 1-3):***

The City shall distribute an annual message in the spring (March/April) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release and phosphorous-free fertilizers. The City shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The City shall distribute an annual message in the fall (August/September/ October) timeframe encouraging the proper disposal of leaf litter. For enhanced new development and redevelopment stormwater management, the Utility is updating ordinances or modify regulatory mechanisms to ensure that new development or redevelopment stormwater BMPs are optimized for phosphorus removal, where applicable. For implementation of good housekeeping and pollution prevention BMPs, the City will use strategies to manage grass cuttings and leaf litter on City property, and complete street cleanings after leaf fall in the fall (Sept 1 – Dec 1) and after winter sanding in the spring.

#### ***Stormwater Management in New Development and Redevelopment Ordinance Update (BMP 5-1):***

The Utility shall develop and make effective an ordinance to address post-construction runoff from new development and redevelopment and include a requirement that new development and redevelopment stormwater management BMPs be optimized for phosphorus removal.

#### ***Good House Keeping (BMPs 6-2 & 6-4):***

The City shall establish procedures to properly manage grass cuttings and leaf litter on City property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; increased street sweeping frequency of all municipal owned streets and parking lots (with the exception of rural uncurbed roads with no catch basins or high speed limited access highways) to a minimum of two times per year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

### 5.2 Phosphorus Source Identification Report

The City will complete a Phosphorus Source Identification Report by December 31, 2025 to identify catchments with high phosphorus loading and to identify potential retrofit opportunities for the installation of structural BMPs during re-development. The report will include the following elements:

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

This Phosphorus Source Identification Report shall be submitted to USEPA in the January 31, 2026, Compliance Report.

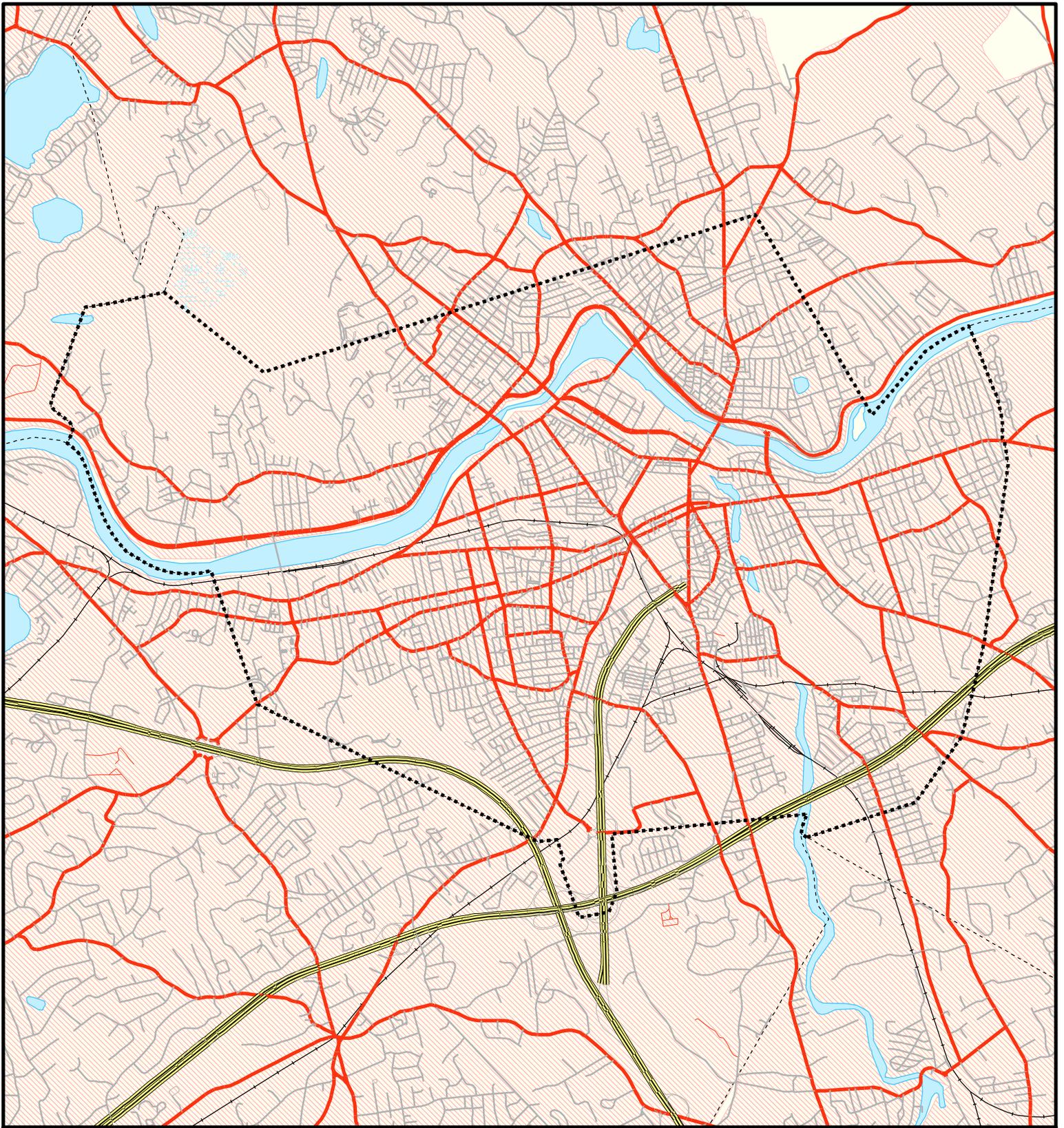
### **5.3 Phosphorus Source BMP Project**

The City will evaluate all permittee-owned properties or those identified in the Phosphorus Source Identification Report that could potentially be modified or retrofitted with BMPs designed to reduce the frequency and pollutant loads of stormwater discharges to and from its MS4 by December 31, 2026. The evaluation will include:

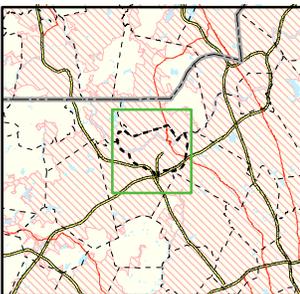
- a. the next planned infrastructure, resurfacing or redevelopment activity planned for the property (if applicable) or planned retrofit date;
- b. the estimated cost of redevelopment or retrofit BMPs; and
- c. the engineering and regulatory feasibility of redevelopment or retrofit BMPs.

The City will prepare a list of planned structural BMPs and an implementation plan and schedule which will be included in the January 31, 2027 Compliance Report. The City will plan and install a minimum of one structural BMP as a demonstration project within the drainage area of the water quality limited water or its tributaries by December 31, 2027. The demonstration project will be installed targeting a catchment with high phosphorus load potential. The City will install the remainder of the structural BMPs in accordance with the plan and schedule provided in the January 31, 2027, Compliance Report. The City will document details of any structural BMP (BMP type, total area treated by the BMP, the design storage volume of the BMP) and estimate the phosphorus removal by the BMP.

## **APPENDIX A: EPA MAP**



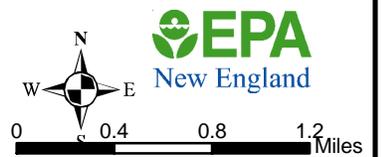
Area of Focus:



**NPDES Phase II Stormwater Program  
Automatically Designated MS4 Areas**  
*Lowell, Massachusetts*

-  Lowell Town Boundary
-  Regulated Area (2000 Urbanized Area)

Town Population: 105,167  
Regulated Population: 104,937



Data Sources: Urbanized Areas from US Census Bureau (2000). Political boundaries from MassGIS. Hydrography from NHD. Transportation data from GDT at 1:24,000. Map Created: 11/13/02; US EPA- New England GIS Center L:/projects/stormwater/phase2/matowns/new/

## **APPENDIX B: GOOD HOUSEKEEPING MANUAL**

---

# City of Lowell

---

## GOOD HOUSEKEEPING MANUAL: FULL VERSION

---

A Guide to Good Housekeeping Best  
Practices to Prevent Stormwater  
Pollution

December 2023

---



# CITY *of* LOWELL



## Table of Contents

Introduction .....	3
Best Management Practices (BMP) Sheets .....	6
BMP 1 – Road Sand/Salt Application and Storage .....	7
BMP 2 – Snow Stockpiling/Removal .....	10
BMP 3 – Materials Management .....	13
BMP 4 – Hazardous Material Storage .....	17
BMP 5 – Vehicle Fueling, Maintenance, and Storage .....	22
BMP 6 – Vehicle Washing .....	26
BMP 7 – Spill Prevention and Response .....	29
BMP 8 – Lawn and Grounds Maintenance .....	34
BMP 9 – Street and Parking Lot Sweeping .....	38
BMP 10 – Catch Basin Cleaning .....	43
BMP 11 – Pet Waste, Waterfowl, and Litter Management .....	49
BMP 12 – Waste Management .....	52
BMP 13 – Building Operations .....	57
BMP 14 – Oil/Water Separators .....	60
BMP 15 – Bio-Retention .....	63
BMP 16 – Stormwater Maintenance, Sanitary, and Water Line Repair .....	67

## Appendix

- A. SWPPP Facility Inventory
- B. MS4 City-Owned Facilities Map
- C. Facility Inspection Log

# Introduction

## 2003 MS4 Permit

The 2003 Municipal Separate Storm Sewer System (MS4) Permit requires that the City of Lowell address six (6)

Minimum Control Measures (MCMs). These measures include the following:

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

As part of MCM6, the City has updated its January 2023 Good Housekeeping Manual to develop a December 2023 document, which includes general written operations and maintenance procedures for the municipal operations at city owned facilities not under a site-specific SWPPP plan or Multi-Sector General Permit (MSGP) .

Beyond maintaining these properties, the City is also responsible for keeping all MS4 infrastructure in good working order. The City has developed a written program detailing operation and maintenance for that MS4 infrastructure which is included in this Good Housekeeping Manual.

## How to Use this Manual

The pollution prevention and good housekeeping controls outlined in this document and referred to as best management practices (BMPs), are standard operating procedures for City personnel and for use at all applicable City- owned facilities and drainage infrastructure within the MS4. These BMPs are intended to serve as guidance on good housekeeping practices as they relate to reducing pollutants in runoff from municipal operations.

Each of the BMP fact sheets provides a description of the practice, the pollution prevention approach, suggested practices, inspection procedures, and maintenance procedures. For those tasks that have a regulatory reporting component (e.g. volume of material removed from a catch basin), appropriate tracking log examples or inspection forms are included. These logs/forms will facilitate compilation of data required for National Pollutant Discharge Elimination System (NPDES) annual reporting.

The BMP fact sheets provide Targeted facilities and operations, which include types of common facilities found in Lowell, such as public school properties, police and fire departments, parks and recreation spaces, City-owned

buildings, and parking lots and garages, as well as municipal activities that take place throughout the City. Examples of these types of City-wide activities include roadway and drainage system maintenance. The potential pollutants associated with these targeted facilities and operations are identified below this list as Targeted constituents on each BMP fact sheet.

### Manual Updates

This Manual is intended to be a ‘living document’ that is updated as necessary to meet the City’s needs while striving to reduce pollution “to the maximum extent practicable” under the NPDES MS4 Permit.

Under each BMP, a space for “Notes / Specific Procedures” has been included so that unique conditions, problem areas, protocol specifics, or changes can be documented by the City.

### Annual Reporting

This document, as updated, should be included in the Annual Reports provided to the Massachusetts Department of Environmental Protection (MassDEP) and the United States Environmental Protection Agency (US EPA). Note that specific BMPs (such as the catch basin cleaning and street sweeping BMPs) are required elements of the Permit and specific data pertinent to execution of these tasks must be reported in the Annual Report.

### Document Limitations; Other Regulatory Requirements

It should be noted that this document outlines best practices and procedures but does not include all best management practices required for the Duck Island Lowell Regional Wastewater Utility, etc. which requires a written Stormwater Pollution Prevention Plan (SWPPP) under this Permit or under the Multi-Sector General Permit (MSGP), which has additional requirements not included in this document. Lastly, facilities adjacent to wetlands may have Wetlands Protection Act Orders of Conditions for certain maintenance activities in proximity to wetland resources.



# Best Management Practices (BMP) Sheets

# BMP 1 – ROAD SAND/SALT APPLICATION AND STORAGE

## **DESCRIPTION**

Lowell's current policy is to use sand on streets and City-owned parking lots. Currently, road sand is stored at a salt barn near Lowell's landfill. The wastewater and drinking water departments each store their road sand and/or salt in their own respective salt barns for operational use. Proper storage is necessary to prevent contamination to surface and ground water supplies. Some sands may contain salts to help de-ice roads. Salts are very soluble—once in contact with water there is no way to remove salt. The major reasons for keeping salt covered and controlling use are that salt:

- Kills vegetation
- Corrodes infrastructure
- Blocks storm drains and swales
- Increases sedimentation to streams and rivers
- Small quantities (5% road salt) contain phosphorus, nitrogen, copper, and cyanide

## **POLLUTION PREVENTION APPROACH**

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater system to the maximum extent practicable.

## **SUGGESTED BEST MANAGEMENT PRACTICES**

### **Proper Storage**

Storage Facilities for salt and sand/salt mixtures should have the following key elements:

- Covered structures on impervious surfaces.
- Drainage should be diverted away from storage facility.
- Sand/salt handling should be done within storage facility.
- Should not be located in a water supply watershed or within 100- year floodplain.

### **Proper Disposal**

Disposal of sand/salt mixtures should not be done in the following areas:

- Wetlands
- Any surface waters

## **TARGETED FACILITIES AND OPERATIONS**

- All City-Owned Facilities with walkways or vehicle parking including, but not limited to: Schools, Parking lots, etc.
- Facilities that store salt or sand
- Street Rights-of-Way

## **TARGETED CONSTITUENTS**

- Salt
- Metals
- Nutrients
- Low Dissolved Oxygen
- TSS/TDS/Sediment
- Oil & Grease

## **REFERENCE**

- MassDEP Guidelines on Road Salt Storage (Updated January 1996):  
<https://www.mass.gov/guides/guidelines-on-road-salt-storage#-salt-storage-best-management-practices->

## **NOTES / SPECIFIC PROCEDURES:**

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

## BMP 1 – ROAD SAND/SALT APPLICATION AND STORAGE

- Well locations and public drinking supplies

### Proper Removal

- Street cleaning of all City roadways twice per year.
- Catch basin cleaning completed as necessary to ensure that no catch basin within the MS4 is ever greater than 50% full.
- Establish a low salt/sand area near any water bodies or residential areas.
- Regulate the amount of road salt/sand applied to prevent over- salting or sanding of motorways and increasing runoff concentrations.
- Vary the amount of salt/sand applied to reflect site-specific characteristics, such as road width and design, traffic concentration, and proximity to surface waters.
- Provide calibration devices for spreaders in trucks to aid maintenance workers in the proper application of road salts/sand.
- Establish air temperature and snow depth conditions favorable for successful use of salt.
- Use alternative materials/mixes, such as sand or gravel heavy mixtures, in especially sensitive areas.
- Use environmentally friendly products alternative to traditional deicing salt.

### INSPECTION PROCEDURES

- Inspect salt/sand storage shed for leaks on a regular basis including Fall and Spring.
- Inspect salt/sand application equipment including calibration equipment and spreaders.
- Inspect salt/sand regularly for lumping or water contamination.
- Inspect surface areas for evidence of runoff – salt stains or sand washout trails in ground near and around the salt/sand storage shed, loading area, or downslope.
- Inspect for excessive amounts of salt/sand on roads.

### MAINTENANCE PROCEDURES

- Service trucks and calibrated spreaders/sanders regularly to ensure accurate, efficient distribution of salt and sand.

## BMP 1 – ROAD SAND/SALT APPLICATION AND STORAGE

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• Educate and train operators on hazards of over-salting/sanding roads and environment at the beginning of the snow season as part of meetings with supervisors and drivers.</li><li>• Repair salt/sand storage shed leaks.</li></ul> |  |
|---|--|



MAINTENANCE LOG BMP 1 - Road Sand/Salt Application & Storage

Maintenance Records (copy information below for each control measure) **Example**

Equipment: **FRHT Sander**

Regular Maintenance Activities: **Check sand distribution, check fluids in vehicle.**

Regular Maintenance Schedule: **Regularly during winter season.**

Date of Action: **November 2021.**

Reason for Action:      Regular Maintenance  Discovery of Problem

If Problem,

- Description of Action Required: **No issues noted.**

- Date Fixed:

- Justification if Maintenance Schedule Extended:

Notes:

Maintenance Records (copy information below for each control measure)

Equipment:

Regular Maintenance Activities:

Regular Maintenance Schedule:

Date of Action:

Reason for Action:      Regular Maintenance  Discovery of Problem

If Problem,

- Description of Action Required:

- Date Fixed:

- Justification if Maintenance Schedule is Extended:

Notes:

**DESCRIPTION**

Proper snow management in terms of stockpiling and removal can prevent or minimize runoff and pollutant loading impacts. Snow piles can contain trash, nutrients, sediments, salt, sand, and vehicle pollutants (petroleum, antifreeze, and oil) that can directly be carried into surface waters during snowmelt.

**POLLUTION PREVENTION APPROACH**

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

**SUGGESTED BEST MANAGEMENT PRACTICES**

The City does not regularly stockpile snow. During extreme conditions when stockpiling is necessary, the following practices should be applied:

- Do not stockpile snow near or within direct drainage to surface waters.
- Do not stockpile snow in wooded areas, around trees, or in vegetated buffer zones due to sediment and salt damage to vegetation.
- Stockpile snow in pervious areas where it can slowly infiltrate.
- During plowing activities on pervious surfaces, blading (plow lowers blade below ground surface level and plows the upper layers of soil in addition to overlying snow) should be avoided to prevent erosion.
- Do not dispose of snow into waters of the United States. Snow disposal sites, including selection of appropriate snow disposal sites, will adhere to the Massachusetts Department of Environmental Protection Snow Disposal Guidance (Effective Date: December 11, 2020).

**INSPECTION PROCEDURES**

- Check snow piles for debris that could be windblown.

**MAINTENANCE PROCEDURES**

- Contain sediments as snow melts and removed every Spring from snow storage areas. This includes sweeping roadways and parking lots or other impervious areas.
- During plowing activities, avoid blocking drainage

**TARGETED FACILITIES AND OPERATIONS**

- Street Rights-of-Way
- All City-Owned Facilities with walkways or vehicle parking including, but not limited to: Schools, Parking lots, etc.
- Highway Department Services

**TARGETED CONSTITUENTS**

- Sediment
- Salt
- Nutrients
- Trash
- Oil & Grease

**REFERENCE**

- Mass.gov Snow Disposal Guidance: <https://www.mass.gov/guides/snow-disposal-guidance>

**NOTES / SPECIFIC PROCEDURES:**

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

**BMP 2 - SNOW STOCKPILING/REMOVAL**

structures including catch basins, swales, and channels.	
--	--



## BMP 3 - MATERIALS MANAGEMENT

### **DESCRIPTION**

Materials management entails the selection of the individual product and quantity, the correct use and storage of the product, and the proper disposal of associated waste(s). It is important to be responsible with common chemicals and solvents including paints, cleaners, and automotive products to reduce contamination to stormwater runoff.

### **POLLUTION PREVENTION APPROACH**

Proper management reduces the likelihood of accidental spills or releases of hazardous materials into storm drains or during storm events. In addition, health and safety conditions at the facility will improve.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

### **SUGGESTED BEST MANAGEMENT PRACTICES**

#### **Material Inventory**

- Identify all hazardous and non-hazardous substances by reviewing purchase orders and conducting a walk-through of each City facility.
- Compile Material Safety Data Sheets (MSDS) for all chemicals. These should be readily accessible to all facility employees and submitted to the Lowell Fire Department when applicable.
- Label all containers of significant materials that include cleaners, fuels, and other hazards.
- Identify handling, storage, and disposal requirements of all chemicals.
- Use environmentally friendly or non-hazardous substitutes when appropriate that include but not limited to H2Orange2, Orange Thunder, and Simple Green®.
- Keep hazardous materials and waste off the ground.
- All drums and containers should be in good condition and properly labeled.
- Loose materials including any gravel piles should be covered or placed in shelter when possible.

### **TARGETED FACILITIES AND OPERATIONS**

- All City-Owned Facilities
- All City-Owned Parks and Open Spaces
- All Fleet Vehicle and Equipment Operations

### **TARGETED CONSTITUENTS**

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

### **NOTES / SPECIFIC PROCEDURES:**

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

## BMP 3 - MATERIALS MANAGEMENT

### **Solid Waste**

- Trash storage bins, dumpsters, and disposal areas should be clean and free of debris, especially those located near catch basins.
- Dumpsters should be maintained in good condition, inspected regularly, and securely closed at all times.
- All equipment and materials should be stored properly, and work areas should be kept clean.



MAINTENANCE LOG BMP 3 - Materials Management

Maintenance Records (copy information below for each control measure) **Example**

Control Measure or Equipment: **Waste materials collecting in workspace.**

Regular Maintenance Activities: **Maintain clean work area and dispose of waste properly.**

Regular Maintenance Schedule: **As needed.**

Date of Action: **June 2, 2021**

Reason for Action:      Regular Maintenance  Discovery of Problem

If Problem,

- Description of Action Required: **Remove collected waste.**

- Date Fixed: **Immediately; June 2, 2021**

- Justification if Maintenance Schedule Extended:

Notes:

Maintenance Records (copy information below for each control measure)

Control Measure or Equipment:

Regular Maintenance Activities:

Regular Maintenance Schedule:

Date of Action:

Reason for Action:      Regular Maintenance  Discovery of Problem

If Problem,

- Description of Action Required:

- Date Control Measure Returned to Full Function:

- Justification for Extended Schedule, if applicable:

Notes:

## BMP4 - HAZARDOUS MATERIAL STORAGE

### **DESCRIPTION**

It is important to properly store hazardous materials to prevent them from contaminating stormwater runoff. Common hazardous materials that may be present in City-owned facilities within the MS4 include:

- Cleaning agents: solvents, drain cleaners, and bleach
- Vehicle maintenance fluids: motor oil, gasoline, antifreeze, degreasers, and radiator flush
- Water treatment chemicals
- Paints

### **POLLUTION PREVENTION APPROACH**

Proper management reduces the likelihood of accidental spills or releases of hazardous materials during storm events. In addition, health and safety conditions at the facility will improve.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

### **SUGGESTED BEST MANAGEMENT PRACTICES**

#### **Loading/Unloading**

- All facilities should have proper procedures in place for loading and/or unloading hazardous materials, especially in areas located near catch basins.
- Do not conduct loading and unloading of exposed hazards during wet weather, whenever possible.
- Load and unload only at designated loading areas.
- If feasible, load and unload all materials and equipment in covered areas such as building overhangs at loading docks.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections.

#### **Storage**

- When possible, store hazardous materials and wastes indoors.
- Storage of reactive, ignitable, or flammable liquids must comply with the Massachusetts Fire Prevention

### **TARGETED FACILITIES AND OPERATIONS**

- All City-Owned Facilities
- All Fleet Vehicle and Equipment Operations

### **TARGETED CONSTITUENTS**

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

### **REFERENCE**

- Lowell Hazardous Waste Days:  
<https://www.lowellma.gov/213/Hazardous-Waste-Day>

### **NOTES / SPECIFIC PROCEDURES:**

This BMPs may not be enough to meet all regulatory compliance obligations for specific materials, container types (e.g. UST/AST), or volumes of material, kept at municipal facilities. If there are specific regulatory compliance guidelines for a material, those guidelines should supersede this guidance.

## BMP4 - HAZARDOUS MATERIAL STORAGE

Regulations for the Storage of Flammable and Combustible Materials (527 CMR 14.03).

- Place containers in a designated area that is paved, free of cracks and gaps, and impervious, in order to contain leaks and spills. The area should also be covered.
- Provide secondary containment for hazardous materials and waste placed outdoors.
- Keep containers away from high traffic areas.
- Cover all containers and drums or place under shelter, if stored outdoors.
- MSDSs should be supplied for all stored materials at a specific facility, and in readily accessible location for all facility employees.
- Maintain a log inventory of materials stored at the facility.
- Chemicals should be kept in original labeled containers.
- Containers should not be overfilled.
- Store containers on pallets.
- Properly stack containers and drums.
- Storage areas should be enclosed.
- Minimize storage on-site.
- Keep storage areas clean and organized.
- Contractors should be responsible for delivery, storage, and waste disposal practices.
- Containers should not be glass.
- Segregate reactive/incompatible materials (such as chlorine and ammonia).
- Place drip pans under container spouts.
- Install overfill protection on storage tanks/drums.
- Lock storage areas and provide warning signs.

### **INSPECTION PROCEDURES**

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.
- Look for dust or fumes during loading or unloading operations.
- Inspect storage areas regularly for leaks or spills.
- Conduct routine inspections and check for external

## BMP4 - HAZARDOUS MATERIAL STORAGE

corrosion of material containers.

- Check for structural failure, spills and overfills due to operator error, failure of piping system.
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- Visually inspect new tank or container installations for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Replace containers that are leaking, corroded, or otherwise deteriorating with ones in good condition. If the liquid chemicals are corrosive, containers made of compatible materials must be used instead of metal drums.
- Label new or secondary containers with the product name and hazards.

### **MAINTENANCE PROCEDURES**

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks.
- Sweep area regularly with dry broom.
- Conduct major clean-out of loading and unloading area and any sumps annually in the Fall.
- Repair or replace any leaking/defective containers and replace labels as necessary.
- Maintain caps and/or covers on containers.
- Maintain aisle space for inspection of products/wastes.
- Train employees on proper procedures and when new hazardous materials are used.



MAINTENANCE LOG BMP 4 - Hazardous Material Storage

Maintenance Records (copy information below for each control measure) **Example**

Control Measure or Equipment: **Cap on hazardous material container is cracked.**

Regular Maintenance Activities: **Noted during regular work operations. Check hazardous materials containers.**

Regular Maintenance Schedule: **As needed.**

Date of Action: **May 29, 2021**

Reason for Action:      Regular Maintenance  Discovery of Problem

If Problem,

- Description of Action Required: **Replace cracked cap.**
- Date Fixed: **Immediately, May 29, 2021**
- Justification if Maintenance Schedule Extended:

Notes:

Maintenance Records (copy information below for each control measure)

Control Measure or Equipment:

Regular Maintenance Activities:

Regular Maintenance Schedule:

Date of Action:

Reason for Action:      Regular Maintenance  Discovery of Problem

If Problem,

- Description of Action Required:
- Date Fixed:
- Justification if Maintenance Schedule Extended:

Notes:

## BMP5 – VEHICLE FUELING, MAINTENANCE, AND STORAGE

### **DESCRIPTION**

Vehicle repair and service (e.g. parts cleaning and fueling), replacement of fluids (e.g. oil change), and outdoor equipment storage and parking (dripping engines) can impact water quality if stormwater runoff from areas with these activities occurring on them becomes polluted by a variety of contaminants. Spills and leaks that occur during vehicle and equipment fueling can contribute hydrocarbons, oil and grease, as well as heavy metals to stormwater runoff. It only takes 1 gallon of oil to contaminate 1 million gallons of drinking water. Some fueling/transportation facilities may be subject to specific regulations (e.g. SWPPP) requirements. Currently, the City maintains vehicles at the DPW Yard. The fire and police department each have their own garages for maintenance and repair purposes.

### **POLLUTION PREVENTION APPROACH**

It is important to properly store and discard vehicle fluids including oil, transmission fluid, antifreeze, and lubricants to prevent surface and groundwater contamination from spills or improper disposal.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system.

### **SUGGESTED BEST MANAGEMENT PRACTICES**

#### **General Practices**

- Store fluids in labeled, plastic or metal container with a lid away from drains and catch basins.
- Place flammables in a fire safe cabinet.
- Place drip pans under leaking vehicles, valves, spigots, and pumps.
- Routinely check for leaking vehicles.
- Do not do any vehicle maintenance near storm drains.
- Vehicle maintenance should be done in a covered facility.
- Install inlet catch basin equipped with a small sedimentation basin or grit chamber to remove large particles from stormwater in highly impervious areas.

#### **Fueling**

- Ensure that all fueling activities are not conducted near

### **TARGETED FACILITIES AND OPERATIONS**

- All City-owned facilities storing vehicles and equipment

### **TARGETED CONSTITUENTS**

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease (Hydrocarbons)

### **NOTES / SPECIFIC PROCEDURES:**

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

## BMP5 – VEHICLE FUELING, MAINTENANCE, AND STORAGE

storm drains and dry wells or that procedures are in place to control any spills.

- Fuel storage tanks should be placed on impervious surfaces with no cracks or gaps; secondary containment is recommended.
- Provide barriers such as posts, guard rails, or bollards where tanks are exposed, to prevent collision damage with vehicles.
- Post signs at the fuel dispenser or fuel island warning vehicle owners/operators against "topping off" of vehicle fuel tanks.
- Label drains within the facility boundary, by paint/stencil (or equivalent), to indicate whether they flow to an oil/water separator, directly to the sewer, to a storm drain or into a drywall.

### **Vehicle Maintenance**

- Provide a designated area for vehicle maintenance on an impervious surface.
- Keep equipment clean; don't allow excessive build-up of oil and grease.
- If possible, perform all vehicle fluid removal or changing inside or under cover:
- Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, or remove other parts.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave drip pans or other open containers lying around.
- Keep drip pans or containers under vehicles or equipment that might drip during repairs.
- Do not change motor oil or perform equipment maintenance in non-appropriate areas.
- If temporary work is being conducted outside: Use a tarp, ground cloth, or drip pans beneath the vehicle or equipment to capture all spills and drips.
- If equipment (e.g., radiators, axles) is to be stored outdoors, oil and other fluids should be drained first. This is also applicable to vehicles being stored and not used on a regular basis.

## BMP5 – VEHICLE FUELING, MAINTENANCE, AND STORAGE

### **Disposal**

- Recycle or properly dispose of fluids.
- Dump full pans into 55-gallon drums.
- Dispose of debris including oil filters, oil cans, rags, and clean-up supplies.
- Do not dump vehicle fluids down storm drains.
- Interior floor drains should discharge to holding tanks or be sealed.

### **Used Oil**

- Recycle used oil.
- Do not mix wastes with used oil.

### **INSPECTION PROCEDURES**

- Identify locations of floor drains and catch basins and know where they discharge to. Floor drains should be connected to the sanitary sewer system and catch basins should be connected to the drainage system.
- Regularly inspect vehicles and equipment for leaks and repair immediately.
- Inspect fuel storage tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Inspect fueling areas, catch basin inserts, containment areas, and drip pans on a regular schedule.

### **MAINTENANCE PROCEDURES**

- Sweep the maintenance area on a regular basis, if it is paved, to collect loose particles. Wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain.
- Clean oil/water separators, sumps and on-site treatment/recycling units at appropriate intervals.
- Keep ample supplies of spill cleanup materials onsite. Cleanup spills immediately.
- Properly train employees on fueling and handling oil and waste oil.



# BMP 6 - VEHICLE WASHING

## **DESCRIPTION**

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, and suspended solids to stormwater runoff.

## **POLLUTION PREVENTION APPROACH**

If possible, take vehicles to the City's DPW Yard vehicle wash bay or a commercial car wash facility. Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainagesystem.

## **SUGGESTED BEST MANAGEMENT PRACTICES**

### **General**

- Use biodegradable, phosphate-free detergents for washing vehicles as appropriate. Products include Simple Green® biodegradable car wash cleaner.
- Mark the area clearly as a wash area.
- Post signs stating that only washing is allowed in wash area and that discharges to the storm drain are prohibited. Facility employees should know where catch basins are.
- Provide a trash container in wash area.
- Those that use facility to wash vehicles (e.g., students) should be informed of proper washing protocols.
- Vehicle and Equipment Cleaning
- Install sumps or drain lines to collect wash water or construction of a berm around the designated area and grading of the area to collect wash water as well as prevent stormwater run-on.
- Consider washing vehicles and equipment inside the building if washing/cleaning must occur on-site.
- If washing must occur on-site and outdoors:
  - Use designated paved wash areas. Designated wash areas must be well marked with signs indicating where and how washing must be done. This area must be covered or bermed to collect the wash water and graded to direct the wash water to a treatment or

## **TARGETED FACILITIES AND OPERATIONS**

- All City-owned facilities storing vehicles and equipment

## **TARGETED CONSTITUENTS**

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics

## **NOTES / SPECIFIC PROCEDURES:**

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

## BMP 6 - VEHICLE WASHING

disposal facility.

- Cover the wash area when not in use to prevent contact with rainwater.
- Use hoses with nozzles that automatically turn off when left unattended. Use high-pressure, low-volume sprays.
- Perform pressure cleaning and steam cleaning off-site to avoid generating runoff with high pollutant concentrations. If done on-site, no pressure cleaning and steam cleaning should be done in areas designated as protection areas for public water supply.

### **Disposal**

- Filter and recycle wash water if possible.
- If discharging to an oil/water separator, do not use detergents that disperse oil in wash water and make oil/water separators ineffective with oil passing to the sanitary sewer system. It is best to use high pressure water with no cleaning agent. If using a cleaner, it must be a non-emulsifying product such as QOR-110 (“Quick Oil Release”).

### **INSPECTION PROCEDURES**

- Inspect floor drain systems regularly – use only those that discharge to a sanitary sewer.
- Identify the need for cleaning of catch basins, oil/water separators.

### **MAINTENANCE PROCEDURES**

- Maintain a figure of on-site storm drain locations to avoid discharges to the storm drainage system.
- Take precautions against excess use of and spillage of detergents.
- Clean vehicles only where wash-water can be captured for proper disposal.



## BMP 7 - SPILL PREVENTION AND RESPONSE

### **DESCRIPTION**

It is important to have a plan in place in the event a spill should occur, so contaminants do not mix with stormwater runoff. A spill prevention and response plan can be effective at reducing the risk of contamination to surface and groundwater contamination—but only with proper personnel training, the availability of cleanup supplies, and when management ensures procedures are followed.

### **POLLUTION PREVENTION APPROACH**

- Create a well thought out and implemented spill prevention and response plan.
- Post a response checklist in any hazardous waste storage area with contact information (including emergency phone numbers), and spill containment procedures.
- Train personnel.
- Regularly update plan, checklists, and contact information.
- Regularly inspect spill potential areas.
- Facilities with aboveground storage tanks (ASTs) and underground storage tanks (USTs) greater than 1,320 gallons and 42,000 gallons must have a Spill Prevention, Control and Countermeasures (SPCC) Plans in place.

### **SPILL PREVENTION AND RESPONSE PLAN**

An effective Spill Prevention and Response Plan may include one or more of the following:

- Description of the facilities, the address, activities and materials involved.
- Identification of key spill response personnel and hospital contacts.
- Identification of the potential spill areas or operations prone to spills/leaks.
- Identification of which areas should be or are bermed to contain spills/leaks.
- Facility map identifying the key locations of areas, activities, materials, structural BMPs, etc.
- Material handling procedures and safety measures for each kind of waste.
- Spill response procedures including:

### **TARGETED FACILITIES AND OPERATIONS**

- All City-Owned Buildings
- Street and Public Rights-of-Way

### **TARGETED CONSTITUENTS**

- Nutrients
- Metals
- Oil & Grease
- Hydrocarbons
- Organics

### **NOTES / SPECIFIC PROCEDURES:**

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

## BMP 7 - SPILL PREVENTION AND RESPONSE

- Assessment of the site and potential impacts
  - Containment of the material
  - Notification of the proper personnel and evacuation procedures
  - Clean up of the site
  - Disposal of the waste material
  - Proper record keeping procedures
- Plan to protect all storm drains in the event of a spill.
  - Descriptions of spill response equipment, including safety and cleanup equipment.

### **SUGGESTED BEST MANAGEMENT PRACTICES**

#### **Spill/Leak Prevention**

- If possible, move material handling indoors, under cover, or away from storm drains or sensitive water bodies.
- Properly label all containers so that the contents are easily identifiable.
- Berm storage areas so that if a spill or leak occurs, the material is contained.
- Cover outside storage areas either with a permanent structure or with a seasonal one such as a tarp so that rain will not come into contact with the materials.
- Check containers (and any containment sumps) often for leaks and spills. Replace containers that are leaking, corroded, or otherwise deteriorating with containers in good condition. Collect all spilled liquids and properly dispose of them.
- Store, contain, and transfer liquid materials in such a manner that if the container is ruptured or the contents spilled, they will not discharge, flow or be washed into the storm drainage system, surface waters, or groundwater.
- Place drip pans or absorbent materials beneath all mounted taps and at all potential drip and spill locations during the filling and unloading of containers. Any collected liquids or soiled absorbent materials should be reused/recycled or properly disposed of.
- For City programs that involve material transport, only transport the minimum amount of material needed for the daily activities and transfer materials between containers at a municipal yard where leaks and spills are

## BMP 7 - SPILL PREVENTION AND RESPONSE

easier to control.

- If paved, sweep and clean storage areas monthly, do not use water to hose down the area unless all the water will be collected and disposed of properly (e.g., in an oil/water separator).
- Install a spill control device (such as a tee section) in any catch basins that collect runoff from any storage areas if the materials stored are oil, gas, or other materials that separate from and float on water. This will allow for easier cleanup if a spill occurs.
- If necessary, protect catch basins while conducting field activities so that if a spill occurs, the material will be contained.
- Keep ample supplies of spill cleanup materials such as Speedi Dry and absorbent boom pads onsite.

### **Spill Clean Up**

- Report any spills immediately to the identified key municipal spill response personnel.
- Report spills in accordance with applicable reporting laws. Spills that pose an immediate threat to human health or the environment must be reported immediately to the Fire Department at 911, the City's Board of Health at 978-970-4010, and the Public Works Department at 978-674-4111.
- Large spills including those over 10 gallons should be reported to the Fire Department at 911 and the Public Works Department at 978-674-4111.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour). An oil spill over 10 gallons that reaches a surface water, sewer, storm drain, ditch, or culvert leading thereto requires MassDEP notification at 1-888-304-1133.
- After the spill has been contained and cleaned up, a detailed report about the incident should be generated and kept on file. The incident may also be used in briefing staff about proper procedures.

### **INSPECTION PROCEDURES**

- Inspect secondary containment systems and oil/water

## BMP 7 - SPILL PREVENTION AND RESPONSE

separators periodically to identify any operational problems.

- Inspect containers for leaks, areas near storm receiver inlets and-outlets, and floor drains for indications of spills.

### **MAINTENANCE PROCEDURES**

- Pump out oil/water separators as needed.
- Protect drains with oil absorbent materials.
- Clean out receivers on regular schedule.
- Remove spilled salt from salt loading areas and salting procedures.



## BMP 8 – LAWN AND GROUNDS MAINTENANCE

### DESCRIPTION

Nutrient loads generated by suburban lawns as well as municipal properties can be significant, and recent research has shown that lawns produce more surface runoff than previously thought. Pesticide runoff can contribute pollutants that contaminate drinking water supplies and are toxic to both humans and aquatic organisms.

### POLLUTION PREVENTION APPROACH

It is important to reduce pesticides, herbicides, fertilizers, and lawn debris from entering surface and ground water supplies by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater drainage system.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

### SUGGESTED BEST MANAGEMENT PRACTICES

#### Landscaping Activities

- Do not apply any chemicals (insecticide, herbicide, or fertilizer) directly to surface waters, unless the application is approved and permitted by MassDEP
- Use mulch or other erosion control measures on exposed soils.
- Check irrigation schedules so pesticides will not be washed away and to minimize non-stormwater discharge.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the stormwater drainage system.
- Use hand or mechanical weeding where practical.
- Employ mowing techniques to maintain a healthy lawn and minimize chemical use—no more than 1” of lawn should be removed from each mowing (grasses kept at 2.5” to 3.0” high are more heat resistant than close-cropped grass).
- Keep mower blades sharp and leave clippings in place

### TARGETED FACILITIES AND

#### OPERATIONS

- All City-Owned Facilities with lawns and grounds
- Street and Public Rights-of-Way

#### TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Organics
- Low Dissolved Oxygen

#### REFERENCE

- [Northern Middlesex Stormwater Collaborative Stormwater Information for Municipalities](#)

#### NOTES / SPECIFIC PROCEDURES:

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

## BMP 8 – LAWN AND GROUNDS MAINTENANCE

after mowing.

- Water plants in the early morning.

### **Fertilizer and Pesticide Management**

- Utilize slow releasing fertilizers on permittee properties that currently use fertilizer.
- Follow manufacturers' recommendations and label directions.
- Do not apply insecticides within 100 feet of surface waters such as lakes, ponds, wetlands, and streams.
- Use fewer toxic pesticides that will do the job, whenever possible and use the minimum amount needed. Avoid use of copper-based pesticides if possible.
- Do not use pesticides/fertilizers if rain is expected.
- Do not mix or prepare pesticides/fertilizers for application near storm drains.
- Perform a soil analysis prior to applying fertilizers to determine the appropriate nutrients required for soil conditions.
- Calibrate fertilizer distributors to avoid excessive application.
- Apply pesticides/fertilizers only when wind speeds are low.
- Work fertilizers into the soil rather than dumping or broadcasting them onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Dispose of empty pesticide/fertilizer containers according to the instructions on the container label.
- Use up the pesticides. Rinse containers and use rinse water as product.
- Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local Fire Department and the Massachusetts Department of Agricultural Resources.
- Provide secondary containment for pesticides.

### **Debris Removal**

- Use yard waste as mulch and topsoil.
- Compost or mulch yard waste.

## BMP 8 – LAWN AND GROUNDS MAINTENANCE

- Sweep up yard debris instead of hosing down.
- Clean pavement and sidewalk if fertilizer/pesticide is spilled on these surfaces before applying irrigation water.
- Do not leave yard waste in the street or sweep it into storm drains or streams.
- Do not blow organic waste onto adjacent impervious surfaces.

### **INSPECTION PROCEDURES**

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring.
- Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect and remove accumulated debris from grounds.
- Routinely monitor lawns to identify problems during their early stages.
- Identify nutrient/water needs of plants.
- Inspect for problems by testing soils.

### **MAINTENANCE PROCEDURES**

- Sweep paved areas regularly to collect loose particles.
- Wipe up spills with rags and other absorbent material immediately.
- Do not hose down the area to a storm drain.
- Maintain sharp mower blades



## BMP9 - STREET AND PARKING LOT SWEEPING

### **DESCRIPTION**

Street and parking lot sweeping includes self-propelled equipment to remove sediment from paved surfaces that can enter storm drains or receiving waters. Sweeping is most effective for removing coarse particles, leaves, and trash. Regularly sweeping reduces catch basin cleaning.

### **POLLUTION PREVENTION APPROACH**

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

### **SUGGESTED BEST MANAGEMENT PRACTICES**

- Adhere to the City's cleaning schedule – all City streets are swept at least twice per year, with main City streets being swept one to two times per month.
- City parking lots should be checked regularly by Facility personnel and swept when needed.
- Any visible sediment should be swept up (including sand/salt mixtures and granular material).
- Control the number of points where vehicles leave the Facilities to allow sweeping to be focused on certain areas in parking lots.
- Sweep up the smallest particles feasible.
- Sweep in pattern to keep spilled material from being pushed into catch basins.
- Before sweeping, manually rake sand from any turf areas on surfaces to be swept.
- Use hand-held tools to assist with mechanical equipment.
- If possible, recycle Fall leaf sweepings by composting.
- The Highway Department should maintain a log or schedule of sweeping activities they conduct. Information should include mileage, number of sweepings removed, and heavily sedimented areas for street rights-of-way.
- Facilities should maintain a log or schedule for their facility parking lots. Information should include number of sweepings removed, heavily sedimented catch basins, and date of sweeping activities. By recording heavily

### **TARGETED FACILITIES AND OPERATIONS**

- All City-Owned Facility Parking Lots
- Street Rights-of-Way
- Highway Division Operations

### **TARGETED CONSTITUENTS**

- Sediment
- Nutrients
- Salt
- Trash
- Metals
- Oil & Grease
- Organics

### **REFERENCE**

- [DEP Guidance on Street Sweeping](#)
- [Lowell Street Sweeping Schedule](#)

### **NOTES / SPECIFIC PROCEDURES:**

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

## BMP9 - STREET AND PARKING LOT SWEEPING

sedimented areas, prioritizations can be made to sweep these areas or clean catch basins more frequently.

### **INSPECTION PROCEDURES**

- Regularly inspect streets and City-owned parking lots within the MS4 for debris.

### **MAINTENANCE PROCEDURES**

- Adjust broom frequently to maximize efficiency of sweeping operations.
- After sweeping is finished, properly dispose of sweeper wastes.
- Do not use kick brooms or sweeper attachments that tend to spread dirt.
- When unloading sweeper, make sure there is no dust or sediment release.
- Inspect sweepers to check that they are properly maintained and repaired.





BMP9 - STREET AND PARKING LOT SWEEPING

MAINTENANCE LOG BMP 9 - Street & Parking Lot Sweeping

Maintenance Records (copy information below for each control measure) **Example**

Equipment: **FRHT M2 Sweeper**

Regular Maintenance Activities: **Check sweeper brooms for wear/issues.**

Regular Maintenance Schedule: **Regularly after use.**

Date of Action: **May 2021**

Reason for Action:      Regular Maintenance  Discovery of Problem

If Problem,

- Description of Action Required: **No problems noted.**

- Date Fixed:

- Justification if Maintenance Schedule is Extended:

Notes:

Control Measure Maintenance Records (copy information below for each control measure)

Equipment:

Regular Maintenance Activities:

Regular Maintenance Schedule:

Date of Action:

Reason for Action:      Regular Maintenance  Discovery of Problem

If Problem,

- Description of Action Required:

- Date Fixed:

- Justification if Maintenance Schedule Extended:

Notes:

## BMP 10 - CATCH BASIN CLEANING

### **DESCRIPTION**

It is important to remove sediments from catch basins that can have a high concentration of pollutants including metals and hydrocarbons. These sediments can clog downstream drainage systems and transport pollutants to nearby waterbodies.

### **POLLUTION PREVENTION APPROACH**

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

### **SUGGESTED BEST MANAGEMENT PRACTICES**

- Prioritize inspection and maintenance for catch basins located near construction activities.
- Ensure that no catch basin at any time will be more than 50 percent full.
- Document catch basins with sumps more than 50 percent full during two consecutive inspections/cleanings.
- US EPA recommends cleaning basins when solids reach one-third the depth from the basin bottom to the invert of the lowest pipe into or out of the basin.
- Target cleaning for early Spring or late Fall.
- Clean manually or with equipment (i.e., bucket loaders).
- Properly dispose of catch basin material or store until contractor picks up cleanings (MassDEP and US EPA requires chemical analysis to determine if substance is hazardous waste).
- Repair damaged catch basins including outlet traps.
- Install hoods if catch basins do not have them.
- Inform employees that catch basins are part of the stormwater drainage system and not the sanitary sewer system.
- The DPS should maintain a log of cleaning activities. Information should include the amount of cleanings removed (volume or weight) and areas with heavily filled basins.
- Facilities should maintain a log of cleaning activities on their parking lots. Information should include amount of cleanings removed, heavily filled catch basins, and dates

### **TARGETED FACILITIES AND OPERATIONS**

- All City-Owned Facilities
- Street Rights-of-Way
- Disposal of Removed Solids

### **TARGETED CONSTITUENTS**

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics

### **REFERENCE**

- [MassDEP Management of Catch Basin Cleanings](#)

### **NOTES / SPECIFIC PROCEDURES:**

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

## BMP 10 - CATCH BASIN CLEANING

cleaned by the Highway Division.

### **INSPECTION PROCEDURES**

- Inspect catch basins, grates, and ditches at least once per year (best times are before the start and before the end of the rainy season).
- Inspections should be incorporated during routine cleaning, as part of reconstruction contracts, and through requests made by residents or other City departments.
- If illicit discharges are observed or suspected, notify the DPS&U at phone 413-499-9330.

### **MAINTENANCE PROCEDURES**

- Clean catch basins based on the cleaning schedule or as needed. Catch basins should be checked for sediment levels in sump. Those in areas that accumulate a significant amount of sediment should be cleaned more frequently.
- During catch basin repairs, any hoods missing should be replaced.





# BMP 10 - CATCH BASIN CLEANING

## CATCH BASIN INSPECTION SHEETS

### Background Data

City:	Street:	Catch Basin ID: CB-
Owner: <input type="checkbox"/> City <input type="checkbox"/> State <input type="checkbox"/> Private <input type="checkbox"/> Other: _____	Nearest House/Utility Pole #:	
Today's date:	Time (Military):	
Investigators:	Form completed by:	
A: Depth Rim to Lowest Outlet Invert (in):	B: Depth Rim to Top of Sediment (Before Cleaning) (in.):	
C: Depth Rim to Bottom of Sump after Cleaning (in.):	D: Depth of Sump = A - C (in):	Catch Basin Sump % Full = (C-B) / D:
Land Use in Drainage Area (Check all that apply):		
<input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Suburban Residential <input type="checkbox"/> Commercial	<input type="checkbox"/> Ongoing Construction Site <input type="checkbox"/> Open Space/Wooded <input type="checkbox"/> Institutional Other: _____ Known Industries: _____	
Notes:		

# BMP 10 - CATCH BASIN CLEANING

## Visual/Sensory Observations of Potential Illicit Discharge?

Are Any Visual/Sensory Observations Present?  Yes  No (If No, Skip Entire Section)

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Flow	<input type="checkbox"/>	Flow Source:	<input type="checkbox"/> 1 – Trickle	<input type="checkbox"/> 2 – Moderate	<input type="checkbox"/> 3 – Substantial
Odor	<input type="checkbox"/>	<input type="checkbox"/> Sewage <input type="checkbox"/> Rancid/sour <input type="checkbox"/> Petroleum/gas <input type="checkbox"/> Sulfide <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Faint	<input type="checkbox"/> 2 – Easily detected	<input type="checkbox"/> 3 – Noticeable from a distance
Color	<input type="checkbox"/>	<input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Gray <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Orange Red      Other:	<input type="checkbox"/> 1 – Faint color	<input type="checkbox"/> 2 – Moderately visible	<input type="checkbox"/> 3 – Clearly visible
Turbidity	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> See severity	1 – Slight cloudiness	2 – Cloudy	3 – Opaque
Floatables -Does Not Include Trash!!	<input type="checkbox"/>	Sewage (Toilet Paper, etc.)      Suds <input type="checkbox"/> Petroleum (oil sheen) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Other :	<input type="checkbox"/> 1 – Few/slight; origin not obvious <input type="checkbox"/>	<input type="checkbox"/> 2 – Some; indications of origin (e.g., possible <input type="checkbox"/> suds or oil sheen)	<input type="checkbox"/> 3 - Some; origin clear (e.g., obvious oil sheen, <input type="checkbox"/> suds, or floating sanitary materials)

Section 7: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

**DESCRIPTION**

Pet droppings are important contributors of pollution in surface waterbodies where there are high populations of dogs. Studies have shown that a typical dog dropping can have as many as 3 billion fecal coliform and can carry many diseases that could make water unsafe for contact.

Waterfowl waste not only raises bacteria concentrations to levels unsafe for water contact recreation, but it is also a source of nutrients that allow excessive growth of algae and rooted aquatic plants in receiving waters. Feeding of waterfowl by streams and ponds encourages waterfowl congregation in those areas.

**POLLUTION PREVENTION APPROACH**

Provide pet waste and waterfowl management awareness and education programs with the following elements:

- Encouraging residents to clean up after their pets and to properly dispose of such wastes that may be deposited in their yards, streets, and parks.
- Posting signs in local parks describing the problem and urging cleanup and proper disposal of pet wastes.
- Discourage feeding of waterfowl at local parks, particularly where adjacent to waterways. Produce educational material and/or post signage as appropriate.
- Provide pet waste information to dog owners during annual pet license renewal.

**SUGGESTED BEST MANAGEMENT PRACTICES**

- Put pet waste in the trash.
- Restrict dog access to areas of parks where swales, steep slopes and streams are.
- Provide vegetated buffers of prescribed widths between dog parks and waterways, swales, storm drain inlets, gullies, and steep slopes.
- Incorporate public outreach elements like signage and informational brochures into and around parks.

**TARGETED FACILITIES AND OPERATIONS**

- All City-Owned Parks, Playgrounds, and Reservations
- Sidewalk and Street Rights-of-Way
- Areas surrounding waterbodies with bacteria/pathogen impairments: Housatonic River, East, Southwest, and West Branch

**TARGETED CONSTITUENTS**

- Bacteria
- Nutrients
- Organics
- Low Dissolved Oxygen

**Reference**

- [Northern Middlesex Stormwater Collaborative Stormwater Information for Residents](#)

**NOTES / SPECIFIC PROCEDURES:**

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

**INSPECTION PROCEDURES**

- Routinely inspect common dog walking areas for pet waste.
- Evaluate pet waste/water fowl waste management and document targeted effort to address “problem” areas.

**MAINTENANCE PROCEDURES**

- Remove and properly dispose of pet waste.



## BMP 12 – WASTE MANAGEMENT

### DESCRIPTION

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff.

### POLLUTION PREVENTION APPROACH

The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, re-use, and recycling; and preventing run-on and runoff.

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

### SUGGESTED BEST MANAGEMENT PRACTICES

#### General

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Sweep and clean the storage area regularly. If it is paved, do not hose down the area to a storm drain.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses.

#### Controlling Litter

### TARGETED FACILITIES AND OPERATIONS

- All City-Owned Facilities

### TARGETED CONSTITUENTS

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

### NOTES / SPECIFIC PROCEDURES:

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

## BMP 12 – WASTE MANAGEMENT

- Post “No Littering” signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

### **Waste Collection**

- Keep waste collection areas clean before contractor picks up.
- Inspect solid waste containers for structural damage or leaks regularly.
- Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Place waste containers under cover if possible.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.

### **Good Housekeeping**

- Use the entire product before disposing of the container.
- Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g. sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.

## BMP 12 – WASTE MANAGEMENT

- Stencil storm drains on the facility's property with prohibitive message regarding waste disposal.

### **Chemical/Hazardous Wastes**

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers protected from vandalism, and in compliance with fire and hazardous waste codes.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.

### **Run-on/Runoff Prevention**

- Prevent stormwater run-on from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent the waste materials from directly contacting rain.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene, or Hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

### **INSPECTION PROCEDURES**

- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Check waste management areas for leaking containers or spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

### **MAINTENANCE PROCEDURES**

## BMP 12 – WASTE MANAGEMENT

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• Maintain equipment for material tracking program.</li></ul> |  |
|---|--|



<p><b><u>DESCRIPTION</u></b></p> <p>Typical building operations include cleaning operations such as outside pressure washing of buildup and repairs.</p> <p><b><u>POLLUTION PREVENTION APPROACH</u></b></p> <p>Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.</p> <p><b><u>SUGGESTED BEST MANAGEMENT PRACTICES</u></b></p> <p><b>Pressure Washing of Buildings, Rooftops, and Other Large Objects</b></p> <ul style="list-style-type: none"> <li>• In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a waste/water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.</li> <li>• If soaps or detergents are not used, and the surrounding area is paved, wash water runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.</li> <li>• If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement. Ensure that this practice does not kill grass.</li> </ul> <p><b>Building Repair, Remodeling, and Construction</b></p> <ul style="list-style-type: none"> <li>• Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.</li> <li>• Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.</li> <li>• Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.</li> <li>• Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection</li> </ul>	<p><b><u>TARGETED FACILITIES AND OPERATIONS</u></b></p> <ul style="list-style-type: none"> <li>• All City-Owned Facilities</li> </ul> <p><b><u>TARGETED CONSTITUENTS</u></b></p> <ul style="list-style-type: none"> <li>• Sediment</li> <li>• Nutrients</li> <li>• Trash</li> <li>• Metals</li> <li>• Oil &amp; Grease</li> <li>• Organics</li> <li>• Low Dissolved Oxygen</li> </ul> <p><b><u>NOTES / SPECIFIC PROCEDURES:</u></b> (List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)</p>
--	---

## BMP 13 – BUILDING OPERATIONS

of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal. Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and should direct the water through hay bales and filter fabric or use other sediment filters or traps.

- Store toxic material under cover with secondary containment during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

### **INSPECTION PROCEDURES**

- Sweep paved areas regularly to collect loose particles and wipe up spills with rags and other absorbent material immediately; do not hose down the area to a storm drain.



## BMP 14 – OIL/WATER SEPARATORS

### **DESCRIPTION**

Oil/Water separators/interceptors are important to prevent gasoline, oil, or sand from getting into the drainage systems. In the following places they are always required:

- Repair garages where motor vehicles are serviced and repaired, and where floor drainage is provided
- Commercial motor vehicle washing facilities
- Gasoline Stations with grease racks, grease pits, or wash racks
- Facilities which have oily and/or flammable waste because of manufacturing, storage, repair, or testing
- Public storage garages with floor drainage
- Any place where solid, oil, gasoline or other volatile liquids can enter the drainage system

### **POLLUTION PREVENTION APPROACH**

Implement applicable suggested Best Management Practices to reduce the influx of pollutants to the stormwater drainage system to the maximum extent practicable.

### **SUGGESTED BEST MANAGEMENT PRACTICES**

- Frequent sweeping of areas discharging to the separator, depending on use.
- Target cleaning for early Spring or late Fall.
- Use oil absorbent materials on any liquid spills, such as oil or hydraulic fluid leaks.
- The facility manager should maintain a log of cleaning activities.
- Information should include frequency of cleanings.
- It is important to remove sediments from garage floors that can have a high concentration of pollutants including metals and hydrocarbons. These sediments can clog downstream drainage systems and transport pollutants to nearby water bodies.

### **INSPECTION PROCEDURES**

- Oil/Water Separators/interceptors should be inspected twice per year (best times are before the start and before the end of the rainy season).

### **TARGETED FACILITIES AND**

#### **OPERATIONS**

- All City-Owned Facilities
- Street Rights-of-Way
- Disposal of Removed Solids

#### **TARGETED CONSTITUENTS**

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

#### **NOTES / SPECIFIC PROCEDURES:**

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

## BMP 14 – OIL/WATER SEPARATORS

### **MAINTENANCE PROCEDURES**

- Clean Oil/Water Separators when necessary.
- Drains and grates should be free of debris or sediments.
- Dripping pans should be used under vehicles or spigots.
- Spill absorbent material should be ready for use.
- Floors should be kept clean and spill materials should be cleaned up in a timely manner.



## BMP 15 – BIO-RETENTION

### **DESCRIPTION**

Bio-retention areas allow for runoff to be filtered through a soil medium that removes different pollutants before the runoff enters the stormwater drainage system. The Bio-retention facility needs to be maintained frequently for the first year and then annually after that.

Rain gardens (less complex bioretention areas) are located along North Street.

### **POLLUTION PREVENTION APPROACH**

The suggested Best Management Practices should be used to reduce the influx of pollutants into the storm water drainage system and increase the longevity of the bio-retention basin

### **SUGGESTED BEST MANAGEMENT PRACTICES**

- It is recommended that the area be cleaned once in the early spring and once in the late fall.
- The area should be cleaned with hand tools, rakes, shovels, and light construction equipment. Vehicles should not be driven on the bio- retention area.
- All damage should be repaired and mulch areas that are exposed should be fixed.
- Facilities and personal in-charge of the bio-retention area should keep inspectional logs and cleaning activity logs.

### **INSPECTION PROCEDURES**

- Bio-retention areas should be inspected after every rainfall over a half inch of rainfall for the first year.
- Inspection of the bio-retention area should be daily for the first month to ensure the area is taking properly.
- The bio-retention area should be inspected once a month during the growing season and once in the beginning of Spring and at the end of Fall.

### **MAINTENANCE PROCEDURES**

Bio-retention areas should be kept free of debris and weeds to ensure a properly working infiltration and stormwater management area. Routine maintenance

### **TARGETED FACILITIES AND OPERATIONS**

- All City-Owned property
- City-owned parking lots with
- Street Rights-of-Way

### **TARGETED CONSTITUENTS**

- Sediment
- Nutrients
- Trash
- Metals
- Oil & Grease
- Organics
- Low Dissolved Oxygen

### **REFERENCE**

- [Northern Middlesex Stormwater Collaborative Stormwater Information for Municipalities](#)

### **NOTES / SPECIFIC PROCEDURES:**

(List identified problem or priority areas, document changes in protocol, or unique conditions along with date(s) of implementation and personnel initials)

## BMP 15 – BIO-RETENTION

should be done year-round and does not require much effort if area is wellkept.

After planting:

- The area should be watered daily for two weeks unless significant rainfall has occurred
- Inspect the bio-retention area for any signs of erosion.
- Re-mulch any area where bare soil has become exposed or mulch layer has been significantly reduced.
- If necessary, use stones to stabilize drainage paths within the bio- retention area. If it is possible use a wetland grass mixture if the area will hold the seeds.

After first rainfall:

- The bio-retention area should be free of standing water within 72-hours of rainfall. No standing water should be visible within the bio-retention area. If the area has not drained, continue to monitor; soil remediation or an improved under drain system may be needed.
- Ensure that mulch has not moved and settled in clumps.
- If applicable, inspect all inlets and outlet structure to ensure that runoff has drained properly with the basin.

One month of planting:

- Inspect all plants to ensure that they are free of pest and diseases; do not use any toxic pesticide or other toxic methods to remove pest and diseases. The toxic substance will enter the ground and the storm sewer system.
- Make repairs to all areas in and around the bio-retention area that appear to be worn down.
- Add mulch to areas that are bare or for which insufficient mulch coverage is observed.
- Remove any weeds from the area, ensure that all root systems from the weeds have been destroyed. Do not use any toxic substances to remove weeds.

## BMP 15 – BIO-RETENTION

The following seasons:

- Every 6 months or in spring and fall, whichever comes first, add 1” of mulch.
- Once every 2 to 3 years, in the spring, apply a new 3” layer of mulch in the entire bio-retention garden.
- If plants are showing signs of pest, disease or are growing poorly, remove the plant(s) and replace. Inspect the plants surrounding the area to ensure that there is not a greater problem.
- During times of extended drought look for features of stress (wilting, spotted brown leaves, loss of leaves, poor plant health, etc.)
- Area should be watered, when needed, in the early morning when maximum absorption takes place.
- Prune excess growth annually or more often. Trimmed material may be recycled in with the mulch.
- Weed the area regularly; however the area should not be mowed.



<p><b>DESCRIPTION</b></p> <p>Some operation and maintenance activities of public utilities and accidents can result in the discharge of pollutants that can pose a threat to both human health and the quality of receiving waters if they enter the storm drainage system. Sewage incident response and investigation may involve a coordinated effort between staff from a number of different departments/agencies. Storm drainage systems need to be cleaned regularly. Routine cleaning reduces the amount of pollutants, trash, and debris both in the storm drainage system and in receiving waters.</p> <p><b>POLLUTION PREVENTION APPROACH</b></p> <p>Inspect potential non-stormwater discharge flow paths and clear/cleanup any debris or pollutants found (i.e., remove trash, leaves, sediment, and wipe up liquids, including oil spills).</p> <p><b>SUGGESTED BEST MANAGEMENT PRACTICES</b></p> <p><b>Stormwater Drainage Maintenance</b></p> <ul style="list-style-type: none"> <li>• Cleaning the storm drain by flushing is more successful for pipes smaller than 36 inches in diameter.</li> <li>• A water source is necessary for cleaning. The wastewater generated from storm line cleaning must be collected and treated once flushed through the system.</li> <li>• Depending on the condition of the generated wastewater, it may or may not be disposed to sanitary sewer systems.</li> <li>• The efficiency of storm system flushing decreases when the length of sewer line being cleaned exceeds 700 feet.</li> </ul> <p><b>Sanitary Sewer Maintenance</b></p> <ul style="list-style-type: none"> <li>• Clean sewer lines on a regular basis to remove grease, grit, and other debris that may lead to sewer backups.</li> <li>• Establish routine maintenance program. Cleaning should be conducted at an established minimum frequency and more frequently for problem areas such as restaurants that are identified.</li> <li>• Cleaning activities may require removal of tree roots and other identified obstructions.</li> <li>• During routine maintenance and inspection note the condition of sanitary sewer structures and identify areas that need repair or maintenance. Items to note may include the following:             <ul style="list-style-type: none"> <li>– Cracked/deteriorating pipes</li> <li>– Leaking joints/seals at manhole</li> <li>– Frequent line plugs</li> </ul> </li> </ul>	<p><b><u>TARGETED FACILITIES AND OPERATIONS</u></b></p> <ul style="list-style-type: none"> <li>• All City-Owned Facilities</li> <li>• Street Rights-of-Way</li> </ul> <p><b><u>TARGETED CONSTITUENTS</u></b></p> <ul style="list-style-type: none"> <li>• Sediment</li> <li>• Nutrients</li> <li>• Trash</li> <li>• Metals</li> <li>• Oil &amp; Grease</li> <li>• Organics</li> <li>• Low Dissolved Oxygen</li> </ul>
---	---

## BMP 16–STORMWATER, SANITARY MAINTENANCE & WATER LINE REPAIR

- Line generally flows at or near capacity
- Suspected infiltration or exfiltration

- Prioritize repairs based on the nature and severity of the problem. Immediate clearing of blockage or repair is required where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, sewer line blockages). These repairs may be temporary until scheduled or capital improvements can be completed.
- Review previous sewer maintenance records to help identify “hot spots” or areas with frequent maintenance problems and locations of potential system failure.

### Spills and Overflows

- Establish lead department/agency responsible for spill response and containment. Provide coordination within departments.
- Record required information at the spill site & contact Mass DEP.
- Perform field tests as necessary to determine the source of the spill.
- Develop notification procedures regarding spill reporting.
  - When a spill, leak, and/or overflow occurs and when disinfecting a sewage contaminated area, take every effort to ensure that the sewage, disinfectant and/or sewage treated with the disinfectant is not discharged to the storm drainage system or receiving waters. Methods may include:
- Blocking storm drain inlets and catchbasins
- Containing and diverting sewage and disinfectant away from open channels and other storm drain fixtures (using sandbags, inflatable dams, etc.)
- Removing material with vacuumequipment

### Septic Systems

- Document City’s septic systems on a map.

### Planned Water Line Maintenance

- Discharge generated wastewater to a sanitary system with approval.
- Discharge to the storm drainage rain system using applicable pollution control measures. (Only available to clean water discharges such as water main/ water storage tank/water hydrant flushing).
- Discharge to the storm drainage rain system using applicable pollution control measures. (Only available to clean water discharges such as water main/ water storage tank/water

hydrant flushing).

- If water is discharged to a storm drain, control measures must be put in place to control potential pollutants (i.e. sediment, chlorine, etc.) such as silt fences, gravel and wire mesh filter, or wooden weir and fabric.
- General Design considerations for inlet protection devices include the following:
  - The device should be constructed such that cleaning and disposal of trapped sediment is made easy, while minimizing interference with discharge activities.
- Devices should be constructed so that any standing water resulting from the discharge will not cause excessive inconvenience or flooding/damage to adjacent land or structures.
- The effectiveness of control devices must be monitored during the discharge period and any necessary repairs or modifications made.

### **Unplanned Water Line Maintenance**

- Stop the discharge as quickly as possible.
- Inspect flow path of the discharged water:
  - Identify erodible areas which may need to be repaired or protected during subsequent repairs or corrective actions.
  - Identify the potential for pollutants to be washed into the waterway.
- If repairs or corrective action will cause additional discharges of water, select the appropriate procedures for erosion control, chlorine residual, turbidity, and chemical additives. Prevent potential pollutants from entering the flow path.

### **Inspection Procedures**

- Inspect for root infiltration. Tree roots are a major cause of backups.
- Inspect for water inflow/infiltration. Rainwater entering the sewer pipe can contribute to sanitary sewer overflows.
- Inspect for solids. Typical solids that buildup in the pipe and cause backups are grease, dirt, bones, tampons, paper towels, diapers, broken dishware, garbage, concrete, and debris.
- Inspect for structural defects in pipes and manholes - Sags in the line, cracks, holes, protruding laterals, misaligned pipe, and offset joints are all possible causes of backups.

### **Maintenance Procedures**

## BMP 16–STORMWATER, SANITARY MAINTENANCE & WATER LINE REPAIR

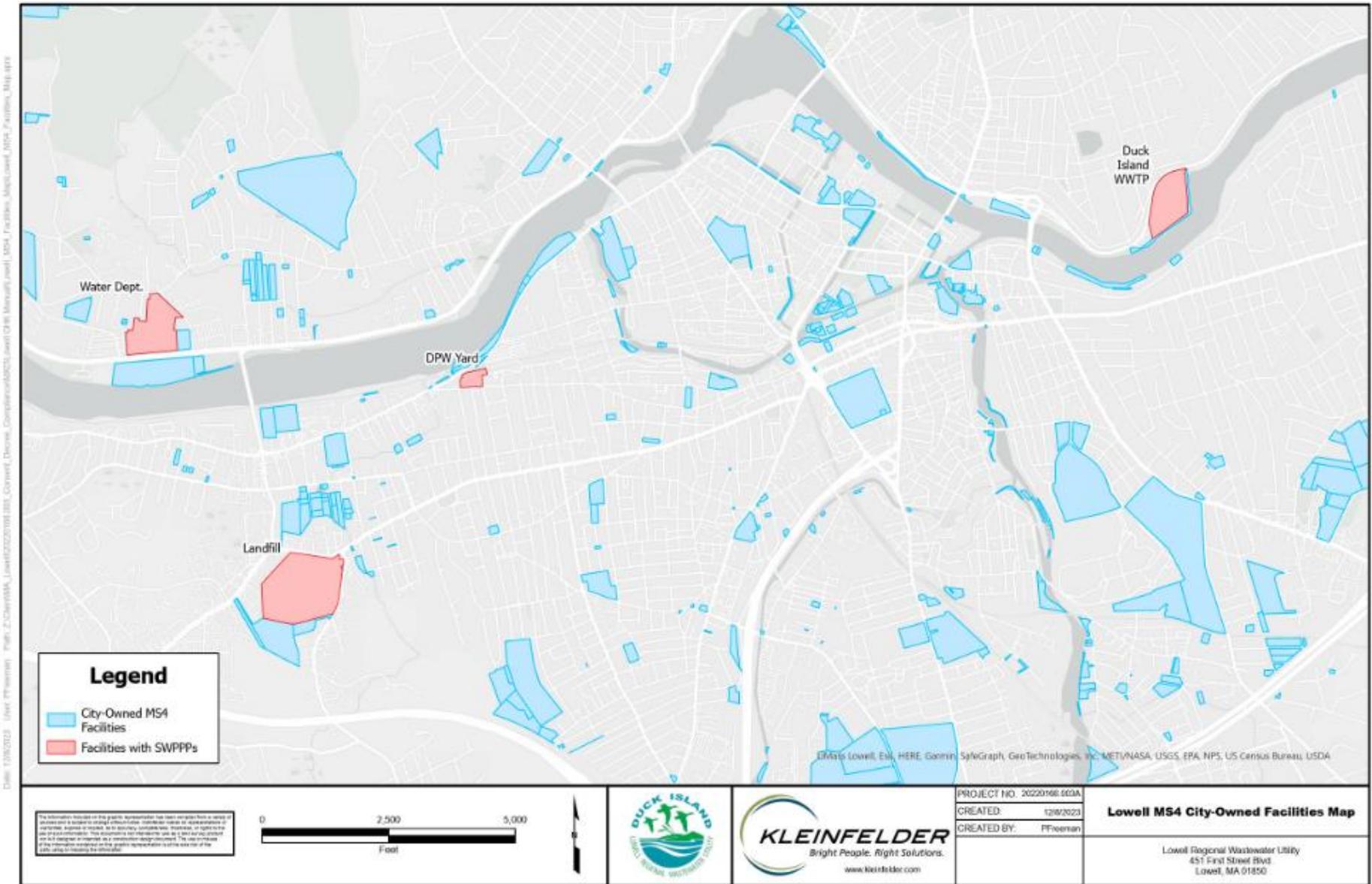
- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>• Repair structural defects in pipes and manholes.</li><li>• Refurbish portions of the utility lines periodically.</li><li>• All maintenance should be documented in City systems.</li></ul> |  |
|--|--|



APPENDIX A: SWPPP Facility Inventory

<b>SWPPP Facility Name</b>	<b>Address</b>
DPW Yard	1365 Middlesex Street, Lowell, MA 01852
Water Department	815 Pawtucket Boulevard, Lowell, MA 01854
Landfill	1020 Westford Street, Lowell, MA 01851
Duck Island Wastewater Treatment Plant	451 1 <sup>st</sup> Street Blvd, Lowell, MA 01850

APPENDIX B: MS4 CITY-OWNED FACILITIES MAP



### APPENDIX C: Facility Inspection Log

General Information			
Facility Name			
Date of Inspection		Start/End Time	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Weather Information			
Weather at time of this inspection?			
<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Sleet <input type="checkbox"/> Fog <input type="checkbox"/> Snow <input type="checkbox"/> High Winds			
<input type="checkbox"/> Other: _____                      Temperature: _____			
Have any previously unidentified discharges of pollutants occurred since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If yes, describe:			
Are there any discharges occurring at the time of inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If yes, describe:			

Control Measures:        Number the structural storm water control measures on your site map and list them below (add as many control measures as are implemented on-site). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required control measures at your facility. Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.

APPENDIX C: FACILITY INSPECTION LOG – STORMWATER POLLUTION

	Structural Control Measure	Control Measure is Operating Effectively?	If No, In Need of Maintenance, Repair, or Replacement?	Corrective Action Needed and Notes (identify needed maintenance and repairs, or any failed control measures that need replacement)
1		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Maintenance <input type="checkbox"/> Repair <input type="checkbox"/> Replacement	
2		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Maintenance <input type="checkbox"/> Repair <input type="checkbox"/> Replacement	
3		<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Maintenance <input type="checkbox"/> Repair <input type="checkbox"/> Replacement	
4		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Maintenance <input type="checkbox"/> Repair <input type="checkbox"/> Replacement	
5		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Maintenance <input type="checkbox"/> Repair <input type="checkbox"/> Replacement	
6		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Maintenance <input type="checkbox"/> Repair <input type="checkbox"/> Replacement	
7		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Maintenance <input type="checkbox"/> Repair <input type="checkbox"/> Replacement	

APPENDIX C: FACILITY INSPECTION LOG – STORMWATER POLLUTION

8		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Maintenance <input type="checkbox"/> Repair <input type="checkbox"/> Replacement	
---	--	--	---	--

APPENDIX C: FACILITY INSPECTION LOG – STORMWATER POLLUTION

	Structural Control Measure	Control Measure is Operating Effectively?	If No, In Need of Maintenance, Repair, or Replacement?	Corrective Action Needed and Notes (identify needed maintenance and repairs, or any failed control measures that need replacement)
9		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Maintenance <input type="checkbox"/> Repair <input type="checkbox"/> Replacement	
10		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Maintenance <input type="checkbox"/> Repair <input type="checkbox"/> Replacement	

APPENDIX C: FACILITY INSPECTION LOG – STORMWATER POLLUTION

Areas of Materials or Activities exposed to storm water

	Area/Activity	Inspected?	Controls Adequate (appropriate, effective, and operating)?	Corrective Action Needed and Notes
1	Material loading/unloading and storage areas	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	Equipment operations and maintenance areas	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	Fueling areas	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	Outdoor vehicle and equipment washing areas	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	Waste handling and disposal areas	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	Erodible areas/construction	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	

APPENDIX C: FACILITY INSPECTION LOG – STORMWATER POLLUTION

7	Non-storm water/ illicit connections	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
---	--------------------------------------	---	--	--

APPENDIX C: FACILITY INSPECTION LOG – STORMWATER POLLUTION

	Area/Activity	Inspected?	Controls Adequate (appropriate, effective, and operating)?	Corrective Action Needed and Notes
8	Salt storage piles or pile containing salt	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	Dust generation and vehicle tracking	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	(Other)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Non-Compliance: Describe any incidents of non-compliance observed and not described above:

Additional Control Measures: Describe any additional control measures needed to comply with the permit requirements:

Notes: Use this space for any additional notes or observations from the inspection: