STILLWATER ENVIRONMENTAL ENGINEERING, INC. • PO Box 426, ORONO, MAINE 04473

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) STORMWATER MANAGEMENT PLAN (SMP)

For

City of Bangor
73 Harlow Street, Bangor, ME 04401
(207) 992-4200

CITY OF BANGOR

Prepared By
Stillwater Environmental Engineering, Inc.

March 25, 2021

MS4 General Permit Effective July 1, 2022

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Contents

1 Introduction

1.1 Regulatory Overview

The City of Bangor (City) is subject to the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4s). The most recent permit was issued by the Maine Department of Environmental Protection (MDEP) on October 15, 2020, to be effective for 5 years from July 1, 2022 to June 30, 2027 (see **Attachment E**). The permit authorizes the direct discharge of stormwater from regulated MS4s to waters of the State, other than groundwater, pursuant to Water Pollution Control Law 38 M.R.S.A. § 413. The City of Bangor submitted a Notice of Intent (NOI) to comply with the terms and conditions of the MS4 General Permit on or before March 31, 2021 (see **Attachment F**).

The General Permit covers operations or activities associated with stormwater runoff within identified "urbanized areas" of the municipality's regulated MS4. An urbanized area is a classification of the U.S. Census Bureau that is based on population density and amount of concentrated development – factors that result in increased stormwater volume and pollutant load to receiving waterbodies in the area.

The U.S. Environmental Protection Agency (USEPA) and MDEP began regulating communities for their stormwater discharges using the Urbanized Area criteria in 2003. The City of Bangor became regulated in 2003 based on the 2000 census. **Attachment A** shows the urbanized area regulated by the 2022 MS4 General Permit for the City. This map was developed from the inclusive sum of the U.S. Census Bureau census conducted in 2000 and 2010. The 2022 MS4 General Permit does not include any modifications to urbanized area based on data from the 2020 U.S. Census.

The City of Bangor encompasses a total land area of approximately 34.26 square miles, with approximately 54% of that total area within the City's urbanized area. According to the 2010 U.S. Census, the population of the City is estimated to be 33,039, with 31,019 residents within the regulated urbanized area.

Each of the four MS4 General Permits (effective 2003, 2008, 2013, and 2022) have required that the regulated MS4s develop, and implement a Stormwater Management Plan (SMP) to coincide with the effective dates of the General Permit. The SMP is designed to reduce or eliminate polluted stormwater runoff to the maximum extent practicable (MEP) from its regulated MS4. The elements of the SMP are described in **Section 1.3**.

1.2 Cooperation Between Regulated Communities

There are 30 municipalities, two transportation agencies, and eight state/federal agencies in the State of Maine subject to MS4 General Permit regulation. Historically, there is a strong regional and/or state-wide collaborative effort among regulated entities to develop and carry out required permit activities. Most regulated MS4s (municipal, transportation, and state/federal) in the State are part of an established regional stormwater working group consisting of MS4 communities and supporting local organizations. These working groups include:

- Bangor Area Stormwater Working Group (BASWG);
- Androscoggin Valley (Lewiston-Auburn) Stormwater Working Group (AVSWG);
- Interlocal (Greater Portland) Stormwater Working Group (ISWG); and
- Southern Maine (York County) Stormwater Working Group (SMSWG).

The City of Bangor is a member of BASWG, a coalition of seven MS4 municipalities in the greater Bangor area (Bangor, Brewer, Hampden, Milford, Old Town, Orono, and Veazie) as well as the University of Maine,

Eastern Maine Community College, University of Maine at Augusta - Bangor Campus, the Maine Air National Guard, and the Dorothea Dix Psychiatric Facility, which are also regulated as MS4s under a separate permit.

BASWG participants, including the City of Bangor, have contributed to a regional BASWG SMP that addresses all collaborative practices implemented in an effort to comply with the 2022 MS4 General Permit. The City will continue to participate in and support implementation of regional practices outlined in the BASWG SMP (submitted to MDEP under separate cover). In addition, the City hires a third party-consultant to implement some requirements and implements other requirements using municipal staff. This plan describes which elements will be completed individually, or regionally.

1.3 Stormwater Management Plan

As mentioned in the Regulatory Overview, operators of a regulated small MS4 are required to design a stormwater management plan (SMP) that will effectively:

- Reduce the discharge of pollutants to the "maximum extent practicable" (MEP);
- Protect water quality; and
- Satisfy the appropriate water quality requirements of the USEPA's Clean Water Act.

The SMP is a tool describing how a regulated community plans to manage stormwater in a way that will limit pollutant loads and protect the quality of receiving waters. The plan is *not enforceable*, yet is *adaptive*, allowing the permittee to adjust approaches and practices throughout the permit cycle if needed based on regular evaluation of their effectiveness, changing conditions, specific local concerns, and/or other factors. Some SMP modifications require MDEP review and approval and public notice.

Specifications of the MS4 General Permit are primarily based on qualitative *minimum control measures* (MCMs) of stormwater management, less so on quantitative requirements (e.g. numeric water quality criteria). This SMP describes how the City will implement Best Management Practices (BMPs) to meet the six MCMs that are defined in Part IV(C) of the 2022 MS4 General Permit:

I - Public Education and Outreach

II - Public Involvement and Participation

III - Illicit Discharge Detection and Elimination Program

IV - Construction Site Stormwater Runoff Control

V - Post-Construction Stormwater Management in New Development and Redevelopment

VI - Pollution Prevention/Good Housekeeping for Municipal Operations

The 2022 MS4 General Permit requires that for each MCM, the City must:

a) Define appropriate BMPs;

b) Designate a person(s) responsible for implementing each BMP;

c) Define a date or timeline with milestones for implementation of each BMP; and

d) Define measurable goals for each BMP.

This SMP is developed in accordance with the terms and conditions of the MS4 General Permit reissued by the MDEP on October 15, 2020. Many of the BMPs in this plan continue or expand upon BMPs developed under prior MS4 General Permits. Specific requirements for addressing MCMs have changed though the six MCMs have remained the same for all permit cycles.

In addition to addressing the six MCMs, the City must address impaired waters requirements.

Section 1.4 and **Section 1.5** describe the City's water quality status, and the watershed(s) that are considered to be priorities for the City when considering stormwater management practices to prevent or alleviate impairment of waters. **Section 1.6**, **Section 1.7**, and **Section 1.8** describe how permit coverage is obtained, how the SMP is modified (when needed), when public notice is required, and annual reporting requirements.

The MDEP will review this SMP and determine if the City is controlling pollutants to the MEP. MEP is the USEPA's statutory standard for pollutant reduction requirements of permitted MS4s, and the term is flexible in consideration that pollutant control strategies will vary for each small MS4 based on unique local conditions and factors such as cost, existing technology, and logistics of BMPs. The City is allowed to consider these concepts as they select BMPs to meet permit requirements but the MDEP decides if the City is meeting the MEP standard. *Practices that were considered MEP under the MS4 2013 permit may no longer meet that standard and must be improved or expanded based on changed conditions.*

1.4 Discharges to Impaired Waters

Discharges to waterbodies with approved Total Maximum Daily Load (TMDL) or discharges causing or contributing to impairment have additional requirements in the 2022 MS4 General Permit:

1. If an MS4 has a point source discharge to a water with a TMDL approved before 10/15/2020, the discharge must be consistent with any TMDL requirements established by the MDEP.
    - If a TMDL is approved or modified by the EPA after 10/15/2020, the MDEP will notify the permittee if any changes are needed to the SMP, and may take other actions regarding the approved TMDL as identified in the 2022 MS4 General Permit.
2. If an MS4 has a discharge to an Urban Impaired Stream, it must develop and implement three (3) BMPs to address the water's impairment, unless the MDEP has determined the MS4 discharge is not causing or contributing to the impairment.

1.4.1 City of Bangor Water Quality Status

The following named waterbodies receive discharges from the City's MS4:

- Arctic Brook (impaired);
- Birch Stream (impaired);
- Capehart Brook (impaired);
- Cemetery Brook;
- Kenduskeag Stream (impaired);
- Meadow Brook (impaired);
- Penjajawoc Stream (impaired);
- Penobscot River (impaired);

- Shaw Brook (impaired);
- Sucker Brook (impaired); and
- Woodlawn Brook.

Six of these are designated as urban impaired streams and are with the UA: Arctic Brook, Birch Stream, Capehart Brook, Penjajawoc Stream, Shaw Brook, and Sucker Brook. Below is a summary of each urban impaired stream in the City's urbanized area receiving point source discharges from the City's MS4, including a description of the associated TMDL and impairment.

1. **Arctic Brook** watershed covers 768 acres consisting of a mix of forest, medium and high-density residential development and commercially developed areas. The stream begins in a forested wetland above Grandview Avenue. The stream covers a distance of 1.4 miles, and the impaired segment is 0.86 miles. The water quality of Arctic Brook has been assessed by the MDEP, and determined not to be meeting state water quality standards for aquatic life use. The stream was consequently listed on the State's 303(d) list of impaired waters in 2002. Arctic Brook has an impervious cover TMDL. The watershed currently has approximately 23% impervious cover. The TMDL target to restore stream quality is 8% impervious cover.

2. **Birch Stream** watershed covers 1,870 acres consisting of 244 commercial, industrial, governmental, and residential properties. The stream begins in an area occupied by the Bangor International Airport and the Air National Guard. The stream has a natural channel of 0.5 miles, that is all impaired. The water quality of Arctic Brook has been assessed by the MDEP, and determined not to be meeting state water quality standards for aquatic life use. The stream was consequently listed on the State's 303(d) list of impaired waters in 2002. Arctic Brook has an impervious cover TMDL. The watershed currently has approximately 23% impervious cover. The TMDL target to restore stream quality is 9% impervious cover.

3. **Capehart Brook** watershed covers 704 acres consisting of residential housing, forests, and some commercial properties. The impaired segment of the stream begins in the northeast corner of the watershed just below Finson Road. The impaired segment distance is 0.46 miles. The water quality of Capehart Brook has been assessed by the MDEP, and determined not to be meeting state water quality standards for aquatic life use. The stream was consequently listed on the State's 303(d) list of impaired waters in 2010. Capehart Brook has an impervious cover TMDL. The watershed currently has approximately 15% impervious cover. The TMDL target to restore stream quality is 8% impervious cover.

4. **Penjajawoc Stream (including Meadow Brook tributary)** watershed covers 5,600 acres consisting of commercial development, forests, residential areas, and a cemetery. The stream begins in a 300 acre marsh known as Penjajawoc Marsh. The Penjajawoc stream covers a distance of 5.2 miles and the Meadow Brook Tributary is 1.5 miles, the entire length of both is impaired. The water quality of Penjajawoc Stream has been assessed by the MDEP, and determined not to be meeting state water quality standards for aquatic life use, habitat, or dissolved oxygen. The stream was consequently listed on the State's 303(d) list of impaired waters in 2006. Penjajawoc has an impervious cover TMDL. The watershed was broken up into four portions for the TMDL assessment, Upper Watershed, Middle Watershed, Meadow Brook Watershed, and Mt. Hope Watershed. The four subwatersheds have approximately 3%, 33%, 19%, and 7% impervious cover, respectively. The TMDL target to restore stream quality is 10% impervious cover.

5. **Shaw Brook** watershed covers 3,386 acres in Bangor, Hampden, and Hermon. The stream begins in a forested area west of the Bangor International Airport runway. The impaired segment distance is 3.91 miles. The water quality of Shaw Brook has been assessed by the MDEP, and determined not to be meeting state water quality standards for aquatic life use. The stream was consequently listed on

the State's 303(d) list of impaired waters in 2010. Shaw Brook has an impervious cover TMDL. The watershed currently has approximately 15% impervious cover. The TMDL target to restore stream quality is 8% impervious cover.

6. **Sucker Brook** watershed covers 1,766 acres consisting of residential housing, forests, and some commercial properties. The stream begins near the southeastern end of the runway at Bangor International Airport on the southern side of Odlin Rd. The impaired segment distance is 2.5 miles. The water quality of Sucker Brook has been assessed by the MDEP, and determined not to be meeting state water quality standards for aquatic life use. The stream was consequently listed on the State's 303(d) list of impaired waters in 2010. Sucker Brook has an impervious cover TMDL. The watershed currently has approximately 25% impervious cover. The TMDL target to restore stream quality is 8% impervious cover.

The Penobscot River and the Kenduskeag Stream are listed on the statewide bacteria TMDL. As indicated through correspondence with MDEP staff, the City's IDDE program is sufficient to address these TMDLs.

1.5 Priority Watersheds

Previous MS4 General Permits required regulated MS4s to identify a Priority Watershed, and apply BMPs to that watershed. The 2022 MS4 General Permit does not contain any specific requirements related to Priority Watersheds. However, it does require an MS4 to have a procedure in place to prioritize watersheds when addressing illicit discharges. The City of Bangor uses this prioritization to identify where illicit discharge inspections are conducted first. The City may also use the prioritization for illicit discharge investigations in the event there were insufficient resources to address all potential illicit discharges simultaneously. The IDDE Plan (**Attachment B**) describes in more detail how the prioritization is applied.

1.6 Obtaining Coverage to Discharge

As required, a Notice of Intent (NOI) to comply with the 2022 MS4 General Permit was submitted to the MDEP with this SMP. A copy of the City's NOI is provided in **Attachment F**.

Following review of the SMP and NOI, the MDEP will issue a permittee specific DEP Order, establishing terms and conditions that are enforceable in addition to the language in the 2022 MS4 General Permit, which is also enforceable.

A 30-day Public Notice is required for both the NOI and the permittee specific DEP Order.

Once the MDEP issues authorization to discharge, the permittee has 60 days to update the SMP to reflect any new or changed requirements based on the DEP Order and any public comments. The new permit conditions will take effect on July 1st, 2022.

1.7 SMP Modifications

The SMP must be amended during the permit term (2022 - 2027) if the MDEP or the regulated MS4s determine that:

a) The actions required by the BMPs fail to control pollutants to meet the terms and conditions of the MS4 General Permit and the permittee specific DEP Order;

b) The BMPs do not prevent the potential for a significant contribution of pollutants to Waters of the State other than groundwater; or

c) New information results in a shift in the SMP's priorities.

Even though this SMP is not an enforceable document, if any modifications are made, the SMP will be made available for 30-day public comment by posting the changes on the City's website.

If the changes being made are not explicitly required by the 2022 MS4 General Permit or the permittee specific DEP Order, the opportunity for public comment will be made on the City's website annually and the MDEP will be notified of the changes in the annual report following the permit year the changes were made.

If the changes being made are explicitly required by the 2022 MS4 General Permit or the permittee specific DEP order, the applicable processes will be followed:

- *Modifications initiated by the City*: the City will notify the MDEP prior to changing any elements by filing a permit application with the MDEP that includes a justification to formally modify the requirement; or
- *Modifications initiated by the MDEP*: MDEP will notify the City, and the City must respond within 30 days with a written explanation of intended SMP modifications. The City must then modify the SMP within 90 calendar days of the City's written response, or within 120 calendar days of the MDEP notice (whichever is less). Any such modification must be submitted to the MDEP for final review.

1.8 Annual Compliance Report and Record Keeping

By September 15th of each year, the City will electronically submit an Annual Compliance Report for the MDEP's review using the standardized form provided by the MDEP. The Annual Compliance Report must be sent to:

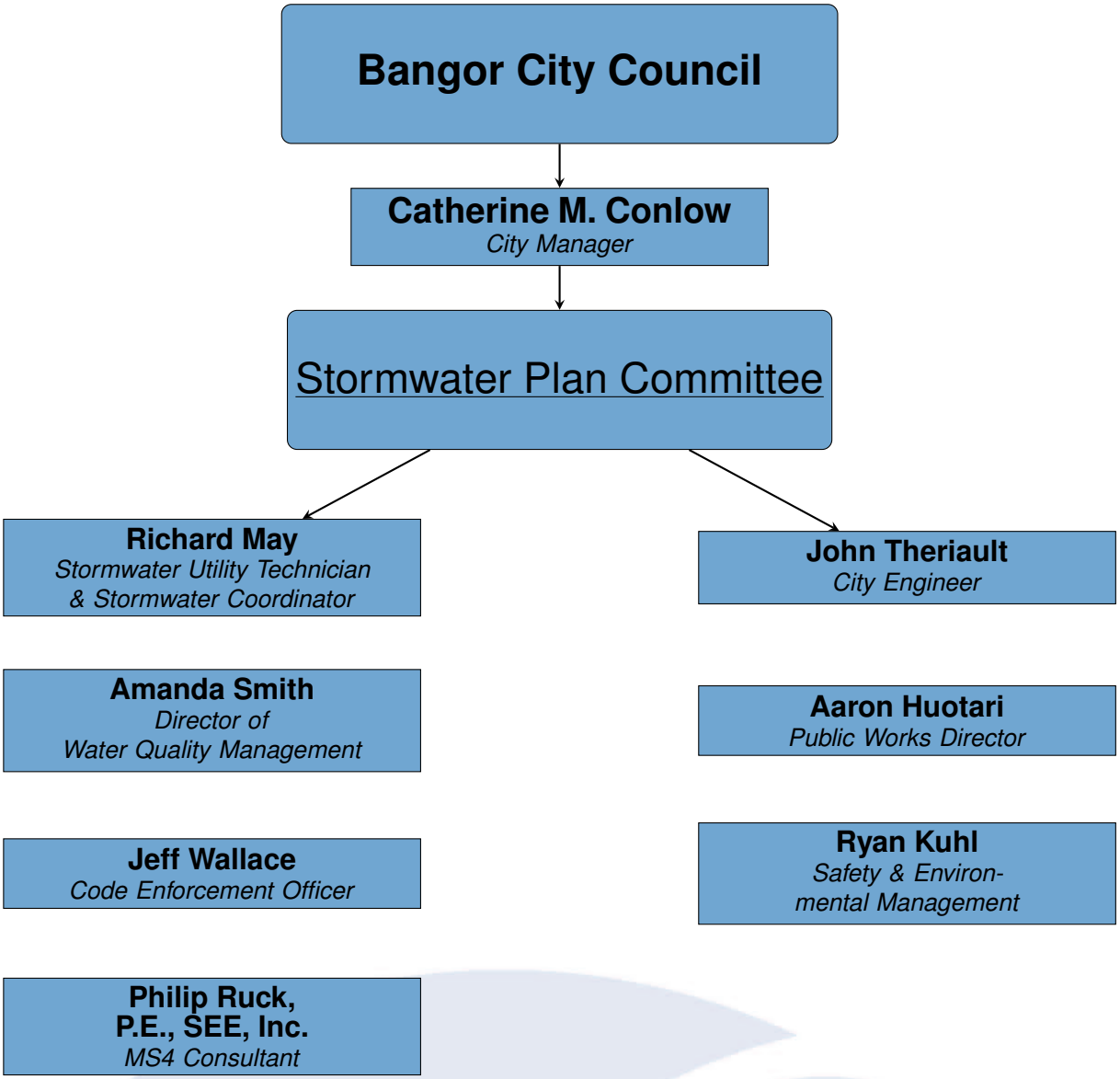
Rhonda Poirier
Municipal/Industrial Stormwater Coordinator
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017
rhonda.poirier@maine.gov

The MDEP will review the annual report and provide comments to the City. Changes to the report based on the MDEP's review comment(s) must be submitted to the Department within 60 days of the receipt of the comment(s).

As a regulated MS4, the City must keep records required by the 2022 MS4 General Permit and permit modification for at least three (3) years following its expiration or longer if requested by the MDEP Commissioner. The City must make records (including this SMP) available to the public at reasonable times during regular business hours.

2 SMP Organization

2.1 Plan Management Hierarchy



2.2 Additional Environmental Plans

The City implements the following existing environmental plans:

- Operations and Maintenance (O&M) Plan for Municipal Operations (available upon request);
- Illicit Discharge Detection and Elimination (IDDE) Plan (**Attachment B**);
- Level of Service (LOS) Plan for Snow and Ice Removal (available upon request);
- Construction Site Inspection Plan (available upon request); and
- Stormwater Pollution Prevention Plan (SWPPP) for the public works facility (available upon request).

3 Minimum Control Measures

3.1 MCM I - Education/Outreach Program

MS4 permittees must fully comply with MCM I by developing an Education/Outreach Program that will educate the public and smaller focus groups about polluted runoff and how to reduce pollution. The goal is to *change the behavior* of target audiences that will help to minimize stormwater impacts.

The City selected Best Management Practices (BMP's) for the Education/Outreach MCM of this SMP. The following BMPs are to be implemented through participation in BASWG and/or through the City's own education and outreach efforts. The outreach to raise awareness campaign targeted at the general public and the outreach to change behavior change campaign to two audiences will be conducted through participation in BASWG. Please see the BASWG SMP under separate cover for specifics about these campaigns.

3.1.1 BMP1A - Municipal Outreach to Raise Awareness

The 2022 General Permit requires each MS4 permittee to implement an outreach campaign to increase stormwater pollution awareness and deliver information to at least one of the following audiences: municipal, commercial, development/construction, or institutions. The outreach campaign must be delivered using at least three (3) outreach tools per year.

Description:
For the previous MS4 General Permit, the City developed a Municipal Permit Awareness Plan to educate municipal officials about the specifics of the City's SMP and also to focus on the impacts of stormwater runoff pollution. The existing plan was used to develop the Municipal Outreach program detailed below.

Measurable Goals:
During each permit year, the City will improve municipal staff and official's, awareness and knowledge of stormwater management and pollution prevention practices with a minimum of a 10% increase in awareness (determined through municipal surveys) by the end of PY5. The City chose a 10% increase, due to the high baseline level of staff awareness from the previous permit cycle. To improve municipal official's awareness, the City will use a minimum of three of the implementation tools below.

Target Audience: Municipal staff and officials.

Overarching Message: "The City has a stormwater discharge permit that requires municipal employees and officials to minimize stormwater pollutants entering into our local streams, to keep them clean and healthy for all City residents." This message will be presented with variations based on target audience interests and outreach tools used.

Implementation Tools:
To raise awareness of municipal staff and officials, the City will implement or support implementation of at least three (3) of the following outreach tools each year. If an implementation tool is found to be ineffective, based on process indicators (e.g. attendance), it will be modified accordingly.

1. Quarterly stormwater team meetings;
2. Annual email to municipal staff/officials summarizing the City's involvement in BASWG's annual public event;
3. Stormwater 101 handout for at least one of the following sub-audiences:

- City Council;
- City Planning Board;
- Public Works Department;
- Parks and Recreation Department;
- Department of Safety & Environmental Management;
- Code Enforcement Officers;
- Wastewater Department; or
- City Engineering Department.

4. Stormwater 101 training for at least one of the following sub-audiences:
    - City Council;
    - City Planning Board;
    - Public Works Department;
    - Parks and Recreation Department;
    - Department of Safety & Environmental Management;
    - Code Enforcement Officers;
    - Wastewater Department; or
    - City Engineering Department.

Responsible Party: Municipal Stormwater Manager

3.1.2 BMP1B - Evaluate Campaign Effectiveness

The 2022 General Permit requires each MS4 permittee to identify methods it will use to evaluate the effectiveness of each awareness and behavior change campaign. A relevant baseline evaluation (e.g. from previous permit cycle) must be conducted prior to each campaign, followed by an evaluation in year five of this permit to assess the overall effectiveness of the outreach program. Any message or delivery mechanism found ineffective or of unsatisfactory efficacy, must be modified accordingly.

Description:
The City will collect Education/Outreach program data to show evidence that progress toward the defined awareness and behavior goals of the program is achieved. The City will evaluate BMP1A, all other outreach and behavior change campaigns conducted through BASWG will be evaluated by BASWG. See the BASWG SMP under separate cover for more information.

Measurable Goals:

1. The baseline of the municipal awareness campaign will be evaluated in PY1 through a survey provided to municipal staff and officials to gauge their current understanding of MS4 Program related topics; and
2. Each annual municipal training program will include a written evaluation prior to and immediately following the training session. These evaluations will include applicable questions to gauge the effectiveness of each training session.

Implementation Tools:
At the beginning of and throughout the 2022 MS4 permit cycle, the City will collect E & O program data and periodically assess the effectiveness of the awareness campaign (BMP1A). The following tools will be implemented for evaluation:

1. In PY1, conduct a baseline evaluation of outreach effectiveness from the previous MS4 permit cycle;
2. Gather data and feedback from training participants via pre and post training surveys; and
3. In PY5, the City will evaluate the effectiveness of the municipal outreach campaign by summarizing the findings referenced above.

Responsible Party: Municipal Stormwater Manager

3.2 MCM II - Public Involvement and Participation

MS4 permittees must fully comply with MCM II by involving the public in the planning and implementation process of improving water quality and reducing storm water quantity via their storm water program. BMPs for this MCM must support active involvement of the public and stakeholders.

The City will fulfill the requirements for Public Involvement and Participation through relevant BASWG practices and by implementing additional BMPs.

3.2.1 BMP2A - Public Notice of Stakeholder Involvement

The MS4 permittee must comply with applicable state and local public notice requirements using effective mechanisms for reaching the public and comply with the Maine Freedom of Access Act when stakeholders are involved with implementation of the permit. The permittee must document the stakeholder meetings and attendance in the annual report as a way of measuring this goal.

Description:
The City will follow state and local Public Notice requirements when involving stakeholders, including BASWG and the City Council, in the implementation of the 2022 MS4 General Permit.

Measurable Goal:
There will be public notification and public access to documentation of all City meetings with MS4 permit stakeholders throughout the permit cycle.

Implementation Tools:
The City will comply with public notice and access requirements by:

1. Providing public notice of BASWG meetings, and posting BASWG agendas and minutes through a link to the BASWG website via the City website;
2. Posting the SMP on the City website; and
3. Providing public notice of City Council meetings, and posting Council meeting agendas and minutes on the City website, where MS4 related issues are discussed.

Responsible Party: Municipal Stormwater Manager

3.2.2 BMP2B - Public Events

The permittee or regional storm water group of which the permittee is a member must annually host/conduct or participate in a public event that includes a pollution prevention and/or water quality theme.

Description:
As a member of the BASWG, the City participates in public events. Please see the BASWG SMP, under separate cover, for more detailed information concerning these events.

Measurable Goal:
Each permit year the City will participate in at least one public event coordinated by the BASWG with a pollution prevention and/or water quality theme.

Implementation Tools:
To meet the goals and the MS4 permit requirements for public events, the City will participate in BASWG events each permit year. Please see the BASWG SMP, under separate cover, for more detailed information concerning these events.

Responsible Party: Municipal Stormwater Manager

3.3 MCM III - Illicit Discharge Detection and Elimination

Each MS4 permittee must implement and enforce a program to detect and eliminate illicit discharges and unauthorized non-stormwater discharges. The program must address the following four components: 1) Procedures for prioritizing watersheds, 2) Procedures for tracing the source of an illicit discharge, 3) Procedures for removing the source of the discharges, and 4) Procedures for program evaluation and assessment.

To meet MS4 General Permit requirements for this MCM, the City will continue to implement its Illicit Discharge Detection and Elimination (IDDE) program, which includes:

- A Watershed-based map of the City's stormwater management system;
- A written IDDE Plan, which includes;
  - Inspections of outfalls owned/operated by the City (and monitoring of those outfalls that flow during dry weather);
  - Investigations of potential illicit discharges;
  - Enforcement of the Non-Stormwater Discharge Ordinance; and
  - A Quality Assurance Project Plan (QAPP).
- Development of a prioritized list of outfalls which have the potential to cause illicit discharges during wet weather.

The following BMPs will be implemented to meet this MCM.

3.3.1 BMP3A - Non-stormwater Discharge Ordinance

The permittee must continue to implement a non-stormwater discharge ordinance that prohibits non-stormwater discharges and provides for the implementation of appropriate enforcement procedures and actions.

Description:
The City previously approved its Non-Stormwater Discharge Ordinance, which is included as Chapter 197 of the City's Code of Ordinances. The ordinance has been implemented since approval in 2005, and is enforced by the City Engineer.

Measurable Goals:

1. The City will implement and enforce its non-stormwater discharge ordinance throughout the 2022 MS4 permit cycle;
2. The City will continue to post its stormwater ordinance information and incidence hotline phone number on the City website; and
3. The City will report the number of incidents and provide a narrative in the annual report.

Implementation:
The City will continue to implement and enforce its non-stormwater discharge ordinance including potential sanitary sewer overflows (SSOs) within the City's regulated area. The City will provide information about the stormwater discharge ordinance on its municipal stormwater website page. The website will display a hotline phone number where anonymous reports about possible violations can be reported. The City will investigate all reports of potential violations of the non-stormwater discharge ordinance. Reports may be

received through phone calls, emails, or other mechanisms. Each incident report will be recorded in the incident report database and investigated in accordance with the City's IDDE plan.

Responsible Parties:

- Engineering; and
- WWTP (for SSOs)

3.3.2 BMP3B - IDDE Plan

The IDDE program must include a written IDDE Plan to address any discharge that is not uncontaminated groundwater, water from a natural resource, or an allowable non-stormwater discharge. The plan must address dumping that results in illicit discharges to the MS4. The IDDE plan must set forth all written procedures developed in accordance with the requirements listed in the General Permit.

Description:
The City developed an IDDE Plan as part of the 2013 MS4 General Permit, and has updated the IDDE Plan (see **Attachment B**) to meet requirements of the 2022 MS4 General Permit.

Measurable Goal:
As part of its IDDE program, the City will review its IDDE Plan each permit year and revise the plan as necessary.

Implementation:
The City will continue to refine their IDDE program.

Responsible Party: Engineering

3.3.3 BMP3C - Watershed Based Storm Sewer System Infrastructure Map

Permittees must maintain a map(s) of their municipally-owned or operated storm sewer system. The map(s) must show the location of all stormwater catch basins, connecting surface and subsurface infrastructure, depict the direction of in-flow and out-flow pipes, and the locations of all discharges from all stormwater outfalls operated by the regulated small MS4 to receiving waters or to an interconnected MS4 as well as the name of the receiving water for each outfall. Each catch basin must be uniquely identified to facilitate control of potential illicit discharges and proper operation and maintenance of these structures. Permittees must continue to keep their map(s) current and ensure that maps are reviewed for any updates at least annually. Permittees may choose to utilize paper or electronic maps for their storm sewer system.

Description:
The City developed and refined a watershed based storm sewer system infrastructure map during previous MS4 permit cycles. The City maintains a comprehensive municipal GIS database with over 25 layers of data, and frequently adds to and edits the database to keep information as accurate as possible.

Measurable Goals:
The City will review its storm sewer infrastructure maps and revise, as necessary. The review will encompass all existing storm sewer system infrastructure, including but not limited to:

- The location of all stormwater catch basins;
- Connecting surface and subsurface infrastructure depicting the direction of in-flow and out-flow pipes; and
- The locations and receiving waters for all municipal stormwater outfalls within the regulated area.

Implementation:
The City will continue to refine their City infrastructure mapping system, as necessary, during the current MS4 permit cycle to address potential changes to their stormwater management system. The City will rely on the annual storm sewer system infrastructure inspection program described in **BMPs 3D** and **6E** below to maintain awareness of system changes and necessary mapping updates.

Responsible Party: Municipal Stormwater Manager

3.3.4 BMP3D - Dry Weather Outfall Inspection

Permittees must implement a dry weather outfall inspection program that includes all elements outlined in Part IV(C)(3)(e)(i - vii) of the General Permit.

Description:
The City performs annual dry weather inspections of identified stormwater outfalls in its urbanized area on a watershed-based schedule, beginning with the priority watersheds. The inspection program is designed to identify potential illicit discharges within the City's stormwater management system, and is a critical component for minimizing stormwater pollution to receiving waterbodies.

Measurable Goals:
Annually inspect 20% +/- of outfalls within the City's regulated area in order to inspect all outfalls by the end of PY5.

1. Report the number of outfalls inspected each permit year;
2. Annually document inspected outfalls with outfall descriptions and water quality test results; and
3. Track any sources of illicit discharges identified by outfall inspections each permit year.

Implementation:
The City will continue to annually perform its existing dry weather outfall inspection program on a watershed-based schedule, beginning with the priority watersheds. For each outfall, the City will document conditions on a field sheet and verify its map location. If dry weather discharge is present, the discharge will be sampled for temperature, conductivity, chlorine, ammonia, bacteria, and surfactants. The City will track outfalls showing non-stormwater discharges to determine source of the flow. Discharge will be resolved per the City's IDDE Plan. Inspection results will be documented in a database management system or other record keeping system for compliance purposes.

Responsible Party: Engineering

3.3.5 BMP3E - Wet Weather Assessment for Potential Illicit Discharges

Prior to the expiration date of the 2022 MS4 General Permit, permittees must perform a wet weather assessment for the potential for illicit discharges during wet weather events. The assessment will vary by permittee and utilize data from existing studies including those listed in Part IV(C)(3)(f) of the General Permit. The outcome of the assessment will be a list of outfalls identified for wet weather monitoring and testing, if applicable, by the permittee in the next permit cycle and the rationale for including these outfalls. On or before the expiration date of this General Permit, the permittee must identify these wet weather outfalls in its written IDDE plan, identify specific parameters for wet weather monitoring based on the EPA New England bacterial source tracking protocol or other acceptable protocols or methodologies, and specify the timing and frequency of wet weather monitoring to be completed during the term of the next permit cycle. Should the permittee complete this assessment prior to the expiration date of the General Permit and permittee specific DEP Order, the permittee must implement the wet weather monitoring immediately.

Description:
The City will conduct a wet weather assessment in accordance with the 2022 MS4 General Permit Part IV(C)(3)(f), and will incorporate the wet weather assessment into their IDDE Plan by the end of PY5 (6/30/2027).

Measurable Goals:
The City's wet weather assessment will identify all outfalls in the regulated area that have the potential for illicit discharges during wet weather events, identify targeted wet weather outfalls for monitoring during the next permit cycle; and incorporate the wet weather assessment into the City IDDE Plan by the end of PY5.

Implementation:
The City will conduct a comprehensive wet weather outfall assessment over the course of the 2022 MS4 permit cycle. The City will review its GIS data, aerial photography, and available site plans to locate potential wet weather illicit discharges ("hotspots"). Potential wet weather hotspots will be identified as described in the City's IDDE plan. Because there are six urban impaired watersheds, the City will prioritize the work by watershed as follows:

- PY 1 – Penjajawoc Stream watershed;
- PY 2 – Capehart Brook and Arctic Brook watersheds;
- PY 3 – Shaw Brook and Sucker Brook watersheds; and
- PY 4 – Birch Stream watershed.

Responsible Party: Engineering

3.3.6 BMP3F - Identify Allowable Non-stormwater Discharges that Contribute Pollutants

The permittee must include if it has identified any allowable non-stormwater discharges that are significant contributors of pollutants to the MS4. The non-stormwater discharges authorized by the General Permit are listed in Part IV(C)(3)(h) of the permit. If sources are identified, then the permittee must implement measures and/or cooperate with responsible dischargers to control these sources so they are no longer significant contributors of pollutants.

Description:
The City has prioritized water line and hydrant flushing runoff as a municipally generated allowable non-stormwater discharge to its MS4. The Bangor Water District (BWD) is responsible for maintaining all of the fire hydrants located in the municipality. The City's Stormwater Management Team, developed and implemented a standard operating procedure (SOP) for the flushing of all municipally owned hydrants within the regulated urbanized area. This SOP, available upon request, ensures that discharges from the City's MS4 to receiving waterbodies as a result of hydrant flushing activities are not significant contributors of pollutants.

Measurable Goals:
The City will meet the following goals to control pollutant contributions from the City's allowable non-stormwater discharges:

1. Annual review of the City hydrant map, including where discharges drain to the MS4 and receiving waters;
2. Request an annual water quality report from the BWD concerning hydrant flushing activities;
3. All hydrant flushing BWDpersonnel are trained in hydrant flushing BMPs; and
4. Address any other allowable non-stormwater discharges (see General Permit Part IV(C)(3)(h)) that are identified as significant contributors of pollutants to the MS4.

Implementation:
The City will implement the following measures to control pollutant contributions from the City's allowable non-stormwater discharges:

1. The City will work with Bangor Water District to annually review and update the City infrastructure map to maintain location points of all hydrants;
2. The City will request an annual water quality report from Bangor Water District documenting all best management practices implemented for hydrant flushing activity as well as the BWD's testing results of the total residual chlorine for any such discharges; and
3. During each permit year, the City will include a status update on the evaluation of water line and hydrant flushing as a potential significant contributor of pollutants to the MS4, and an update on subsequent actions.

Responsible Party: Municipal Stormwater Manager

3.4 MCM IV - Construction Site Stormwater Runoff Control

Each permittee must implement and enforce a program to minimize or eliminate pollutants in any stormwater runoff from construction activities that disturb one acre or more of land within the urbanized area. Reduction of stormwater discharges from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more.

The City of Bangor selected the following Best Management Practices (BMPs) to meet requirements of MCM IV, ensuring that construction on both public and private property does not impact the City's MS4.

3.4.1 BMP4A - Erosion and Sediment Control Regulatory Mechanism

The General Permit requires that the MS4 permittee have an ordinance or other regulatory mechanism in place that requires the use of erosion and sediment control BMPs at construction sites consistent with the minimum standards outlined in Appendix C of the 2022 MS4 General Permit. Permittees who have an existing ordinance must evaluate and update it as needed within one (1) year of the effective date of this GP. Permittees without an existing ordinance must develop an ordinance within one (1) year of the effective date of this GP and have an approved ordinance in place with the necessary enforcement authority within two (2) years of the effective date of this General Permit.

Description:
The City of Bangor will continue to enforce an existing program to reduce pollutants in any stormwater runoff to the MS4 from construction activities resulting in a land disturbance of greater than or equal to one acre within the City's urbanized area. The City relies on Chapter 500, which applies to a project that disturbs one acre or more of land area and requires a stormwater permit, issued by MDEP, pursuant to the Stormwater Management Law. Chapter 500 Appendix C describes housekeeping performance standards, including construction site waste control, for permitted construction projects.

Measurable Goal:
In PY1, the City will evaluate and update its existing regulatory mechanism, as necessary, to include references to the requirements found in Attachment C of the MS4 General Permit. These requirements include the provisions detailed in the MDEP Chapter 500 Appendix A - Erosion and Sediment Control, Appendix B - Inspections and Maintenance, and Appendix C - Housekeeping. If updates to the City's existing ordinance are required, they will be completed by July 1, 2023.

Implementation:
The City will rely on the MDEP's administration and enforcement of Chapter 500 for all projects resulting in a land disturbance of greater than or equal to one acre in the City. The City may opt to implement and enforce their existing construction site stormwater runoff control program within the municipal boundary and not just the urbanized area.

Responsible Party: Municipal Stormwater Manager

3.4.2 BMP4B - Procedures for Site Plan Review

The MS4 permittee must develop and implement procedures for site plan review that incorporate consideration of potential water quality impacts, erosion control, waste storage, and other elements of this MCM, the ability for the public to comment on such reviews at publicly-noticed meetings, and procedures to consider information submitted by the public.

Description:
The City of Bangor has a Land Development Code Ordinance, Chapter 165 of the City Code, that applies to construction sites. The City Planning Board is authorized to review and act on all site plans for development requiring site plan review. All City Planning Board meetings are open to public attendance and public comment.

Measurable Goals:
The City will meet the following goals for implementing site plan review procedures to address MS4 permit requirements:

1. In PY1, evaluate the Land Development Code site plan review procedures, as applicable to the MS4 program, updating the ordinance as necessary;
2. Notify the City residents of all Planning Board meetings; and
3. Consider all public input related to site plan reviews and actions.

Implementation:
The City will continue implementation and enforcement of its Land Development Code Ordinance, specifically:

1. Throughout the 2022 permit cycle, the City will review and update its site plan review procedures as necessary to incorporate consideration of stormwater runoff control at applicable construction sites;
2. Continue to notify and invite the public to City Planning Board meetings; and
3. Allow for public comment on site plan reviews applicable to MS4 regulation.

Responsible Parties:

- Municipal Stormwater Manager; and
- Code Enforcement Officer.

3.4.3 BMP4C - Procedures for Notification

The permittee's construction site runoff program must include procedures for notifying construction site developers and operators of the requirements for registration under the Maine Construction General Permit and Chapter 500, Stormwater Management.

Description:
As required by the MS4 permit, the City will notify construction site developers and operators of the requirements for registration under the Maine Construction General Permit or Chapter 500. This notification applies to construction activity in the City disturbing one or more acres.

Measurable Goals:
During each permit year, the City will rely on site plan review application documents which include notification of requirement for registration under the MCGP or Chapter 500 requirements. During each permit year,

the City will provide a brief summary of all projects meeting the requirements for notification in the MS4 Annual Report submitted to MDEP.

Implementation:
Construction site developers and operators will be made aware of this requirement through site plan review application documents for applicable projects.

Responsible Parties:

- Municipal Stormwater Manager; and
- Code Enforcement Officer.

3.4.4 BMP4D - Construction Site Inspections and Documentation

The permittee must document construction activity that disturbs one or more acres within the urbanized area. Written procedures for site inspection and enforcement authority must be documented. Construction site inspections must be completed following minimum requirements outlined in Part IV(4)(a)(v)(b) of the General Permit.

Description:
To maintain the effectiveness of construction site stormwater control best management practices (BMPs), regular inspection of control measures is essential. The City will continue to inspect applicable construction projects for erosion and sediment control (E&SC) and good housekeeping/pollution prevention, as required by the MS4 General Permit. The City will also develop a construction site inspection plan, detailing inspection procedures and follow-up actions for applicable construction sites within the regulated area.

Measurable Goals:
The City will meet the following goals for construction site inspections and documentation:

1. By the General Permit effective date (July 1st, 2022), develop written procedures for site inspection and enforcement of E&SC measures;
2. Inspect each applicable construction site for E&SC compliance at least three times during the active earth-moving phase of the operation (see **Attachment C** for a paper example of the electronic form used for these inspections);
3. Inspect each applicable construction site for E&SC compliance annually until the operation reaches substantial completion;
4. Inspect each applicable construction site for E&SC compliance at project completion to ensure that the site reached permanent stabilization and all temporary erosion and sediment controls have been removed;
5. Document all construction inspections, enforcement action and corrective actions taken; and
6. Summarize the inspection program results in the MS4 Annual Report submitted to MDEP each permit year.

Implementation:
Qualified City personnel will perform, or contract with a MDEP certified third party inspector to perform, applicable construction site inspections at a frequency sufficient to determine whether sites are in compliance with the MCGP or Chapter 500. For sites not in compliance, the inspector(s) will provide site operators with guidance on how to come into compliance. Sites which are not brought into compliance with the MCGP within a reasonable period after receiving guidance from the inspector(s) or after other measures are taken by the MS4, will be reported to the MDEP for non-compliance with the MS4 permit.

Responsible Parties:

- Engineering; and
- Code Enforcement Officer.

3.5 MCM V - Post-Construction Runoff Control for New Development and Redevelopment

Each permittee must implement and enforce a program to address post construction stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4.

The City selected the following Best Management Practices (BMPs) for the Post-Construction Stormwater Management MCM of this SMP.

3.5.1 BMP5A - Promote Low Impact Development

The permittee must promote strategies which include a combination of structural and/or nonstructural BMPs appropriate to prevent or minimize water quality impacts.

Description:
The City encourages developers to use low impact development (LID) techniques. The City requires developers to include written confirmation in their site development application that LID techniques were considered and, if LID techniques are not used, an explanation of why LID techniques will not be implemented. Developers and/or construction site operators are notified of LID strategies through municipal Site Plan Review applications, which refer applicants to the MDEP's Chapter 500 requirements regarding LID.

Measurable Goals:

1. The City will promote LID strategies for all applicable site development projects within the Urbanized Area; and
2. The City will solicit an LID statement to be included with each site development permit application.

Implementation:
The City will promote LID as part of its Site Plan Review procedures, relying on Chapter 500 Stormwater requirements and/or the current City ordinance as applicable to each site development project.

Responsible Party: Planning

3.5.2 BMP5B - Post-Construction Discharge Ordinance

Each MS4 permittee must have and implement a post-construction discharge ordinance, or other regulatory mechanism. Per the ordinance, applicable BMPs must be inspected annually to document their proper function and any completed maintenance. This ordinance must also include provisions for the timely correction of any identified deficiencies.

Description:
The City will continue to rely on their existing Stormwater Maintenance Ordinance developed during a previous permit cycle and enacted on October 14th, 2009.

Measurable Goals:

1. The City's Stormwater Maintenance Ordinance will be reviewed and updated to meet curent MS4 General Permit requirements by the end of PY1 (July 1st, 2023);
2. During each permit year the City will ensure applicable post-construction stormwater management BMPs (installed after July 1, 2009) discharging to its regulated MS4 are functioning properly, as required by the General Permit. This includes those that are either privately or municipally owned and operated sites; and
3. A summary of the findings of all post-construction inspections and maintenance completed by the City or applicable property owners for MS4 permit compliance will be provided in the MS4 Annual Report submitted to MDEP each permit year.

Implementation:
The City Stormwater Maintenance Ordinance will be updated to contain the specific requirements:

- The owner or operator of a post-construction BMP must provide the City with an annual report, completed by a qualified inspector documenting that all on-site BMPs are adequately maintained and functioning as intended; and
- If a post-construction BMP requires maintenance, the owner or operator must provide the City with a record of the deficiency and corrective action(s) taken no later than 60 days following the date the deficiency was identified. If 60 days is not possible, then the operator must establish an expeditious schedule to complete the maintenance and establish a record of the deficiency and corrective action(s) taken.

Responsible Parties:

- Planning; and
- Engineering

3.6 MCM VI - Pollution Prevention/Good Housekeeping for Municipal Operations

The objective of this program is to mitigate or eliminate pollutant runoff from municipal operations on property that is owned or managed by the permittee and located within the urbanized area.

The City selected BMPs for the Pollution Prevention/Good Housekeeping for Municipal Operations MCM of this SMP.

3.6.1 BMP6A - Operation and Maintenance Activities

Permittees must inventory and implement written operation and maintenance (O&M) procedures for all municipal operations conducted in, on, or associated with facilities, buildings, golf courses, cemeteries, parks, and open space owned or operated by the permittee that have the potential to cause or contribute to stormwater or surface water pollution. O&M procedures must reduce stormwater pollution to the maximum extent practicable and address stormwater treatment and controls that are used to achieve compliance with the conditions of the permit.

Description:
For previous MS4 permit cycles, the City developed and/or revised an O&M Plan for all activities occurring on municipally owned properties that have the potential to impact stormwater runoff. The O&M Plan contains an inventory of these municipal operations.

The Plan inventory includes, at a minimum, the following activities:

- Automobile Maintenance;
- Hazardous Materials Storage;
- Landscaping and Lawn Care;
- Parking Lot and Street cleaning;
- Roadway Maintenance;
- Pest Control;
- Road Salt Application and Storage;
- Spill Response and Prevention;
- Storm Drain System Cleaning;
- Vehicle Washing; and
- Vehicle Fueling System.

Measurable Goals:

1. The City will annually review and update its inventory of municipal operations that have the potential to cause or contribute to stormwater pollution;
2. The City will evaluate the O&M Plan annually to iteratively improve strategies and practices to eliminate or better control pollutant discharges; and
3. A summary of the O&M activities and any proposed changes to the O&M Plan based on annual evaluations will be provided in the MS4 Annual Report submitted to MDEP each permit year.

Implementation:
The City will update its O&M Plan to meet 2022 MS4 permit requirements by the permit effective date (July 1st, 2022), and review the plan annually thereafter. During all years of the 2022 permit cycle, the City will implement this O&M Plan for municipal activities occurring in the City that have the potential to impact stormwater runoff.

Responsible Party: Municipal Stormwater Coordinator

3.6.2 BMP6B - Municipal Employee Training

The permittee must conduct annual employee training to prevent and reduce stormwater pollution from municipal operations and facilities subject to the MS4 permit. Compliance measures related to trainings must be documented and reported to MDEP annually, including the types of trainings presented, names and trainings of attendees, the percentage of municipal and contract staff, and their occupation, that received training, the length of the training, and training content delivered.

Description:
The City provides municipal employee training on an as needed basis, but at a minimum annually. The training programs focus on municipal activities occurring in the City which have a potential to impact stormwater runoff. Typical municipal operations with this potential have been identified in the O&M Plan in **BMP 6A**.

Measurable Goals:

1. The City will annually evaluate and identify training needs and materials for MS4 staff regarding municipal O&M procedures.
2. Each permit year the City will provide an appropriate employee training program that addresses means to reduce stormwater pollution from municipal operations.
3. The City will document the following MS4 permit compliance measures for each annual training:
    - Types of training presented;
    - Percentage of municipal and contract staff trainees;
    - Occupations of municipal and contract staff trainees;
    - Duration of the training program; and
    - Content delivered during the training program.
4. The City will report compliance measures related to municipal trainings in the MS4 Annual Report submitted to MDEP each permit year.

Implementation:
Each permit year, the City will evaluate and identify specific training needs for municipal and contract staff regarding the City's O&M procedures. The City will then develop and gather materials appropriate for the topic to be presented. Topics to be covered by the training program may include, but are not limited to:

- Maintenance activities, maintenance schedules, and long-term inspection procedures for structural and non-structural stormwater controls to reduce pollutants discharged from the separate storm sewers;
- Controls for reducing or eliminating the discharge of pollutants into the separate storm sewers from streets, roads, highways, parking lots, maintenance and storage yards, fleet or maintenance shops with outdoor storage areas, salt/sand storage locations, snow disposal areas, and waste transfer stations; and

- Procedures for disposing of waste removed from the separate storm sewers and areas listed above in accordance with all regulatory requirements (such as dredge spoil, accumulated sediments, floatables, and other debris).

The City may opt to coordinate employee trainings through a regional effort sponsored by the BASWG. City staff have participated in similar regional training programs as a cost saving measure during previous MS4 permit cycles. Details of regional training approaches by the BASWG for its MS4 members will be provided in the group's SMP submitted under separate cover to MDEP.

Responsible Party:

- Stormwater Coordinator; and
- Environmental Coordinator

3.6.3 BMP6C - Street Sweeping

The permittees must develop and implement a program to sweep all paved streets and paved parking lots maintained by the permittee at least once a year done soon after snowmelt.

Description:
The City of Bangor employs a regular sweeping program on all City owned parking lots and roads. City personnel involved with highway maintenance operations also perform street sweeping. Applicable staff will be trained on all requirements associated with MS4 program compliance.

Measurable Goals:

1. The City will perform street sweeping of all municipally owned/operated roads at least one time each year, as soon as possible after snowmelt;
2. As necessary, the City will modify their winter road and parking lot maintenance program based on annual evaluations of street sweeping activities; and
3. A summary of annual sweeping activities and any program modifications will be provided in the MS4 Annual Report submitted to MDEP each permit year.

Implementation:
During each permit year, the City will continue to implement a sweeping program for all municipally owned parking lots and roads. The City will annually evaluate the effectiveness of their street sweeping program and alter the program, as necessary, to meet their winter maintenance goals. Sweeping of all City owned roads and parking lots occurs as soon as possible after snowmelt.

Responsible Party: Director of Public Works

3.6.4 BMP6D - Catch Basin Inspection and Cleaning

The permittee must develop and implement a program to inspect catch basins and other stormwater structures that accumulate sediment. All catch basins and stormwater structures must be inspected at least once every other year and cleaned with a frequency appropriate to the accumulation identified. Sediments must be removed in accordance with current state law.

Description:
The City's stormwater management system consists of a system of open ditches, catch basins, and interconnecting storm drains collecting runoff and discharging to identified outfalls.

Measurable Goals:
Per MS4 permit requirements, the City will meet the following stormwater structure inspection and cleaning goals:

1. During each permit year the City will inspect and clean (as necessary) storm drains and catch basins in the storm sewer system to meet the following required frequency and conditions:
    - Inspect and clean a minimum of 50% of all catch basins, so that all catch basins are inspected and cleaned over the course of two years;
    - Clean catch basins more frequently if inspections indicate excessive accumulation (50% of the sump is filled) of sediment.
        - If two consecutive inspections show excess accumulation, then the City will clean those catch basins every year.
        - If two annual inspections show a decrease in sediment accumulation to less than 25% of the sump, then inspections can be resumed at a frequency of once every two years.
2. The City will perform opportunistic inspections of the catch basins during the cleaning process to detect potential illicit discharges; and
3. Inspections will be documented in a database system used by the City to manage all MS4 related inspections. See **Attachment D** for an example of the form used for these inspections.

Implementation:
The City will continue to inspect every year and clean as necessary (see measurable goals above) all City owned catch basins at a minimum of every other year.

Responsible Party:

- Municipal Stormwater Coordinator; and
- Director of Public Works

3.6.5 BMP6E - Maintenance and Upgrading of Stormwater Conveyance System

The permittee must evaluate and implement a prioritized schedule, as necessary, for repairing or upgrading the conveyances, structures, and outfalls within the regulated area.

Description:
The City's stormwater conveyance system primarily consists of a system of open ditches, catch basins and interconnecting storm drains collecting runoff and discharging to identified outfalls.

Measurable Goals:

1. During each permit year, the City will continue to evaluate and implement a maintenance schedule for conveyances, structures and outfalls owned and operated by the MS4; and
2. A summary of annual activities will be provided in the MS4 Annual Report submitted to MDEP each permit year.

Implementation:
The City will continue to evaluate their stormwater conveyance system each year. Based on the results of dry weather outfall inspections, catch basin inspections (**BMPs 3D**, **6D**), and other factors, the City will plan and implement (as necessary), a repair schedule of municipally owned conveyances, structures and outfalls.

Responsible Party: Director of Public Works

3.6.6 BMP6F - Stormwater Pollution Prevention Plan (SWPPP)

The permittee must implement written procedures outlined in a stormwater pollution prevention plan ("SWPPP") for operations or facilities that are owned or operated by the permittee and not already regulated under the Maine Industrial Stormwater Program: public works facilities; transfer stations; and/or school bus maintenance facilities. SWPPP implementation must address long-term operation of structural and non-structural controls that reduce stormwater pollution to the maximum extent practicable.

Description:
During the previous permit cycle, the City developed a SWPPP for relevant City operations and facilities. The SWPPP includes compliance with necessary requirements under the most current issuance of the MDEP's Multi-Sector General Permit (MSGP) for Industrial Activities.

Measurable Goals:

1. The City will perform necessary quarterly visual monitoring and other compliance tasks each year, as described in their current SWPPP;
2. The City will make the SWPPP available to appropriate facility staff, MDEP and USEPA staff, and keep a copy of the SWPPP on-site at all times for reference and review;
3. The City will amend the SWPPP to comply with the requirements specified in Part IV(C)(6)(d) of the MS4 general permit by the permit effictive date of July 1st, 2022;
4. The City will further amend the SWPPP within 30 calendar days of completion of any of the following:
    - A change in design, construction, operation or maintenance that may have a significant effect on the discharge or potential for discharge of pollutants including the addition or reduction of industrial activity;
    - Monitoring, inspections, or investigations by City, local, state or federal officials that determine the SWPPP is ineffective in eliminating or significantly minimizing the intended pollutants; or
    - A discharge occurs that is determined by the MDEP to cause or have the reasonable potential to cause or contribute to the violation of an applicable water quality standard.
5. The City will maintain the proper documentation for inspections and monitoring activities;
6. Annual training for SWPPP activities will be provided as part of MS4 related trainings for relevant City staff; and

7. A summary of SWPPP related activities will be provided in the MS4 Annual Report submitted to MDEP each permit year.

Implementation:
During each permit year, the City will implement stormwater pollution control measures, non-numeric effluent limitations, and pollution prevention practices identified in the SWPPP. City staff will perform necessary tasks to maintain compliance with the requirements of the most current issuance of the MDEP MSGP, including quarterly visual monitoring.

Responsible Parties:

- Director of Public Works; and
- Fleet Maintenance Supervisor.

3.7 Impaired Waters BMPs

The MS4 General Permit requires permittees to specifically address discharge(s) to impaired waters that are located within the MS4 regulated area. If a waterbody to which a point source discharge drains is impaired and has an EPA approved total maximum daily load (TMDL), then the SMP must address compliance with the TMDL waste load allocation ("WLA") and any implementation plan.

The City of Bangor has six urban impaired streams within the urbanized area, which are Arctic Brook, Birch Stream, Capehart Brook, Penjajawoc Stream (and tributaries), Sucker Brook, and Shaw Brook. For each of the six streams and their watersheds, progress has been made on identifying and addressing impairments through prevention, best management practices, and/or public education. As such, there is a good basis for understanding potential next steps to mitigate impairments. Details of the work completed to date are contained in Section 1.4 of this SMP, and set the framework for identification of the three BMPs that will be implemented to meet the Urban Impaired Stream requirement of the 2022 MS4 General Permit.

3.7.1 IWBMP1 - Education Campaign to raise citizens' awareness of six (6) Urban Impaired Streams

Description:
The City will educate citizens on Urban Impaired Streams through their website.

Measurable Goals:
A City website landing page describing Urban Impaired Streams will be completed in PY1. In PY2 and 3, web traffic will be directed to the Urban Impaired Streams landing page via advertisements. In PY4, the website will receive only "organic" traffic. In PY5, statistics on webpage traffic will be compiled and assessed to determine how well the citizens of Bangor were reached.

Implementation:
A landing page will be developed describing what an urban impaired stream is, as well as mechanisms that cause stream impairments. There will also be information on what Bangor citizens can do to improve the water quality in the streams. Each stream will also have a landing page, which will include basic information about the stream, its impairment, and any plans to improve the stream such as a watershed-based plan.

Responsible Party: Municipal Stormwater Manager

3.7.2 IWBMP2 - Ditch inspections in six (6) Urban Impaired Stream Watersheds

Description:
The City will inspect publicly owned ditches within the right-of-way in Urban Impaired Stream watersheds.

Measurable Goals:
All publicly owned ditches within the right-of-way in Urban Impaired Stream watersheds will be inspected during the permit cycle.

Implementation:
Inspections will be conducted by drive-by, in dry weather, and will sample all flows into the ditch in accordance with MCM3 dry weather outfall inspections.

Responsible Party: Municipal Stormwater Manager

3.7.3 IWBMP3 - Structural BMP implementation in six (6) Urban Impaired Stream Watersheds

Description:
The City will implement structural BMPs that may include one of the following as a minimum for each watershed during the permit cycle:

A. Treatment of existing impervious cover on public or private property (minimum ½ acre treated); or

B. Stream channel fluvial geomorphological restorations, and/or stabilizations (minimum 300 feet stream length); or

C. Culvert improvements that are sized to 1.2 times the bankfull width of the stream (one public road crossing or a minimum or 30 feet length of private road structure); or

D. Conservation of lands (minimum ½ acre).

Measurable Goals:
One or more structural BMPs may be implemented during the permit cycle to meet the minimum goals in each watershed. In these cases, minimums will be prorated for each structural technique and totaled for each watershed.

Implementation:
The structural BMPs listed above will be implemented in the following ways:

A. Treatment of existing or redeveloping impervious cover may be accomplished by the City or by the City in cooperation with private landowners and developers. For each watershed, a minimum of one-half acre of impervious cover may be treated or removed.

B. In-stream restoration projects will be guided by a qualified design professional, and will focus on improving channel stability in dynamic equilibrium, improving habitat, and improving water quality. A minimum of 300 feet of stream will be treated.

C. Culvert replacements when they are properly sized (at least 1.2 times bankfull width) for the stream flows.

D. Land conservation projects may include deeded restrictions, conservation easements, and attainment of land by land trusts. These areas will serve to improve, conserve, or stabilize stream water quality or habitat. Riparian corridor lengths conserved will be a minimum of 300 feet, and conserved lands will be a minimum of one-half acre.

Responsible Party: Municipal Stormwater Manager

4 General Requirements

4.1 Plan Approval

The City is committed to reduce the discharge of pollutants from its regulated small MS4 to the maximum extent practicable, and maintains the highest standards for stormwater management through regular review, updating, and implementation of this Stormwater Management Plan.

Cassie M Conlow
Signature

3-26-2021
Date

Catherine Conlow, City Manager
Printed Name, Title

4.2 Plan Location and Public Access

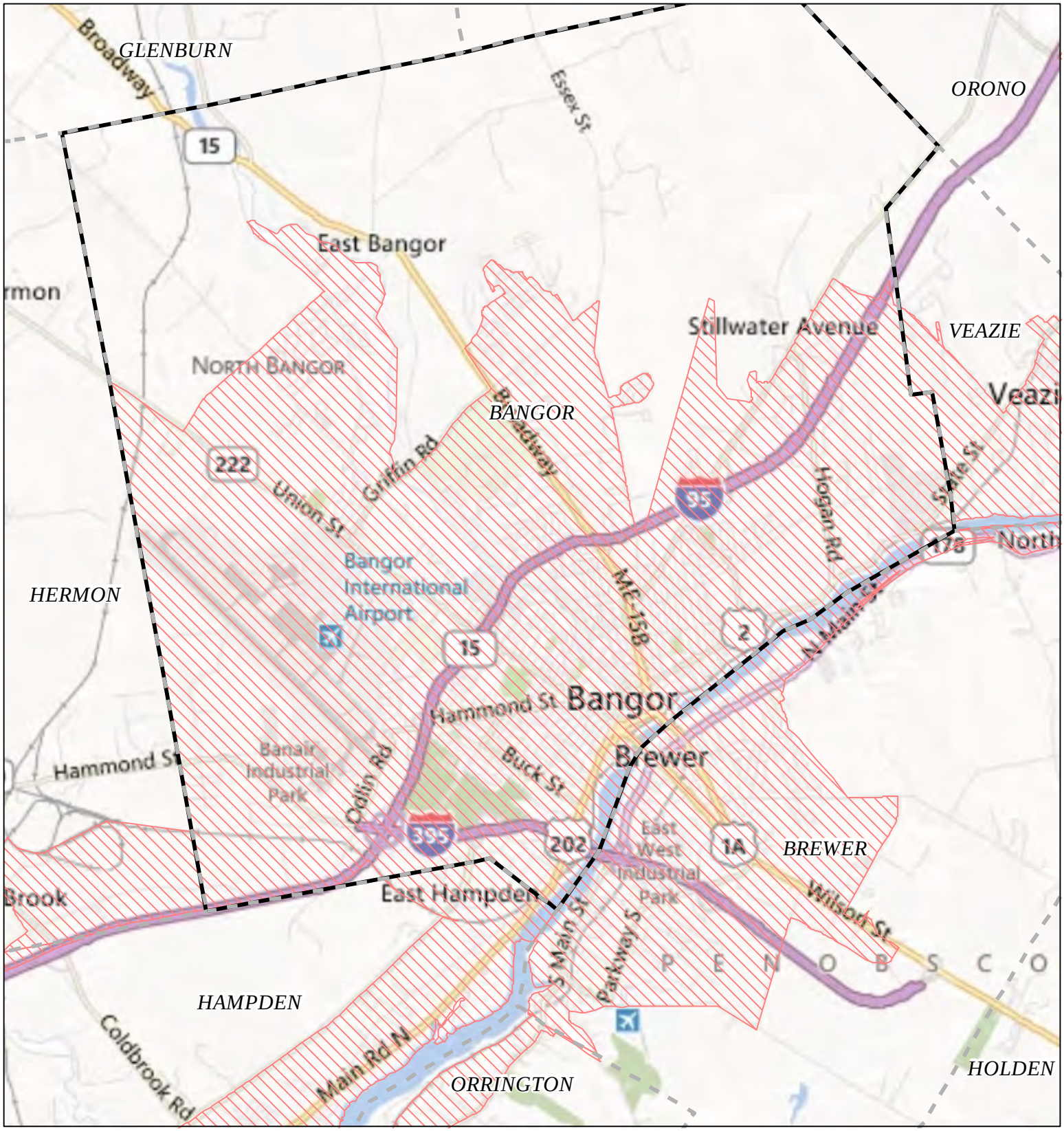
The Stormwater Management Plan and documents will be kept on file at the the City Engineer's Office and on the City website, with a backup copy located at SEE, Inc. in Orono, Maine. Copies and review of documents will be made available when requested by appropriate government agencies and public safety groups.

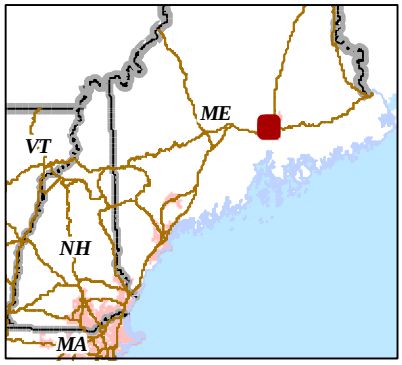
5 References

Portions of the Introduction and select areas of this document were adapted from a SMP Template prepared by Integrated Environmental Solutions for the Interlocal Stormwater Working Group (ISWG).

Attachments

A Urbanized Area map





NPDES Phase II Stormwater Program
Automatically Designated MS4 Areas

Bangor ME

Regulated Area (2000 + 2010 Urbanized Area)

0 1 2 3 4 Kilometers

0 1 2 3 4 Miles

Town Population: 33039

Regulated Population: 31019

(Populations estimated from 2010 Census)

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

US EPA Region 1 GIS Center Map #8824, 11/19/2012

B Illicit Discharge Detection and Elimination (IDDE) Plan

Illicit Discharge Detection and Elimination Plan

City of Bangor, Maine

in compliance with the requirements of
Maine Pollutant Discharge Elimination System
MS4 Permit No. MER041026

March 24, 2021

CONTENTS

I. Introduction

The City of Bangor, Maine, operates a municipal separate storm sewer system (MS4). The MS4 is allowed to discharge stormwater as authorized by the State of Maine in accordance with MS4 Permit No. MER041026.

The MS4 permit requires the permittee to address six Minimum Control Measures (MCMs), the third of which is Illicit Discharge Detection and Elimination (IDDE). This document describes the program the City implements to comply with the MCM 3 IDDE component of the MS4 permit. Details on specific tasks, individual measurable goals, and deadlines are included in the Stormwater Management Plan for each permit cycle.

II. Characteristics of Illicit Discharges

Illicit discharges are waters entering the MS4 that do not consist of non-point source stormwater runoff or acceptable discharges and presumably carry pollutants. Point source discharges to the MS4 are also illicit discharges. Permittees are required to prevent or eliminate all such discharges to the maximum extent practicable.

Illicit discharges can come from such things as runoff from lawn watering carrying pesticides and fertilizers, floor drain connections, and draining swimming pools. Illicit discharges can be direct, such as an improper sanitary sewer connection, or indirect, such as contaminated groundwater flow. They can occur once, for example, a spill; intermittently, such as commercial equipment washing; or continuously, such as through a sewer line improperly connected to a storm drain.

Illicit discharges are detected by different means. Some discharges are reported directly through calls from citizens or City staff, some are discovered through systematic investigations, and others are found while performing sewer maintenance and repair.

A table of typical illicit discharges that might be encountered in a municipal system is located in **Appendix A**. This table is not all-inclusive but shows the general types and characteristics of discharges, the method of detection, and whether GIS analysis can assist in identifying potential locations.

III. Overall Approach

Because the characteristics of illicit discharges to the MS4 vary widely, the City uses a multi-pronged approach to detect and eliminate them.

A. Authority

In 2005, the City passed a non-stormwater discharge ordinance (Appendix B), codified as Chapter 197 of the City's Code of Ordinances. This ordinance was enacted as required by the 2003 MS4 permit. Under this ordinance, unpermitted and non-allowed stormwater discharges are prohibited. The City Engineer is the authority responsible for administration and enforcement and may designate other City staff to undertake enforcement tasks.

The ordinance allows the following non-stormwater discharges to the storm drain system, as long as they do not cause or contribute to violations of water quality standards:

- Landscape irrigation;
- Diverted stream flows;
- Rising ground waters;
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20));
- Uncontaminated pumped ground water;
- Uncontaminated flows from foundation drains;
- Air conditioning and compressor condensate;
- Irrigation water;
- Flows from uncontaminated springs;
- Uncontaminated water from crawl space pumps;
- Uncontaminated flows from footing drains;
- Lawn watering runoff;
- Flows from riparian habitats and wetlands;
- Residual street wash water (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material has been removed and detergents are not used);
- Hydrant flushing* and firefighting activity runoff;
- Water line flushing* and discharges from potable water sources;
- Individual residential car washing;
- Dechlorinated swimming pool discharges;
- Discharges specified in writing by the enforcement authority as being necessary to protect public health and safety; and
- Dye testing, with verbal notification to the enforcement authority prior to the time of the test.

*Discharges of hydrant and water line flushing are required to be dechlorinated if they are to be discharged to a portion of the MS4 system which discharges to a small stream. In accordance with the MDEP 11/18/2016 Issue Profile for Drinking Water System Discharges to Regulated Small MS4s, the Bangor Water District either aerates or dechlorinates during flushing to meet Total Residual Chlorine (TRC) acute water quality criteria. For fresh water, this value is 19 ug/L TRC (adjusted to 50 ug/L, per the MDEP as the reporting limit for available reliable and consistent test methods).

The Bangor Water District flushes the system every year and provides an annual report to the City describing water dechlorination methods in use and testing results for any flushing conducted. The Hydrant Flushing SOP, developed during the previous permit cycle, is kept on file at the Bangor Water District and can be reviewed upon request.

B. Public Awareness

Public awareness of stormwater issues is a critical component of a successful stormwater program. The first two Minimum Control Measures of the MS4 permit consist of public education and involvement. Training in what *does* and *doesn't* constitute an acceptable discharge to the stormwater system is included as part of the City's Stormwater Awareness Plan (for educating the public) and the Permit Awareness Plan (for educating municipal government). Other mechanisms developed and implemented as part of MCMs 1 and 2, such as labeling catch basins that drain to a river or other waterway, also help to prevent illicit discharges.

Information about stormwater and non-stormwater discharges is posted on the City's website at www.bangormaine.gov, along with information about how to report a potential illicit discharge by email or telephone.

C. GIS Mapping

The City has developed a comprehensive GIS that includes features required by the MS4 permit, such as stormwater catch basins, connecting surface and subsurface infrastructure, pipe flow directions, and outfalls. Catch basins are uniquely identified. Outfalls are uniquely identified and attributed by type, material, size, and receiving water body. The GIS also contains supporting data such as natural features, topography, sanitary and combined sewer systems, tax parcels, zoning districts, and streets. The GIS is updated whenever new information is available – on a near-daily basis. Maps can be printed on demand to assist with field work and reporting.

D. Identification of Priority Areas

The City's Stormwater team will identify priority areas where illicit discharges might be present, and identify areas that may need special protection from illicit discharges. Assisted

by contracted service providers, city staff will follow a prioritization method developed by the Center for Watershed Protection. The method consists of the following steps:

1. Dividing the city into areas that can be evaluated for illicit discharge potential.
2. Selecting illicit discharge potential screening factors that apply to one or more of the areas and identifying the criteria that will be used to evaluate each area.
3. Evaluating each area using the screening factors and assigning a numeric score based on their illicit discharge potential.

The city will review the screening factors presented in **Table 1**, below, to assess their applicability to each of the areas. The listing shows which screening factors are retained and which are eliminated, as well as the rationale for elimination.

Table 1: Priority Area Screening Factors

Screening Factor	Retained or Eliminated	Rationale for elimination
Poor dry weather receiving water quality	Retained	
Density of generating sites	Retained	
Density of stormwater infrastructure	Retained	
Size of Subwatershed	Retained	
# Acres in Urbanized Area	Retained	
Average development age	Retained	
Receiving water status (drinking water supply, beaches, shellfish, impaired areas, TMDLs with WLA)	Eliminated	This information is included in screening factor 1.
History of discharge complaints & knowledge of suspect discharges	Eliminated	The City does not have reliable data for this category.
Density of aging septic systems	Eliminated	The City does not have reliable data for this category.
Sewer conversion status	Retained	
Sewer Conversion (previously septic)	Eliminated	This information is included in the previous screening factor.
Historic industrial operations	Retained	
Sewer Crossings/common trench constructions	Retained	
Type of development	Eliminated	This information is included in screening factor 2.

Using the screening factors that are retained as applicable to the City, each drainage area will be evaluated and assigned a score to describe whether the area exhibited a high potential for the factor to be present. Once all the areas are assigned scores for all of the screening factors, the scores will be averaged and a final score for the area will be obtained. A score of three represents a high priority area, a score of two represents a medium priority area, and a score of one represents a low priority area.

The worksheet located in **Appendix H**, shows the prioritization worksheet to be used for each retained screening factor for each of the areas identified in the City. Based on this procedure, areas having the highest normalized priority scores will be determined. As such, illicit discharge inspections will be focused on these drainage areas.

E. Detection of Illicit Discharges

1. Follow-up to Incident Reports

Reports of illicit discharges and potential sources of discharges to the MS4 are received by the City from citizens and municipal staff or from other regulatory agencies. These reports are followed up on immediately by the Environmental Coordinator, who then involves Sewer Maintenance, Public Works, Code Enforcement, and Engineering staff as needed. Incidents are handled in compliance with state and federal regulations and are fully documented in the Incident Report Database.

2. Opportunistic Investigations

Sewer Maintenance and Public Works staff are aware of the MS4 requirements and report any potential issues to the Environmental Coordinator and Engineering. Sewer crews look for possible means of MS4 contamination such as cross-connections between systems, exfiltration from faulty connections or damaged pipes, and floor drains and sanitary lines improperly connected to the storm sewer system.

Public Works crews routinely sweep the roads and clean catch basins. Anomalies, such as excess tracking from construction sites or suspicious waste in a catch basin, are reported to the Environmental Coordinator for follow-up.

3. Systematic Investigations

Systematic investigations include ditch inspections, outfall inspections, and hotspot investigations beginning with GIS analysis to identify potential sources of discharges (for example, uncovered stockpiles). The potential sources are visited in the field to determine if discharges are present or have occurred. Field work may include visual inspection, interviewing occupants or owners of the property, and/or conducting water quality

sampling applying the QAPP (**Appendix I**) as appropriate to make a determination. Potential sources are identified and the results of the investigation are documented.

Systematic investigations are undertaken to verify, sample, and document outfalls as well as to look for industrial and commercial pollutant sources (hot spots), sanitary sewer contamination, and failing septic systems. The specific methodology for each of these investigations is described in Section IV.

F. Elimination of Illicit Discharges

The City tracks the source of dry weather and other illicit discharges in accordance with its IDDE Standard Operating Procedures (SOPs). The IDDE SOP is included in **Appendix C.**

Some discharges, such as pool draining, can be prevented through public awareness and education. Other discharges like sanitary sewer cross-connections can be eliminated through City actions.

Discharges from residences and commercial and industrial properties may require enforcement action. The City through its non-stormwater discharge ordinance (**Appendix B**) has the authority to physically suspend the discharge access to the storm system (§197-6), monitor discharges for pollutants (§197-7), issue notices of violation, and impose fines (§197-8).

Once a potential source of an illicit discharge is identified, the Code Enforcement Officer would contact the responsible party in order to initiate removal or discontinuation of the illicit discharge.

If the illicit discharge is caused by a private entity, the Code Enforcement Officer could issue a Notice of Violation as authorized by the Non-Stormwater Discharge Ordinance (**Appendix B**). In the event the illicit discharge is caused by the City, Public Works would contact the department responsible and work with them to remove or discontinue the illicit discharge. In either case, the City would require the responsible entity to eliminate the illicit discharge within 60 calendar days of identification of the source or would work with the responsible entity to establish an expeditious schedule to remove the illicit discharge.

After the source of an illicit discharge has been removed or remediated, follow-up sampling is conducted in accordance with the QAPP in **Appendix F** as described in the SOP for Tracing Illicit Discharges (**Appendix C**).

IV. Methodology for Systematic Investigations

Systematic investigations generally take place on a watershed-by-watershed basis following the schedule and meeting the goals described in the Stormwater Management Plan for each permit cycle. Investigations follow the IDDE SOPs described in **Appendix C**. Any testing will be done in accordance with the QAPP in **Appendix F**. Dry weather flow or flow from an unknown source will be considered an illicit discharge until the source can be established through field investigation or verified by other means.

A. Outfalls

The City's MS4 permit requires that municipally operated storm drain outfalls be inspected for their physical condition and to determine if dry weather discharges exist. Outfalls with discharges during dry weather may indicate the presence of an illicit connection to the storm drain system or illegal dumping into storm drains. A table of known outfalls is included in **Appendix D**.

Outfall inspections are coordinated by the City Engineer and Environmental Coordinator and are conducted by designated staff following a period of dry weather, defined in this instance as less than a quarter inch of precipitation for 72 hours prior to inspection. Inspections commence in early fall to allow time for any corrective or remedial activities to be undertaken before winter. Typically inspections are completed during the fall and early spring. During summer months inspections cannot be conducted effectively due to vegetation obstructions.

Outfall inspections are conducted on a watershed basis utilizing maps created from the GIS. Inspection information is recorded on an outfall inspection sheet and photographs are taken. A copy of the inspection sheet is included in **Appendix E**.

Data sheets and photographs are filed for reporting and recordkeeping purposes. The most recent inspection date is entered into the GIS as an attribute for each outfall.

Outfalls with physical deficiencies are flagged for corrective action, and a work order is created for the Public Works Department. Physical deficiencies include but are not limited to broken or separated pipes, eroded channels, and sediment accumulation.

Outfalls that discharge a flow during dry weather inspections are tested for temperature, DO, conductivity, chlorine, ammonia, bacteria (*E. coli* or human Bacteroides), and surfactants or optical brighteners. Test strips are used to test for free and total chlorine as well as ammonia. *E. coli* testing is conducted at the City WWTP. Sampling and monitoring is conducted in accordance with the QAPP (**Appendix F**). If any of the required parameters are beyond the threshold limits outlined in the QAPP, the outfall is flagged for additional monitoring to determine the source of dry weather flow based on the City's IDDE Standard Operating Procedures (**Appendix C**).

Information from the outfall inspection sheet, photographs, source tracking, test results, and any follow-up actions are recorded electronically. Reports on inspections are included in the MS4 annual reports.

B. Open Ditches

The open roadside ditches that convey stormwater are monitored by Public Works crews as part of their daily work. Areas in need of maintenance or repair are noted, and work is scheduled to be completed as soon as practicable.

The City also conducts drive-by inspections of ditches in priority watersheds on a rotating schedule. Signs of erosion and infiltration are noted for follow-up. Incoming pipes are mapped, and unknown pipes are traced in accordance with the City's IDDE SOP (**Appendix C**). Any dry weather flow is noted for follow-up investigation per the City's IDDE SOP, and will also be traced until the source is determined. A copy of the ditch inspection sheet is included in **Appendix E**.

V. Coordination with Adjacent MS4s

The City of Bangor maintains communication with all adjacent and nested interconnected MS4s in order to facilitate a quick and coordinated response to any possible illicit discharges that may leave or enter its storm sewer system either from the City itself or from a neighboring MS4. Contact information and documentation of correspondence with interconnected MS4s, including any coordinated responses to illicit discharge events, is contained in **Appendix G** of this IDDE Plan.

VI. References

Casco Bay Estuary Project. "Guidelines and Standard Operating Procedures for Stormwater Phase II Communities in Maine." n.d.

Center for Watershed Protection. Illicit Discharge Detection and Tracking Guide. Ellicott City, MD: Center for Watershed Protection, 2011.

Johnson, Barry and Dean Tuomari. "From Theory to Implementation - Finding Illicit Connections." WEF Proceedings. Denver, 1998.

New England Interstate Water Pollution Control Commission. Illicit Discharge Detection and Elimination Manual: A Handbook for Municipalities. Lowell, MA: NEIWPCC, 2003.

Pitt, Robert and Center for Watershed Protection. Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments. Washington, DC: EPA, 2004.

Pitt, Robert, et al. Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems. Washington, DC: EPA, 1993.

State of Maine, Department of Environmental Protection. General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems. 2013.

US Environmental Protection Agency. "EPA New England Bacterial Source Tracking Protocol - Draft." 2012.

VII. Appendices

Appendix A – Typical Illicit Discharges to an MS4

Discharge	*Type*	*Timing*	*Detection Method*	*GIS Pre-ID*
Illegal dumping	Direct	One Time	call	no
Swimming pool discharges	Direct	One Time	call	no
Spills	Direct	One Time	call, DEP	no
Wash downs (residential)	Direct	One Time	call	no
Vehicle accidents	Direct	One Time	call, Police, DEP	no
Sanitary sewer overflows	Direct	One Time	call, Sewer Dept.	no
Wash downs (commercial, industrial)	Direct	Intermittent	call	no
Irrigation and lawn watering	Direct	Intermittent	call	no
Vehicle fueling and maint. areas	Direct	Intermittent	field survey	yes
Cross-connections from sanitary system	Direct	Continuous	Sewer Dept.	yes
Direct sanitary wastewater connections	Direct	Continuous	Sewer Dept.	no
Floor drain connections	Direct	Continuous	Sewer Dept.	no
Industrial outdoor material storage	Direct	Continuous	field survey	yes
Road maint. and landscape stockpiles	Direct	Continuous	field survey	yes
Damaged sanitary lines (exfiltration)	Indirect	Continuous	Sewer Dept.	yes
Failing septic systems	Indirect	Continuous	field survey	yes
Contaminated groundwater	Indirect	Continuous	sampling	no

Appendix B – Non-Stormwater Discharge Ordinance

The City of Bangor's Non-Stormwater Discharge Ordinance (Chapter 197 of the City's Code of Ordinances), adopted on June 25, 2005, can be found online at: https://ecode360.com/6893278.

Appendix C – IDDE Standard Operating Procedures

The following pages contain the Standard Operating Procedures (SOPs) followed by the City of Bangor for:

- Detecting illicit discharges via outfall inspections,
- Detecting illicit discharges via opportunistic or ditch inspections, and
- Tracing illicit discharge sources.

Standard Operating Procedures for
Outfall Inspections

General Guidelines

Never work alone.

Never put yourself in danger.

Never enter private property without permission.

Field Procedures

Conduct inspections during dry weather periods. (For purposes of this SOP, dry weather is considered to be a 72-hour period with less than ¼ inch of precipitation.)

Record observable data on the Outfall Inspection Sheet.

Photograph outfall with digital camera.

Record evidence of past illicit discharge such as staining or residuals.

Trace upstream to locate the source. If the source cannot be determined in the field, record it as such.

If the flow is observed, describe the magnitude of flow and record any colors, odors, or turbidity.

Test flow following the QAPP

Equipment list

Paper maps (or tablet GIS)	Outfall inspection sheets
Digital camera with time stamp	Cell phone
Clip boards and pencils	First aid kit
Flash light	Surgical gloves
Tape measure	Watch
Sampling equipment and bottles	

Follow-up Procedures

Enter inspection date into GIS.

Label and file inspection sheets and photographs.

For sources that could not be determined in the field, the discharge is considered illicit until proven otherwise. Follow the SOP for Tracing Illicit Discharges.

Maintain records on inspections and follow-up procedures for reporting.

Standard Operating Procedures for
Opportunistic or Ditch Outfall Inspections

General Guidelines

Never work alone.

Never put yourself in danger.

Never enter private property without permission.

Field Procedures

Record observable data.

Assess general area to identify the source of the discharge.

Contact Environmental Coordinator or Engineering for assistance in identifying source with GIS or other records.

If the source cannot be determined in the field, record it as such.

Photograph outfall or discharge with a digital camera.

If the flow is observed, describe the magnitude of flow and record any colors, odors, or turbidity.

Test flow following the Sampling Protocol.

If the source of flow has not been determined, collect samples following the QAPP

Follow-up Procedures

Add outfall or discharge point into GIS in accordance with the naming scheme.

Label and file inspection sheets and photographs.

For sources that could not be determined in the field, the discharge is considered illicit until proven otherwise. Follow the SOP for Tracing Illicit Discharges.

Maintain records on inspections and follow-up procedures for reporting.

Standard Operating Procedures for
Tracing Illicit Discharges

General guidelines

Never work alone.

Never put yourself in danger.

Never enter private property without permission.

Office Procedures

Review observed data and investigation reports.

Review information such as engineering records, code enforcement records, site plans, and GIS data to determine possible sources.

Review sampling results to help further determine the source, for example, gray water or sewage.

Field Procedures

Use any one or a combination of the following procedures to determine the source of the illicit discharge:

For flowing discharges, use visual tracing and dye testing as needed.

Non-flowing discharges, inspect storm drain access points for staining or residual evidence, and use dye testing if necessary.

For suspected sewage contamination, televise the sewer lines in the vicinity as needed to look for exfiltration or illicit connections.

For high priority illicit discharges that are difficult to detect, use smoke testing or televise the storm drain system.

For an illicit discharge at the outfall of a network of pipes, use systematic sampling at junction points as needed to pinpoint the direction of flow and isolate the source.

For non-flowing pipes in a network where dye testing is impractical, use sandbagging to capture flow for sampling, if needed.

After identifying and removing the source of illicit discharge:

Conduct follow-up testing according to the Sampling Protocol after removing a source of illicit discharge to verify that the removal was successful and that no other sources are present.

Appendix D – Known Stormwater Outfalls in Bangor by Watershed

Watershed	*MS4 Outfalls*	*City Owned Outfalls*	*All Mapped Outfalls*
ARCTIC BROOK	29	29	53
BIRCH STREAM	4	4	12
CAPEHART BROOK	5	5	9
CEMETERY BROOK	3	3	22
GREAT BROOK	0	4	5
KENDUSKEAG STREAM	33	37	42
MEADOW BROOK (PENJAJAWOC)	2	2	13
OSGOOD BROOK	2	9	14
PENOBSCOT RIVER	21	24	38
PENJAJAWOC STREAM	25	31	71
SHAW BROOK	4	4	13
SUCKER BROOK	5	6	28
WOODLAWN BROOK	6	8	12
Total Outfalls	139	166	332

This list was compiled from GIS data available as of March 2021. The list includes all outfalls in the city for mapping purposes, however only MS4 outfalls are included in the MS4 dry weather outfall inspection program. This data is subject to change because the GIS data is modified frequently to improve accuracy and completeness. Changes will be included in the annual MS4 reports.

Appendix E – Ditch Inspection Sheet

City of Bangor

MS4 IDDE Ditch Inspection Sheet

Date _____ Inspector _____ Inspector Initials _____ Area (map section, watershed, etc.) _____

Ditch	Location (road name, site name, etc.)	Description	Debris present	Pipes or other outfalls entering ditch	Signs of discharge entering ditch	Comments	Photos
ex:	Main St between 2nd St and 3rd St	shallow, grassed with culverts under driveways	some litter	none	none	possible failing culvert at driveway to house no. 125	IS3 and IS4
1							
2							
3							
4							
5							
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15							

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Appendix F – Quality Assurance Project Plan for MS4 Dry Weather Outfall Monitoring

Quality Assurance Project Plan for MS4 Dry Weather Outfall Monitoring

1 Overview

The purpose of this Quality Assurance Project Plan (hereafter referred to as the QAPP) is to describe the actions that the MS4 permittee will undertake in order to comply with requirements of the Maine Pollutant Discharge Elimination System (MEPDES) Municipal Separate Storm Sewer System (MS4) General Permit. Data generated by this plan will be included, as required by the General Permit, in the MS4 Annual Report to the Maine DEP.

1.1 Acknowledgement

This QAPP is based on a Stormwater Monitoring QAPP developed by Integrated Environmental Engineering, Inc. for municipalities in Maine. Permission to use content from Integrated Environmental's QAPP was granted by Kristie L. Rabasca, P.E.

2 Background and Scope

In Maine, there are 30 municipalities (permittees) regulated by the 2022 Maine General Permit for Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4 General Permit). As part of the MS4 General Permit requirements, the municipalities must conduct dry weather inspections on 100% of their outfalls during the 5-year term of the MS4 General Permit.

2.1 Requirements for Outfall Monitoring

Under most conditions, if an outfall is observed to have dry weather flow, monitoring must be conducted to assess whether there is an *illicit discharge* associated with the flow. An illicit discharge is any discharge to a regulated MS4 system that is not composed entirely of stormwater other than:

- discharges authorized pursuant to another permit issued pursuant to 38 M.R.S. §413;
- uncontaminated groundwater;
- water from a natural resource (such as a wetland); or
- other Allowable Non-Stormwater Discharges identified in Part IV(C)(3)(h) of the MS4 General Permit.

Exempt conditions for dry weather outfall sampling and monitoring are described in Part IV(C)(3)(e)(vi) of the 2022 MS4 General Permit.

Monitoring must be conducted whether or not the outfall's dry weather flow exhibits evidence of an illicit discharge. Where dry weather flow is present at an outfall, the permittee must sample the

discharge and analyze for the following parameters:

- E. coli, enterococci, total fecal coliform or human bacteroides;
- Optical enhancers or surfactants;
- Ammonia;
- Total residual chlorine;
- Temperature; and
- Conductivity.

Data from sampling and analysis can be used to determine if there is an illicit discharge present in the flow and can help to identify potential sources of the illicit discharge.

2.2 QAPP Purpose

The purpose of this Quality Assurance Project Plan (QAPP) is to provide sampling personnel information that will assist them in collecting samples and analyzing them using field equipment/test kit(s) and/or laboratories in a manner that ensures sufficient accuracy and precision for identifying or ruling out the presence of illicit discharges in dry weather outfalls. This QAPP provides information on various field equipment/test kit(s) and analytical methods available to permittees that can be used to comply with the MS4 permit requirements for dry weather outfall monitoring.

This QAPP has been developed to accompany a municipality's Illicit Discharge Detection and Elimination (IDDE) Plan, which is required by the MS4 General Permit. The QAPP itself does not contain all the IDDE requirements associated with the MS4 permit, so the municipality's IDDE Plan should be consulted to determine the specific monitoring requirements and schedules. In addition, if an inspection finds evidence of an illicit discharge, the municipality must investigate to identify the source and work with responsible parties to remove the source. The IDDE Plan describes the processes and procedures specific to a municipality for such follow-up investigations.

3 Sampling Procedures

3.1 Sample Collection

Samples are required to be collected at outfalls that exhibit dry weather flow (defined as flow after there has been no precipitation greater than ¼ inch for 72 hours, and there is no melt water from snow or ice). Because dry weather flow can be intermittent and/or highly variable in short periods of time, personnel should be prepared to collect samples during any outfall inspection.

Samples are collected only from a flowing source, and where the pipe outlet has at least 1 or 2 inches of free-flowing drop before any standing water or pool below it (as in Fig. 1, below). Outfalls may not offer a clean catch of discharge (as in Fig. 2, below), and when this is the case, an alternative sampling

option should be considered, such as sampling upstream structures or using sand bags around the outfall to prevent contamination from backflow. Stagnant water should not be sampled unless the municipality deems it necessary.

Fig. 1. This outfall provides a good opportunity for a clean catch of its discharge.

Fig. 2. This outfall is partially submerged and a clean catch of its discharge is not possible.

3.2 Sampling equipment

If dry weather flow is present, the outfall is safely accessible, and a clean catch can be made, then monitoring should be conducted. **Table 1** provides a list of equipment that should be gathered and available for outfall monitoring. All samplers should be trained on the proper use and basic maintenance of field equipment prior to employing field methods. This includes training on calibration of analytical equipment used in the field, handling and disposal of field test kit components, and methods to minimize cross-contamination between samples.

After sampling events, any reusable sample collection containers are cleaned with soap and tap water. Cleaning is completed in a location where wash water can be discharged to a licensed wastewater treatment plant, sanitary sewer, or septic system.

Table 1. Field Equipment for Monitoring

1 Gallon of Distilled or de-ionized water for rinsing, and squirt bottle
1 Roll Paper towels
3-5 clean plastic 250 ml beakers for water sample collection in plastic bag marked “Clean” or disposable whirl-pak bags.
Garbage bags
1 long sampling pole and/or sampling pump and tubing
Equipment to remove and access catch basin covers if needed (hook/magnet, hammer, crowbar, etc.)
Field equipment/test kits (see Table 2) and bottles for any laboratory samples or off-site field test kits. • Ensure field test kits have not expired • Typically keep bottles available for 5-10 samples
Non-latex gloves
Box of 1-gallon plastic bags
Cooler with ice
Camera or phone
Safety Vest
Scissors
Sunscreen and bug spray
Clip board
3-5 Field Data Sheets (See Addendum 1)
Mobile device with application for digital data collection (e.g. Fulcrum)
Chain of Custody (See Addendum 2)
Sharpies and water-proof pens
Packing tape and Duct tape
Sheet of blank labels for bottles
First aid kit

3.3 Sample documentation

For each outfall sampled, a device with a mobile inspection data collection application (e.g. Fulcrum app), or a paper form as a backup, is used to document the date, time, and location of sample(s) collected, weather conditions, any general observations related to the tests being performed, and results of any parameters analyzed using field equipment or test kits. Note that the data collection form has a place to document sample observations including odor, color, turbidity, presence of algae, etc. These observations will be documented in addition to the observations made during the normal outfall inspection (which should be conducted in accordance with the MS4's IDDE Plan or SOP).

Sample bottles that will be taken away from the sampling site for analysis will be labelled with the date, time, and sample location as well as the name of the sampler. Example labels are provided in **Addendum 1** along with an example field data collection form.

When using a third-party laboratory for any off-site analysis, sample bottles should be obtained before the sampling event. Coordination with the laboratory is also recommended to ensure that sample hold times and preservation requirements are being met. If samples are being collected on a Friday, the laboratory may need prior notice to meet short hold times. Analytical methods, hold times, and other pertinent information is described in Section 4 of this QAPP.

4 Analysis methods

The MS4 General Permit does not require samples to be analyzed using Clean Water Act (CWA) Methods published in 40 Code of Federal Regulations Chapter 136. The use of field equipment/ test kit(s) and laboratories are both allowed. The MS4 General Permit does not require samples to be analyzed by a laboratory that is certified by the Maine DEP. However, this QAPP specifies that when a commercial laboratory is used for a CWA method, it will be certified by the Maine DEP for the CWA method specified.

A list of commercial certified laboratories is available on the Maine DEP website at: https://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml.

Note also that many Wastewater Treatment Plants conduct bacteria analysis for operational purposes. If there is a Wastewater Treatment Plant in the area, it can also be used for the bacteria screening. This QAPP does not specify CWA methods or Maine DEP certification for use of field equipment/test kit(s) or *E. coli* testing.

Table 2 provides information related to sampling parameters, analysis methods, and sample preservation and hold times that may be used during dry weather outfall monitoring. Analysis methods specified in **Table 2** include CWA methods, field equipment, and test kits, where applicable. **Table 2** also provides information on when a particular analysis method might be preferable if there are

multiple options for a given parameter. Prior to sampling, the sampler and Stormwater Coordinator will determine what analysis method (CWA Method, field equipment, or test kit) will be used.

Test kit components that have expired will not be used and test kits will be replaced if/when they reach the end of their useful lives.

Dissolved oxygen, pH and conductivity meters are calibrated each day prior to use. The calibrations are documented electronically in a spreadsheet. Probes that have useful life limits are replaced following the manufacturers recommended schedule.

User manual(s) and safety data sheets (SDS) for field equipment and/or test kit(s) that will be utilized for dry weather monitoring are maintained electronically or in paper form, easily accessible to the field personnel who will be conducting the monitoring.

Table 2 Sampling Parameters, Analysis Methods, and Sample Preservation and Holding Times

Bacteria - select one or more based on discharge environment	CWA Method, Field Equipment, or Test Kit	Preservation	Holding time	Bottle needed	Notes on Use
Bacteria - E. coli	SM 9223 B (IDEXX Colilert Quanti-Tray) EPA 1603 (membrane filtration, MF) Or SM 9221 B (Most probable number, MPN)	Ice	To lab within 6 hours Analyze within 2 hours of receipt	120 ml or 250 ml plastic sterile bottle with lid from lab	Use for discharges to freshwater (with ammonia and either optical enhancers or surfactants)
Bacteria - enterococcus	SM 9230 B, C or D, (MPN including IDEXX Enterolert, or MF) EPA 1600 (MF)	Ice	To lab within 6 hours Analyze within 2 hours of receipt	120 ml or 250 ml plastic sterile bottle with lid from lab	Use for discharges to salt water (with ammonia and either optical enhancers or surfactants)
Bacteria – Fecal Coliform	SM 9222 D (MF CFU/100ml) Or SM 9221 C, E (Multitube MPN/100ml)	Ice	To lab within 6 hours Analyze within 2 hours of receipt	120 ml or 250 ml plastic sterile bottle with lid from lab	Use for discharges to salt or freshwater (with ammonia and either optical enhancers or surfactants)
Bacteria – Human Bacteroides	Labs: EMSL (NJ), Microbial Insights (TN) or Source Molecular (FL)	Ice	To lab within 24 hours Analyze within 48 hours	1000 ml plastic bottle with sodium thiosulfate from lab (with insulated shipping box)	Use for discharges to salt or freshwater (with ammonia and either optical enhancers or surfactants). Not a CWA method, so Maine Laboratory certification not required.

Table 2 Sampling Parameters, Analysis Methods, and Sample Preservation and Holding Times

Ammonia (select one method)	CWA Method, Field Equipment, or Test Kit	Preservation	Holding time	Bottle needed	Notes on Use
Ammonia	Ammonia Test Strips	None	Immediate (w/in 15 minutes) in Field	Field jar or beaker	
Ammonia	Laboratory Method EPA 350.1/350.2	Sulfuric Acid (pH <2) + Ice	28 days	250 ml plastic bottle from lab	
Ammonia	Hach DR300 Pocket Colorimeter Ammonia Nitrogen or LaMotte 3680-01 DC1200 Colorimeter test kit	None	Immediate (w/in 15 minutes) in Field	Field jar or beaker	Reagent contains Mercury, Generates a Toxic Hazardous Waste (D009) instructional video (10 minutes): https://www.youtube.com/watch?v=hFiEEEAmWFo
Total Residual Chlorine (select one method)	CWA Method, Field Equipment, or Test Kit	Preservation	Holding time	Bottle needed	Notes on Use
Chlorine	Field kit – Hach Colorimeter II low range	None	Immediate (w/in 15 minutes) in Field	Field jar or beaker	Instructional video available at: https://www.youtube.com/watch?v=WTTUD0Hq1Vw
Chlorine	Industrial test Systems Ultra-Low Total Chlorine Test Strips and other mid range chlorine test strips	None	Immediate (w/in 15 minutes) in Field	Field jar or beaker	As of 6/2020, USEPA had not used Ultra low chlorine test strips (0.2 to 0.5 mg/L). Informal review shows these should be used simultaneously with a mid range (0.5 to 10 mg/l) test strips to double check range.
Temperature and Conductivity (use both)	CWA Method, Field Equipment, or Test Kit	Preservation	Holding time	Bottle needed	Notes on Use
Temperature	Temperature/ Conductivity probe	None	Immediate (w/in 15 minutes) in Field	Field jar or beaker	Use to distinguish between groundwater and surface water.
Conductivity	Temperature/ Conductivity probe	None	Immediate (w/in 15 minutes) in Field	Field jar or beaker	Use to distinguish between salt water and fresh water.

Table 2 Sampling Parameters, Analysis Methods, and Sample Preservation and Holding Times

Optical Enhancers or Surfactants (select one)	CWA Method, Field Equipment, or Test Kit	Preservation	Holding time	Bottle needed	Notes on Use
Surfactants	SM5540C	Ice	To lab within 24 hours Analyze within 48 hours	500 ml plastic bottle from lab	Works on most soaps (laundry detergent, personal care products, dish soap)
Surfactants	CheMetrics K-9400 field test kit	None	Immediate (w/in 15 minutes) in Field	Field jar or beaker	Works on most soaps (laundry detergent, personal care products, dish soap). Contains alcohol and chloroform. Generates a Flammable (D001) and Toxic (D022) Hazardous Waste. Do not use test kit in the field unless licensed to transport hazardous wastes. Instructional Video available at: https://www.youtube.com/watch?v=6vwiZgWqa04
Optical brighteners	VWR handheld UV lamp: UV-A: 360-365 nm, model number 89131-488	None	Analyze within 7 days	Unbleached cotton pad wetted with sample placed in sealed baggie	Works only on water with high to moderate laundry detergent. Provides only presence/absence.
Optical brighteners	Maine Healthy Beaches Fluorometer ($15,000 unit)	None	Keep in a dark container, provide to MHB in 1-2 days, analyze within 7 days	Whirl bag or 100 ml plastic bottle.	Provides semi-quantitative numeric fluorescence of sample. Need to provide sample to MHB in bottle or whirl bag (in a box or cooler). One week hold time. Provide advanced notice to coordinate delivery to office. Organic matter or tannins, or color will interfere.

Table 2 Sampling Parameters, Analysis Methods, and Sample Preservation and Holding Times

Other Optional Parameters	CWA Method, Field Equipment, or Test Kit	Preservation	Holding time	Bottle needed	Notes on Use
Dissolved Oxygen	Hach DO Test kit Model OX-2P DO Probe	None	Immediate (w/in 15 minutes) in Field	Field jar or beaker	Waters of the state have Dissolved Oxygen standards. This test can show whether outfall contributions are affecting Dissolved Oxygen content of receiving waters.
pH	EPA method 4500-H+B pH Probe	None	Immediate (w/in 15 minutes) in Field	Field jar or beaker	Waters of the state have pH standards. This measurement can show whether outfall contributions are affecting the pH of receiving waters.
Total Phosphorus	EPA 365.3	Sulfuric Acid (pH <2) + Ice (4°C)	28 days	250 ml glass bottle from lab.	Provides data regarding nutrient contributions to receiving waters which can originate from paved surfaces, fertilizers, and eroding soils.
Personal Care Products	EPA 1694	Sulfuric Acid (pH <2) + Ice (4°C)	7 days to extraction 40 days after extraction	1000 ml amber jar	EPA Lab Chelmsford can run if capacity. Contact Todd Borci. Otherwise need to use a commercial laboratory. EPA recommends analyzing only for following subset: Caffeine, 1,7-DMX (metabolite of caffeine), Acetominophen, Carbamazepine (anti-depressant), Primidone (anti-epilepsy drug), Atenolol (high Blood pressure med), Cotinine (metabolite of nicotine), urobilin (by product of hemoglobin breakdowns), Azithromycin (antibiotic)

Table 2 Sampling Parameters, Analysis Methods, and Sample Preservation and Holding Times

Other Optional Parameters	CWA Method, Field Equipment, or Test Kit	Preservation	Holding time	Bottle needed	Notes on Use
Total Suspended Solids	EPA 160.2 or SM2549D	Ice	7 days	1000 ml plastic bottle from lab	
Biochemical Oxygen Demand	EPA 405.1 or SM5210B	Ice	To lab within 24 hours, analyze within 48 hours	300 mL BOD bottle	Provides general water quality information.
Total Petroleum Hydrocarbons DRO and GRO	SW 8015C	Ice	7 days to extraction 40 days after extraction	500 ml amber glass jar and 3 40 ml VOA containers from lab with sulfuric acid	DRO is Diesel Range Organics (C10 to C28) GRO is Gasoline Range Organics (C5 to C10)
Nitrate + Nitrite	SM 4500 or EPA 300	Sulfuric Acid (pH <2) + Ice (4^{o}C)	28 days	125 ml plastic bottle from lab	Provides data regarding nutrient contributions to receiving waters which can originate from paved surfaces, fertilizers, eroding soils or wastewaters.
Total Kjeldahl Nitrogen	SM 4500 or EPA 300	Sulfuric Acid (pH <2) + Ice (4^{o}C)	28 days	1000 ml amber glass bottle from lab	Provides data regarding nutrient contributions to receiving waters which can originate from paved surfaces, fertilizers, eroding soils or wastewaters.

5 Quality Control

5.1 Reporting Limits

The following are the reporting limits required by the MS4 General Permit:

Ammonia: 0.5 mg/L
Surfactants: 0.25 mg/L
Total Residual Chlorine: 0.05 mg/L
E. coli bacteria 4 cfu/100 ml
Enterococcus 10 cfu/100 ml

To ensure that data collected meet the required reporting limits, the MS4 permittee will use either a Maine Certified Laboratory or one of the field equipment/test kit methods listed above in **Table 2** to assess dry weather flow.

Maine Certified Laboratories have standard reporting limits for the parameters that conform to the MS4 General Permit required reporting limits.

Each of the test kits listed above in **Table 2** has a use range that is appropriate for the work being conducted, and which meets the MS4 required reporting limits.

5.2 Equipment or Rinsate Blanks

For most instances, dedicated equipment and containers are used to collect samples, so that equipment and rinsate blanks are not required to be collected and analyzed. However, if equipment or collection containers are being used multiple times in the field for different sample locations, they should be rinsed with distilled water in between samples, and the rinsate disposed of away from the collection site. The USEPA Volunteer Monitor's Guide to Quality Assurance Project Plans has additional information on how to complete these tasks.

6 Field Data Sheets and Chain of Custody

As described in Section 3.3, a mobile inspection application will be used to digitally document sample collection. The application will document the type of field equipment or test kit(s) used and results of any field analysis. A list of parameters documented are provided in **Addendum 1** to this QAPP.

Whenever samples will be sent to a laboratory or transported for off-site analysis, a Chain of Custody will be used to document sample collection dates, times, analytical methods requested, and custody of the sample from the time it was collected, until the time it was analyzed. Example Chains of Custody are provided in **Addendum 2** to this QAPP.

7 Data Reports

Information and monitoring data collected on the mobile inspection application shall constitute data reports for analyses using field equipment or test kits.

Whenever samples are sent to a laboratory for analysis, data reports are provided by the laboratory showing the sample location, date and time of collection, results of the analysis, date and time of analysis, the reporting limit, the person who conducted the analysis, and the analytical method used.

8 Data Review and Follow up

Once all results have been received, they will be reviewed by the Stormwater Coordinator. Data shall also be stored electronically or in paper format for at least 3 years following the expiration date of the MS4 General Permit, as required by the MS4 General Permit.

If the person collecting the sample is the Stormwater Coordinator, they may opt to have another municipal staff person review the data, or a Stormwater Coordinator from another municipality if they deem it necessary to assist in the overall investigation. Data should be reviewed within 2 weeks of receipt and additional investigations should be implemented to identify the source of any potential illicit discharge if any of the thresholds in **Table 3** are exceeded.

Table 3. Thresholds for Additional Investigation

Parameter	Threshold Level for Additional Investigation	Notes/Discussion
E. coli	236 cfu/100 ml – discharges into freshwater rivers or streams	All classifications of flowing fresh surface water in Maine (AA, A, B and C) have a standard that no more than 10% of the samples may exceed this concentration in any 90 day interval. A fresh surface water is at risk of impairment if it is receiving significant discharges from human sources above this concentration.
E. coli	194 cfu/100 ml – discharges into freshwater ponds	Great Ponds and lakes less than 10 acres have a standard that no more than 10% of the samples may exceed this concentration in any 90 day interval. A water of this type is at risk of impairment if it is receiving significant discharges from human sources above this concentration.
Enterococci	54 CFU/100 ml – discharges into saline/estuarine Class SA or SB	These waters have a standard that no more than 10% of the samples may exceed this concentration in any 90 day interval. A water is at risk of impairment if it is receiving significant discharges from human sources above this concentration. (Note Maine Healthy Beaches threshold is 104 MPN/100 ml)
Enterococci	94 CFU/100 ml – discharges into saline/estuarine Class SC	These waters have a standard that no more than 10% of the samples may exceed this concentration in any 90 day interval. A water is at risk of impairment if it is receiving significant discharges from human sources above this concentration. (Note Maine Healthy Beaches threshold is 104 MPN/100 ml)

Parameter	Threshold Level for Additional Investigation	Notes/Discussion
Fecal Coliform	61 cfu/100 ml (2 times 31 cfu/100 ml for MF) to 100 cfu/100ml	The low end of this threshold is two times the 90th percentile standards that DMR applies for approved (open) shellfish harvesting areas and is very conservative (90% of the samples collected from the area must be above these concentrations for the harvesting area to remain open and completely unrestricted for shellfish harvesting.)
Human Bacteroides	Any concentration may be indicative of human sewage.	Any concentration of human source of sewage should be investigated.
Ammonia	≥ 0.50 mg/L	This is the effective reporting limit of the Ammonia test strips and was taken from USEPA Draft 2012 Bacteria Source Tracking Protocol.
Chlorine	≥ 0.05 mg/L	Limit of test kit and was taken from USEPA Draft 2012 Bacteria Source Tracking Protocol.
Surfactants	≥ 0.25 mg/L	Taken from USEPA Draft 2012 Bacteria Source Tracking Protocol.
Optical Brighteners	≥ 100 ug/L) (≥ 0.10 mg/L)	This is used by Maine Healthy Beaches as an actionable threshold. If using a handheld fluorometer, conduct further investigation if presence of optical brighteners is detected.

MS4s should use the thresholds listed above to make determinations whether an outfall requires additional investigation for illicit discharges. Outfalls that exceed at least one of the above thresholds should be investigated further using techniques described in the MS4s IDDE Plan.

As described in Section 2 of this QAPP, if the above thresholds are not exceeded, the MS4 may make the determination that the flow is from uncontaminated groundwater, water from a natural resource, or an allowable non-stormwater discharge.

Addenda:

1. Example Data Collection Form and labels
2. Example Chains of Custody

References:

Integrated Environmental Engineering. February 2021, *ISWG and SMSWG Stormwater Monitoring Program QAPP*, Revision 1.

U.S. EPA. September 1996, *The Volunteer Monitor's Guide to Quality Assurance Project Plans*, Document Number: 841-B-96-003.

Addendum 1

Example Field Data Collection and labels

SEE

STILLWATER ENVIRONMENTAL ENGINEERING, INC • PO Box 426, ORONO, ME 04473

MS4 Outfall Inspection Form

Outfall ID: **Date:** **Location (Lat./Long.):**

Inspector: **Time:**

Time/ Quantity of Last Precipitation (must be < .25" in preceding 72hrs):

Current Air Temperature/Weather Conditions:

Able to Inspect?

◯ Yes ◯ No (Unable to locate) ◯ No (Unable to access, fencing, etc.)

◯ No (Safety) ◯ No (Other – Describe)

Outfall Type:

◯ RCP ◯ PVC ◯ Iron ◯ CMP ◯ HDPE ◯ Ditch

◯ Other (Describe)

Outfall Diameter (If applicable): **Receiving Water:** **Flowing (Yes/No):**

Flow Quantity:

◯ Trickle ◯ Minor Flow ◯ Quarter Pipe ◯ ≥ Half Pipe
◯ N/A

Sampling Conducted:

◯ Yes ◯ No (Describe why not) ◯ N/A – No Flow

SEE

Documented Field Parameters:

Barometric Pressure_____mm/Hg Water Temperature_____°C

pH_____ Chlorine_____mg/L Ammonia_____mg/L

Conductivity_____µS/cm Dissolved Oxygen_____mg/L

Analytic Samples Collected:

◯ E. Coli ◯ Surfactants ◯ Other (Describe)

Illicit Discharge Indicators Present:

◯ Foam ◯ Discolored Discharge (Describe) ◯ Excess Algae/Vegetation

◯ Trash/Floatables ◯ Sanitary Sewer Solids ◯ Unusual Odor (Describe)

◯ Oil Sheen/Staining ◯ None ◯ Other (Describe)

General Condition of Outfall:

◯ Good ◯ Fair ◯ Poor

Identified Defects:

◯ Erosion ◯ Excess Sediment Accumulation ◯ Excess Vegetation

◯ Trash/Debris Accumulation ◯ Other (Describe) ◯ None

Maintenance Follow-Up:

◯ Yes (Describe) ◯ No

SEE

Maintenance Follow-Up Priority:

◯ High ◯ Medium ◯ Low ◯ N/A

Photo Collected:

◯ Yes ◯ No (Describe)

Comments:

This set of labels was designed to be used with Avery 5366 labels, but you can use any labels.

Sampler: _____ Date: _____
Time: _____ Field ID: _____

Sampler: _____ Date: _____
Time: _____ Field ID: _____

Addendum 2

Example Chains of Custody

Laboratory Sample Chain of Custody

Client:	Contact:	Phone #:	Email
Address:	City:	State:	Zip Code:
Purchase Order #:	Proj. Name/No.:		Quote #:
Bill (if different than above):	Address:		
Sampler (Print/Sign):			Copies To:

LAB USE ONLY Work Order #:

Remarks:

Shipping Info: FEDEX UPS CLIENT

Airbill No:

Temp C Temp Blank Intact Not Intact

*	Sample Description	Date/Time Collected	Matrix water/soil /other	No. of Containers	Analysis and Container Type Preservatives									
					Filt. Y / N	Filt. Y / N	Filt. Y / N	Filt. Y / N	Filt. Y / N	Filt. Y / N	Filt. Y / N	Filt. Y / N	Filt. Y / N	Filt. Y / N

COMMENTS:

Relinquished By:	Date/Time	Received By:	Relinquished By:	Date/Time	Received By:
Relinquished By:	Date/Time	Received By:	Relinquished By:	Date/Time	Received By:

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

EMSL ANALYTICAL, INC.
200 ROUTE 130 NORTH
CINNAMINSON, NJ 08077
PHONE: (800) 220-3675
FAX:(856) 786-0262

EMSL Order Number (*Lab Use Only*):

Company :		**EMSL-Bill to:** ☐ Same ☐ Different **If Bill to is Different please note in Comments**** *Third Party Billing requires written authorization from third party*	
Street:			
City:	**State/Province:**	**Zip/Postal Code:**	**Country:**
Report To (Name):		**Fax #:**	
Telephone #:		**E-mail Address:**	
Project Name/ Number:			
Please Provide Results: ☐ **Fax** ☐ **E-mail**	**PO#**	**State Samples Taken:**	

Turnaround Time (TAT) Options* - Please Check

☐ **3 Hour** ☐ **6 Hour** ☐ **24 Hour** ☐ **48 Hour** ☐ **72 Hour** ☐ **96 Hour** ☐ **1 Week** ☐ **2 Week**

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide. TATs are subject to methodology requirements.*

Fungi	Bacteria	Insects
☐ **ERMI Panel (M180)** *Dust Only*	☐ **Human *Bacteroides* (M199)**	☐ **Bed Bug (*Cimex lectularius*) (M146)**
☐ **EPA 36 Panel (M233)** *Air, Swab*	☐ **Total *Bacteroides* (M095)**	☐ **Tick - *Anaplasma phagocytophilum* Anaplasmosis (M261)**
☐ **Water Damage 20 Panel (M181)**	☐ ***E. coli* O157:H7 (M140)**	☐ **Tick - *Babesia microti* Babesiosis (M260)**
☐ **Wood Rot Fungi 10 Panel (M232)**	☐ ***E. coli* (M200)**	☐ **Tick - *Borrelia burgdorferi* Lyme disease (M196)**
☐ ***Aspergillus* 15 Panel (M186)**	☐ **Total *Enterococcus* (M096)**	**Other**
☐ ***Aspergillus* 6 Panel (M188)**	☐ ***Helicobacter pylori* (M207)**	☐ ***Acanthamoeba* spp. (M147)**
☐ ***Penicillium* 13 Panel (M189)**	☐ ***Legionella pneumophila* (M103)**	☐ ***Cryptosporidium* spp. (M237)**
☐ **Customized Fungi Panel (M100)**	☐ ***Legionella* 4 species-EPA (M162)**	☐ ***Giardia* spp. (M149)**
☐ ***Penicillium* Mycotoxin 9 Panel (M190)**	☐ ***Legionella* Broad Screen (M163)**	☐ **Enterovirus RT-PCR (M142)**
Birds, Animal Droppings	☐ **MRSA (M203)**	☐ **Food Authentication (F130)**
☐ ***Chlamydophila psittaci* (M234)**	☐ ***Mycobacterium avium* (M144)**	☐ **GMO Analysis (F131)**
☐ ***Cryptococcus neoformans* (M143)**	☐ ***Mycobacterium tuberculosis* (M159)**	☐ **DNA Barcode Analysis (M195)**
☐ ***Histoplasma capsulatum* (M208)**	☐ ***Pseudomonas aeruginosa***	☐ **DNA Sequencing Fungi/Bacteria Isolates (M192)**
☐ **Raccoon Roundworm (M236)**	☐ ***Salmonella* spp. (M141)**	☐ **Special Request:**
☐ **Rodent (Mouse, Rat) Dropping (M271)**	☐ ***Shigella* spp. (F122)**	

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected

Client Sample # (s): -	**Total # of Samples:**	
Relinquished (Client):	**Date:**	**Time:**
Received (Lab):	**Date:**	**Time:**
Comments:		

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

EMSL Order Number (*Lab Use Only*):

EMSL ANALYTICAL, INC.
200 ROUTE 130 NORTH
CINNAMINSON, NJ 08077
PHONE: (800) 220-3675
FAX:(856) 786-0262

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected

****Comments/Special Instructions**

Page _____ of _____ pages

Appendix G – Interlocal Contacts and Coordinated Response

This Appendix contains correspondence with adjacent and nested MS4s. The City will reach out to these communities during PY1 of the 2022 MS4 permit cycle to re-establish IDDE cooperation using the updated contact list (see below). All associated correspondence and coordinated IDDE response with neighboring communities will be documented in this Appendix.

The City of Bangor's interconnected MS4s and contacts are:

Hampden:
Victor Smith
(207) 862-3337
publicworks@hampdenmaine.gov

Orono:
Rob Yerxa
(207) 889-6101
ryerxa@orono.org

Veazie:
Mark Leonard, Town Manager
(207) 947-2781
mleonard@veazie.net

Eastern Maine Community College:
George Hanson
(207) 385-3198
ghanson@emmc.edu

Dorothea Dix Psychiatric Center:
Rick Levesque
(207) 941-4000
Rick.Levesque@maine.gov

Maine Air National Guard:
Chris Cronin
(207) 404-7407
christopher.m.cronin2.mil@mail.mil

University of Maine Augusta – Bangor Campus:
Patrick Decker
(207) 262-7734
patrick.f.decker@maine.edu

MaineDOT:
Kerem Gungor
(207) 592-3489
Kerem.Gungor@maine.gov

CITY OF BANGOR

JOHN THERIAULT PE, PTOI
CITY ENGINEER

DEPARTMENT OF ENGINEERING

March 15, 2021

Rick Levesque, Director of Facilities
Dorothea Dix Psychiatric Center
P.O. Box 926
Bangor, Maine 04402-0926

Re: Interconnected MS4 Notification and Coordination

Dear Rick,

The City of Bangor is regulated under the Maine Municipal Separate Storm Sewer System (MS4) General Permit for the discharge of stormwater from its urbanized area. Under this permit, the Town is required to coordinate with interconnected and nested MS4 permittees. With the recent reissuance of the new 5-year MS4 General Permit, which takes effect July 1st, 2022, Bangor has developed and will implement a new Stormwater Management Plan (SMP). Our Notice of Intent (NOI) to comply with the 2022 MS4 permit, accompanied by our SMP, will be filed with the Maine DEP on or before March 31st, 2021 and will also be posted on the City's website.

Because the Dorothea Dix Center's MS4 regulated area interconnects with Bangor's regulated area, we wanted to make you aware of our compliance efforts and SMP submission, as well as the continued implementation of our Illicit Discharge Detection and Elimination (IDDE) Plan that has been updated for the new permit.

Included in the IDDE Plan is an easy way for Bangor residents and staff to contact me, the Stormwater Coordinator, in the event of an illicit discharge. Should an illicit discharge occur within your facility that has the potential to discharge to Bangor's MS4, we request that you contact me immediately upon discovery of the discharge. Should an illicit discharge occur in the City of Bangor that has the potential to affect the Dorothea Dix Psychiatric Center's MS4, I will contact you immediately. Please forward this request to any of your facility's staff that might be in a position to coordinate illicit discharge response efforts.

Thank you for your cooperation in this effort to minimize the potential for illicit discharges into our MS4. Feel free to contact me with any questions.

Respectfully,

Richard May, Stormwater Utility Technician
City of Bangor Engineering Department
(207) 992-4243
richard.may@bangormaine.gov

73 HARLOW STREET, BANGOR, ME 04401
TELEPHONE: (207) 992-4250 FAX: (207) 992-4194
WWW.BANGORMAINE.GOV

CITY OF BANGOR

JOHN THERIAULT PE, PTOI
CITY ENGINEER

DEPARTMENT OF ENGINEERING

March 15, 2021

George Hanson, Facility Engineer and Stormwater Coordinator
Eastern Maine Community College
354 Hogan Road
Bangor, ME 04401

Re: Interconnected MS4 Notification and Coordination

Dear George,

The City of Bangor is regulated under the Maine Municipal Separate Storm Sewer System (MS4) General Permit for the discharge of stormwater from its urbanized area. Under this permit, the Town is required to coordinate with interconnected and nested MS4 permittees. With the recent reissuance of the new 5-year MS4 General Permit, which takes effect July 1st, 2022, Bangor has developed and will implement a new Stormwater Management Plan (SMP). Our Notice of Intent (NOI) to comply with the 2022 MS4 permit, accompanied by our SMP, will be filed with the Maine DEP on or before March 31st, 2021 and will also be posted on the City's website.

Because the EMCC MS4 regulated area interconnects with Bangor's regulated area, we wanted to make you aware of our compliance efforts and SMP submission, as well as the continued implementation of our Illicit Discharge Detection and Elimination (IDDE) Plan that has been updated for the new permit.

Included in the IDDE Plan is an easy way for Bangor residents and staff to contact me, the Stormwater Coordinator, in the event of an illicit discharge. Should an illicit discharge occur within your facility that has the potential to discharge to Bangor's MS4, we request that you contact me immediately upon discovery of the discharge. Should an illicit discharge occur in the City of Bangor that has the potential to affect EMMC's MS4, I will contact you immediately. Please forward this request to any of your facilitiy staff that might be in a position to coordinate illicit discharge response efforts.

Thank you for your cooperation in this effort to minimize the potential for illicit discharges into our MS4. Feel free to contact me with any questions.

Respectfully,

Richard May, Stormwater Utility Technician
City of Bangor Engineering Department
(207) 992-4243
richard.may@bangormaine.gov

73 HARLOW STREET, BANGOR, ME 04401
TELEPHONE: (207) 992-4250 FAX: (207) 992-4194
WWW.BANGORMAINE.GOV

CITY OF BANGOR

JOHN THERIAULT PE, PTOI
CITY ENGINEER

DEPARTMENT OF ENGINEERING

March 15, 2021

Victor Smith, Director of Public Works and Stormwater Coordinator
Town of Hampden
106 Western Ave
Hampden, ME 04444

Re: Interconnected MS4 Notification and Coordination

Dear Victor,

The City of Bangor is regulated under the Maine Municipal Separate Storm Sewer System (MS4) General Permit for the discharge of stormwater from its urbanized area. Under this permit, the Town is required to coordinate with interconnected and nested MS4 permittees. With the recent reissuance of the new 5-year MS4 General Permit, which takes effect July 1st, 2022, Bangor has developed and will implement a new Stormwater Management Plan (SMP). Our Notice of Intent (NOI) to comply with the 2022 MS4 permit, accompanied by our SMP, will be filed with the Maine DEP on or before March 31st, 2021 and will also be posted on the City's website.

Because the Town of Hampden MS4 regulated area interconnects with Bangor's regulated area, we wanted to make you aware of our compliance efforts and SMP submission, as well as the continued implementation of our Illicit Discharge Detection and Elimination (IDDE) Plan that has been updated for the new permit.

Included in the IDDE Plan is an easy way for Bangor residents and staff to contact me, the Stormwater Coordinator, in the event of an illicit discharge. Should an illicit discharge occur in your municipality that has the potential to discharge to Bangor's MS4, we request that you contact me immediately upon discovery of the discharge. Should an illicit discharge occur in the City of Bangor that has the potential to affect the Town of Hampden's MS4, I will contact you immediately. Please forward this request to any of your municipal staff that might be in a position to coordinate illicit discharge response efforts.

Thank you for your cooperation in this effort to minimize the potential for illicit discharges into our MS4. Feel free to contact me with any questions.

Respectfully,

Richard May, Stormwater Utility Technician
City of Bangor Engineering Department
(207) 992-4243
richard.may@bangormaine.gov

73 HARLOW STREET, BANGOR, ME 04401
TELEPHONE: (207) 992-4250 FAX: (207) 992-4194
WWW.BANGORMAINE.GOV

CITY OF BANGOR

JOHN THERIAULT PE, PTOI
CITY ENGINEER

DEPARTMENT OF ENGINEERING

March 15, 2021

Kerem Gungor, Ph.D., P.E
Maine DOT Environmental Office
Surface Water Quality Unit
16 SHS, Augusta, ME 04333-0016

Re: Interconnected MS4 Notification and Coordination

Dear Kerem,

The City of Bangor is regulated under the Maine Municipal Separate Storm Sewer System (MS4) General Permit for the discharge of stormwater from its urbanized area. Under this permit, the City is required to coordinate with interconnected and nested MS4 permittees. With the recent reissuance of the new 5-year MS4 General Permit, which takes effect July 1st, 2022, Bangor has developed and will implement a new Stormwater Management Plan (SMP). Our Notice of Intent (NOI) to comply with the 2022 MS4 permit, accompanied by our SMP, will be filed with the Maine DEP on or before March 31st, 2021 and will also be posted on the City's website.

Because Maine DOT's MS4 regulated area interconnects with Bangor's regulated area, we wanted to make you aware of our compliance efforts and SMP submission, as well as the continued implementation of our Illicit Discharge Detection and Elimination (IDDE) Plan that has been updated for the new permit.

Included in the IDDE Plan is an easy way for Bangor residents and staff to contact me, the Stormwater Coordinator, in the event of an illicit discharge. Should an illicit discharge occur within MDOT's infrastructure that has the potential to discharge to Bangor's MS4, we request that your agency contact me immediately upon discovery of the discharge. Should an illicit discharge occur in the City of Bangor that has the potential to affect MDOT's MS4, I will contact you immediately. Please forward this request to any of your unit staff that might be in a position to coordinate illicit discharge response efforts.

Thank you for your cooperation in this effort to minimize the potential for illicit discharges into our MS4. Feel free to contact me with any questions.

Respectfully,

Richard May, Stormwater Utility Technician
City of Bangor Engineering Department
(207) 992-4243
richard.may@bangormaine.gov

73 HARLOW STREET, BANGOR, ME 04401
TELEPHONE: (207) 992-4250 FAX: (207) 992-4194
WWW.BANGORMAINE.GOV

CITY OF BANGOR

JOHN THERIAULT PE, PTOI
CITY ENGINEER

DEPARTMENT OF ENGINEERING

March 15, 2021

Christopher Cronin, Federal Environmental Manager
Maine Air National Guard
101 Maineiac Ave
Bangor, ME 04401

Re: Interconnected MS4 Notification and Coordination

Dear Chris,

The City of Bangor is regulated under the Maine Municipal Separate Storm Sewer System (MS4) General Permit for the discharge of stormwater from its urbanized area. Under this permit, the Town is required to coordinate with interconnected and nested MS4 permittees. With the recent reissuance of the new 5-year MS4 General Permit, which takes effect July 1st, 2022, Bangor has developed and will implement a new Stormwater Management Plan (SMP). Our Notice of Intent (NOI) to comply with the 2022 MS4 permit, accompanied by our SMP, will be filed with the Maine DEP on or before March 31st, 2021 and will also be posted on the City's website.

Because the MEANG MS4 regulated area interconnects with Bangor's regulated area, we wanted to make you aware of our compliance efforts and SMP submission, as well as the continued implementation of our Illicit Discharge Detection and Elimination (IDDE) Plan that has been updated for the new permit.

Included in the IDDE Plan is an easy way for Bangor residents and staff to contact me, the Stormwater Coordinator, in the event of an illicit discharge. Should an illicit discharge occur within your facility that has the potential to discharge to Bangor's MS4, we request that you contact me immediately upon discovery of the discharge. Should an illicit discharge occur in the City of Bangor that has the potential to affect MEANG's MS4, I will contact you immediately. Please forward this request to any of your facility staff that might be in a position to coordinate illicit discharge response efforts.

Thank you for your cooperation in this effort to minimize the potential for illicit discharges into our MS4. Feel free to contact me with any questions.

Respectfully,

Richard May, Stormwater Utility Technician
City of Bangor Engineering Department
(207) 992-4243
richard.may@bangormaine.gov

73 HARLOW STREET, BANGOR, ME 04401
TELEPHONE: (207) 992-4250 FAX: (207) 992-4194
WWW.BANGORMAINE.GOV

CITY OF BANGOR

JOHN THERIAULT PE, PTOI
CITY ENGINEER

DEPARTMENT OF ENGINEERING

March 15, 2021

Rob Yerxa, Public Works Director
Town of Orono
59 Main St
Orono, ME 04473

Re: Interconnected MS4 Notification and Coordination

Dear Rob,

The City of Bangor is regulated under the Maine Municipal Separate Storm Sewer System (MS4) General Permit for the discharge of stormwater from its urbanized area. Under this permit, the Town is required to coordinate with interconnected and nested MS4 permittees. With the recent reissuance of the new 5-year MS4 General Permit, which takes effect July 1st, 2022, Bangor has developed and will implement a new Stormwater Management Plan (SMP). Our Notice of Intent (NOI) to comply with the 2022 MS4 permit, accompanied by our SMP, will be filed with the Maine DEP on or before March 31st, 2021 and will also be posted on the City's website.

Because the Town of Orono MS4 regulated area interconnects with Bangor's regulated area, we wanted to make you aware of our compliance efforts and SMP submission, as well as the continued implementation of our Illicit Discharge Detection and Elimination (IDDE) Plan that has been updated for the new permit.

Included in the IDDE Plan is an easy way for Bangor residents and staff to contact me, the Stormwater Coordinator, in the event of an illicit discharge. Should an illicit discharge occur in your municipality that has the potential to discharge to Bangor's MS4, we request that you contact me immediately upon discovery of the discharge. Should an illicit discharge occur in the City of Bangor that has the potential to affect the Town of Orono's MS4, I will contact you immediately. Please forward this request to any of your municipal staff that might be in a position to coordinate illicit discharge response efforts.

Thank you for your cooperation in this effort to minimize the potential for illicit discharges into our MS4. Feel free to contact me with any questions.

Respectfully,

Richard May, Stormwater Utility Technician
City of Bangor Engineering Department
(207) 992-4243
richard.may@bangormaine.gov

CITY OF BANGOR

JOHN THERIAULT PE, PTOE
CITY ENGINEER

March 15, 2021

Mark Leonard, Town Manager
Town of Veazie
1084 Main St
Veazie, ME 04401

Re: Interconnected MS4 Notification and Coordination

Dear Mark,

The City of Bangor is regulated under the Maine Municipal Separate Storm Sewer System (MS4) General Permit for the discharge of stormwater from its urbanized area. Under this permit, the Town is required to coordinate with interconnected and nested MS4 permittees. With the recent reissuance of the new 5-year MS4 General Permit, which takes effect July 1st, 2022, Bangor has developed and will implement a new Stormwater Management Plan (SMP). Our Notice of Intent (NOI) to comply with the 2022 MS4 permit, accompanied by our SMP, will be filed with the Maine DEP on or before March 31st, 2021 and will also be posted on the City's website.

Because the Town of Veazie MS4 regulated area interconnects with Bangor's regulated area, we wanted to make you aware of our compliance efforts and SMP submission, as well as the continued implementation of our Illicit Discharge Detection and Elimination (IDDE) Plan that has been updated for the new permit.

Included in the IDDE Plan is an easy way for Bangor residents and staff to contact me, the Stormwater Coordinator, in the event of an illicit discharge. Should an illicit discharge occur in your municipality that has the potential to discharge to Bangor's MS4, we request that you contact me immediately upon discovery of the discharge. Should an illicit discharge occur in the City of Bangor that has the potential to affect the Town of Veazie's MS4, I will contact you immediately. Please forward this request to any of your municipal staff that might be in a position to coordinate illicit discharge response efforts.

Thank you for your cooperation in this effort to minimize the potential for illicit discharges into our MS4. Feel free to contact me with any questions.

Respectfully,

Richard May, Stormwater Utility Technician
City of Bangor Engineering Department
(207) 992-4243
richard.may@bangormaine.gov

73 HARLOW STREET, BANGOR, ME 04401
TELEPHONE: (207) 992-4250 FAX: (207) 992-4194
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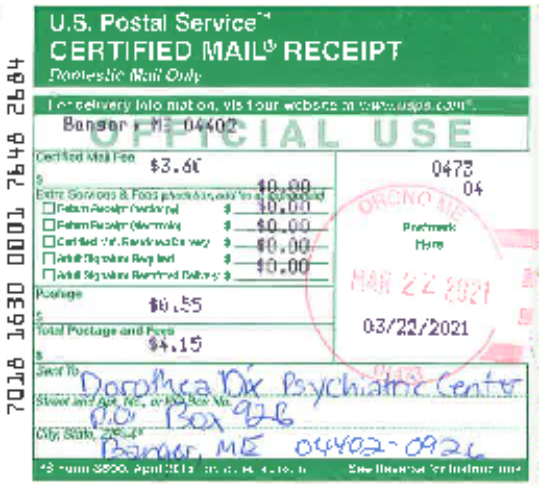
7018 1630 0001 7648 2677
Bangor, ME 04401
Certified Mail Fee $3.60
Postage $0.55
Total Postage and Fees $4.15
0473
04
Postmark Here
MAR 22 2021
03/22/2021
Sent To Eastern Maine Community College
Street and Apt. No., or PO Box No. 354 Hogan Rd
City, State, ZIP+4 Bangor, ME 04401


U.S. Postal Service
CERTIFIED MAIL® RECEIPT
Domestic Mail Only
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7018 1630 0001 7648 2684
Bangor, ME 04402
Certified Mail Fee $3.60
Postage $0.55
Total Postage and Fees $4.15
0473
04
Postmark Here
MAR 22 2021
03/22/2021
Sent To Dorothea Dix Psychiatric Center
Street and Apt. No., or PO Box No. P.O. Box 926
City, State, ZIP+4 Bangor, ME 04402-0926


U.S. Postal Service
CERTIFIED MAIL® RECEIPT
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OFFICIAL USE
7018 1630 0001 7648 2653
Certified Mail Fee $3.60
Postage $0.55
Total Postage and Fees $4.15
0473
04
Postmark Here
MAR 22 2021
03/22/2021
Sent To Maine DOT Environmental Office
Street and Apt. No., or PO Box No. 16 SHS
City, State, ZIP+4 Augusta, ME 04333-0016


U.S. Postal Service
CERTIFIED MAIL® RECEIPT
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7018 1630 0701 7648 2660
Hampden, ME 04444
Certified Mail Fee $3.60
Postage $0.55
Total Postage and Fees $4.15
0473
04
Postmark Here
MAR 22 2021
03/22/2021
Sent To Town of Hampden
Street and Apt. No., or PO Box No. 106 Western Ave
City, State, ZIP+4 Hampden, ME 04444


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CERTIFIED MAIL® RECEIPT
Domestic Mail Only
Bangor, ME 04401
OFFICIAL USE
Certified Mail Fee $3.60
Postage $0.55
Total Postage and Fees $4.15
0473
04
Postmark Here
MAR 22 2021
03/22/2021
Sent To Town of Veazie
Street and Apt. No., or PO Box No. 1084 Main St
City, State, ZIP+4® Veazie, ME 04401
7018 1830 0001 7648 2608


U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only
Orono, ME 04473
OFFICIAL USE
Certified Mail Fee $3.60
Postage $0.55
Total Postage and Fees $4.15
0473
04
Postmark Here
MAR 22 2021
03/22/2021
Sent To Town of Orono
Street and Apt. No., or PO Box No. 59 Main St
City, State, ZIP+4® Orono ME 04473
7018 1830 0001 7648 2622


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CERTIFIED MAIL® RECEIPT
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Bangor, ME 04401
OFFICIAL USE
Certified Mail Fee $3.60
Postage $0.55
Total Postage and Fees $4.15
0473
04
Postmark Here
MAR 22 2021
03/22/2021
Sent To University of Maine Augusta, Bangor Campus
Street and Apt. No., or PO Box No. 65 Texas Ave
City, State, ZIP+4® Bangor ME 04401
7018 1830 0001 7648 2615


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CERTIFIED MAIL® RECEIPT
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Bangor, ME 04401
OFFICIAL USE
Certified Mail Fee $3.60
Postage $0.55
Total Postage and Fees $4.15
0473
04
Postmark Here
MAR 22 2021
03/22/2021
Sent To Maine Air National Guard
Street and Apt. No., or PO Box No. 101 Mainiac Ave
City, State, ZIP+4® Bangor ME 04401
7018 1830 0001 7648 2646

Appendix H – IDDE Prioritization Worksheet

Drainage Area/ Subwatershed	Screening Factors -Categories of Information Reviewed																	Score	
	Poor dry weather receiving water quality		Density of Generating Sites		Density of Stormwater Infrastructure (Linear Ft pipe/ Acre)		Size of Subwatershed (Acres)		# Acres in Urbanized Area (Acres)		Average Development Age		Sewer Conversion Status		Historic Industrial Operations		Sewer Crossings/ Common trench construction (Intersection Count)		Raw Score	Average IDP Score
	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score	Notes	Score		
Arctic Brook	Impaired Stream	3	High Density	3	47.7	2	778.9	1	731.4	2	1958	2	95% converted	2	Few Industrial Operations	2	109	3	20	2.2
Birch Stream	Impaired Stream	3	High Density	3	159.1	3	1805.6	2	1543.7	3	1968	2	Built separated	1	Many Industrial Operations	3	133	3	23	2.6
Capehart Brook	Impaired Stream	3	Medium Density	2	51.6	3	687.3	1	622.7	2	1980	1	Built separated	1	Few Industrial Operations	2	89	2	17	1.9
Great Brook	Medium Quality	2	Low Density	1	0.0	1	663.6	1	0	1	1961	2	N/A	0	No Industrial Operations	1	0	1	10	1.1
Kenduskeag Stream East	Medium Quality	2	High Density	3	40.6	2	3372.6	3	1575.6	3	1940	3	Separated	2	Many Industrial Operations	3	433	3	24	2.7
Kenduskeag Stream West	Medium Quality	2	High Density	3	37.2	2	1742.6	2	1137.3	3	1928	3	Mostly combined, some separated	3	Many Industrial Operations	3	212	3	24	2.7
Osgood Brook	Medium Quality	2	Low Density	1	0.1	1	1809.5	2	597.9	2	1964	2	N/A	0	No Industrial Operations	1	0	1	12	1.3
Penjajawoc Stream	Impaired Stream	3	Medium Density	2	6.7	1	5351.6	3	1619.2	3	1988	1	Built separated	1	Few Industrial Operations	2	46	1	17	1.9
Penobscot River East	Medium Quality	2	High Density	3	94.5	3	816	1	708.9	2	1924	3	Separated	2	Many Industrial Operations	3	257	3	22	2.4
Penobscot River West	Medium Quality	2	High Density	3	43.7	2	1032.1	2	970.9	2	1918	3	Mostly combined, some separated	3	Many Industrial Operations	3	96	2	22	2.4
Shaw Brook	Impaired Stream	3	Medium Density	2	9.1	1	936.1	1	934.1	2	1975	1	Mostly built separated, some separated. No combined	2	Many Industrial Operations	3	19	1	16	1.8
Sucker Brook	Impaired Stream	3	Medium Density	2	36.3	2	1063.9	2	874	2	1960	2	Built separated	1	Many Industrial Operations	3	57	2	19	2.1
Drains to Orono	Medium Quality	2	Low Density	1	0.0	1	924	1	0	1	1998	1	N/A	0	No Industrial Operations	1	0	1	9	1.0
Drains to Hampden	Medium Quality	2	Low Density	1	10.4	2	59.5	1	48	1	1967	2	N/A	0	No Industrial Operations	1	2	1	11	1.2
Drains to Hermon	Medium Quality	2	Low Density	1	35.5	2	263.6	1	220.6	1	1934	3	N/A	0	No Industrial Operations	1	0	1	12	1.3
Drains to Glenburn	Medium Quality	2	Low Density	1	0.0	1	512.4	1	220.6	1	1980	1	N/A	0	No Industrial Operations	1	0	1	9	1.0

	Poor dry weather receiving water quality	Density of Generating Sites	Density of Stormwater Infrastructure	Size of Sub-watershed	# Acres in Urbanized Area	Average Development Age	Sewer Coversion Status	Historic Industrial Operations	Sewer Crossings/Common trench construction		
Category Definitions											
High (Score = 3)	Water is of poor quality (impaired)	High density, urban development	>50	Large	Most	Old Development that has not been redeveloped (>75 years old)	Some Combined	Many industrial operations or pollution from past operations	If a high number of crossings are present (100 or more), or many sewer lines in close proximity to stormd drain lines.		
Medium (Score = 2)	Not a high or low quality water	Medium density development	~10-50	Medium	Medium Amount	50-75 years old	Separated	Few industrial operations or all previous operations closed	If a medium number of crossings are present (50-100), or there are not a lot of sewer lines in close proximity to storm drain lines.		
Low (Score = 1)	High quality water	Low density development	<10	Small	Small Amount	Newly developed areas(<50 years old)	Built Separated	No historic industrial operations	If less than 50 crossings are present.		

C Construction Inspection Form

City of Bangor Construction Site Inspection Form		
Permit Number:	Site Contractor:	
Site Name:	Date/Time:	Inspected By:
Address/Watershed:		
Last Rain Date/Quantity:		Area Disturbed:
Reason for Inspection: ☐ Initial ☐ Routine ☐ Final ☐ Rain Event ☐ Complaint		
Project Description:		

	YES/NO/NA	COMMENTS
1. Is an Erosion and Sediment Control Plan available and being followed?		
2. Is a weekly inspection log available and up to date (if required)?		
3. Are all erosion control practices installed properly, maintained, and functioning?		
Areas at finished grade are properly stabilized		
Concentrated flow inlet/outlet protection installed		
Disturbed dormant areas stabilized		
Entrance/exits properly stabilized		
Slopes and stockpiles properly stabilized/protected		
Other		

	YES/NO/NA	COMMENTS
4. Are all sedimentation control practices installed properly, maintained, and functioning?		
Construction entrance		
Dust control practices		
Sedimentation basins/traps/diversions		
Perimeter controls		
Check dams		
Other		
5. Are ESC measures, construction activities, and housekeeping adequately maintained?		
Sedimentation/erosion in ditches		
Tracked sediment or dust at exits		
Hazardous material storage and spill control practices adequate		
Waste management (concrete/paint washout, solid waste, sanitary waste, hazardous waste, etc.) adequate		
Other		

	YES/NO/NA	COMMENTS
6. Violation, Corrective Actions, Recommendations		
Sediment/pollutants discharged from site		
Natural resource impacts		
Corrective action required		
Site compliant with all permits		
Notice of violation or stop work order issued		
Comments/Corrective Actions (complete corrective actions before the next rain event and within 7 days)		

Attach any photos taken at the time of inspection to this document.

D Catch Basin Inspection Form

SEE

STILLWATER ENVIRONMENTAL ENGINEERING, INC • PO Box 426, ORONO, ME 04473

MS4 Catch Basin Inspection Form

Catch basin ID: **Date:** **Location (Lat./Long.):**

Inspector: **Time:**

Able To Inspect?

◯ Yes ◯ No (Unable to locate) ◯ No (Unable to access, fencing, etc.)

◯ No (Safety) ◯ No (Other – Describe)

Condition

◯ Good ◯ Fair ◯ Poor

Defects

◯ Loose Bricks ◯ Cracked Grout ◯ Frame Cracked ◯ Erosion

◯ Pavement Cracked ◯ Severe Structural Cracks ◯ Other (Describe)

◯ None

Sump Depth (Feet): **Silt Depth (Feet):** **≥50% of Sump Depth? (Yes/No):**

Flow Description:

◯ None ◯ Trickle ◯ Moderate ◯ Significant ◯ Intermittent

◯ Flooded ◯ Other (Describe)

Water Condition

◯ Clear ◯ Murky ◯ Litter ◯ Odor (Describe)

◯ Vegetation (Describe) ◯ Oil Sheen

◯ Pet Waste ◯ Foam ◯ Sanitary Sewer Solids

◯ Other (Describe)

SEE

Follow-Up:

◯ Yes (Describe) ◯ No

Follow-Up Priority:

◯ High ◯ Medium ◯ Low ◯ N/A

Photo Collected:

◯ Yes ◯ No (Describe)

Comments:

E 2022 MS4 General Permit

An electronic version of the 2022 MS4 General Permit can be found at the below link. This permit is also available in the City's electronic data management system.

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

F Notice of Intent

NOTICE OF INTENT TO COMPLY WITH MAINE GENERAL PERMIT FOR THE DISCHARGE OF STORMWATER FROM MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4)

PLEASE TYPE OR PRINT IN *BLACK INK ONLY*

PERMITTEE INFORMATION					
MS4 Entity	City of Bangor			Permittee ID #	MER041026
Name and title of chief elected official or principal executive officer	Cathy Conlow, City Manager				
Mailing Address	73 Harlow St				
Town/City	Bangor	State	ME	Zip Code	04401
Daytime Phone	(207) 992-4205	Email	city.manager@bangormaine.gov		
PRIMARY CONTACT PERSON FOR OVERALL STORMWATER MANAGEMENT PROGRAM (if different than PEO/CEO)					
Name and Title	Richard May				
Mailing Address	73 Harlow St				
Town/City	Bangor	State	ME	Zip Code	04401
Daytime Phone	(207) 992-4243	Email	richard.may@bangormaine.gov		
STORMWATER MANAGEMENT PLAN (SWMP)					
Urbanized Area (sq. mi.)	18.5				

I have attached our updated SWMP with ordinances, SOPs, forms. ☐

Name of streams, wetlands, or waterbodies to which the regulated small MS4 discharges (*attach additional sheets as necessary*):

Arctic Brook, Birch Stream, Capehart Brook, Cemetary Brook, Kenduskeag Stream, Meadow Brook, Penjajawoc Stream, Penobscot River, Shaw Brook, Sucker Brook, Woodlawn Brook

List of impaired waterbodies that receive stormwater from the regulated small MS4 (*attach additional sheets as necessary*):

Arctic Brook, Birch Stream, Capehart Brook, Kenduskeag Stream (Non-UIS), Penjajawoc Stream (Including Meadow Brook), Penobscot River(Non-UIS), Shaw Brook, Sucker Brook

CERTIFICATION

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

Signature of Permittee	Cathy M Conlow	Date	3-26-2021

This NOI registration form must be filed with the Department at the following address:

Stormwater Program Manager
Maine Department of Environmental Protection
Bureau of Water Quality
17 State House Station
Augusta ME 04333-0017
Rhonda.Poirier@maine.gov

OFFICE USE ONLY							
Date Recieved		Staff		Date Accepted		Date Not Accepted	

F.1 Newspaper Public Notice

Legal Notices

NOTICE OF INTENT (NOI)

The Municipality of Bangor will file a Notice of Intent (NOI) to comply with the Maine General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems issued 10/15/2020 (MER041000 W009170-5Y-C-R) and an associated Stormwater Management Plan (SWMP) with the Maine Department of Environmental Protection. The NOI and SWMP will be filed on or about **March 31, 2021**. A copy may also be seen at the Bangor municipal offices and on the municipal website: URL: https://www.bangormaine.gov/.

The DEP will review the submittal and assess if it is complete for processing within 60 days of submittal. Once it has been deemed complete for processing, it will be made available on the Maine DEP website for 30-day public comment: https://www.maine.gov/dep/comment/index.html. A request for public hearing or request that the Board of Environmental Protection assume jurisdiction over this application must be received by the DEP, in writing, no later than 20 days after the application is found acceptable for processing. Requests must indicate the interest of the person filing the request and specify the reasons why a hearing is warranted. Unless otherwise provided by law, a hearing is discretionary and may be held if the Commissioner or the Board finds significant public interest or there is conflicting technical information.

The NOI and SWMP are also available for viewing at the DEP Office in Augusta by scheduled appointment during normal business hours during the pandemic. Written public comments or requests for information may be made to the Division of Water Quality Management, Department of Environmental Protection, State House Station #17, Augusta, ME 04333- 0017; telephone (207) 592-6233 and must include the name of the municipality filing the NOI and the Permit number provided above.

March 20, 2021