



HALEY WARD

ENGINEERING | ENVIRONMENTAL | SURVEYING

STORMWATER MANAGEMENT PLAN

FOR

UNIVERSITY OF MAINE AT AUGUSTA
BANGOR CAMPUS

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SECTION 1 | INTRODUCTION

1.1 Overview of Regulatory Program

The General Permit for the Discharge of Stormwater from Small State and Federally Owned Municipal Separate Storm Sewer Systems (General Permit; **Appendix C**) was issued by the Maine Department of Environmental Protection (MDEP) on December 8, 2021.¹ The General Permit was issued pursuant to 38 M.R.S.A. § 413 and authorizes the direct discharge of stormwater from, or associated with, a regulated small State or Federally owned municipal separate storm sewer system (MS4) to waters of the State other than groundwater. Such discharges must meet the requirements of the General Permit, permittee specific MDEP Orders, and applicable provisions of Maine waste discharge and water classification statutes and rules.

1.1.1 Stormwater Management Plan

The General Permit requires regulated MS4s to develop, implement, and enforce a Stormwater Management Plan (Plan) that puts into practice the six minimum control measures (MCMs) set forth in Part IV, Section C of the General Permit (**Section 4**). Each MCM is designed to reduce the discharge of pollutants within the urbanized area (UA) of a regulated small State or Federally owned MS4 to the maximum extent practicable, such as to protect water quality. For each MCM, the Plan must define specific best management practices (BMPs), designate responsibility for each BMP, define a timeline for implementation of each BMP, and define measurable goals for each BMP. The Plan must be updated within 60 days of permit authorization to include how the permittee will meet all requirements of the MDEP Order for the MS4.

The Plan and all minimum MCMs, as defined in **Section 4**, must be implemented by the effective date of the General Permit. The General Permit becomes effective October 1, 2022.

1.1.2 Sharing Responsibility

The General Permit requires regulated MS4s to identify interconnections within the MS4 and find ways to cooperate with any such other regulated or non-regulated entities. Where a portion of the separate storm sewer system within a regulated MS4 is owned, operated, or otherwise the responsibility of another regulated small MS4, the regulated MS4 must provide a clear description of respective responsibilities and must be included in the Plan. If the regulated MS4 relies on a third party to implement one or more BMPs, the regulated MS4 shall note that fact in its Plan and Annual Compliance Report (**Section 1.1.3**). If the third party fails to implement the measure, the regulated MS4 remains responsible for its implementation.

1.1.3 Record Keeping and Annual Reporting

The regulated MS4 shall keep records required by the General Permit for at least five years from the date that the record is generated, at least three years following the expiration

¹On January 12, 2001, the MDEP received authorization to administer the Federal National Pollutant Discharge Elimination System (NPDES) program within the State of Maine. The NPDES program was created by the Clean Water Act in 1972 to improve water quality by regulating point source discharges into waters of the United States. The MDEP implements the NPDES program through the Maine Pollutant Discharge Elimination System (MEPDES) program. The General Permit is part of the MEPDES program.



of the General Permit, and/or longer if requested by the MDEP or Environmental Protection Agency (EPA).

By September 15 of each year, the regulated MS4 must electronically submit an Annual Compliance Report (Report) to the MDEP for review and approval.²

MS4 Program Manager
Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017
E-mail: Holliday.Keen@maine.gov

The Report must include the following:

1. The status of compliance with the terms and conditions of the General Permit and MS4 specific MDEP Order based on the implementation of the Plan, an assessment of the effectiveness of the components of the stormwater management program, an assessment of the appropriateness of identified BMPs, progress toward achieving identified measurable goals for each MCM, and progress toward achieving the goal of reducing the discharge of pollutants from the MS4.
2. A summary of information collected and analyzed, including monitoring data, if any, during the reporting period.
3. A summary of the stormwater activities the permittee intends to undertake pursuant to its Plan to comply with the terms and conditions of the General Permit and permittee specific MDEP Order during the subsequent reporting cycle.
4. A change in any identified BMPs or measurable goals that apply to the Plan.
5. A summary describing the activities, progress, and accomplishments for each MCM, including such items as the status of education and outreach efforts, public involvement activities, stormwater mapping efforts, the number of visual dry weather inspections performed, the number of inaccessible and new outfalls, dry weather flow sampling events and laboratory results, detected illicit discharges, detected illicit connections, illicit discharges that were eliminated, any sanitary sewer overflows, construction site inspections, number and nature of enforcement actions, post-construction BMP status and inspections, the number of functioning post-construction BMPs, the number of post-construction sites requiring maintenance or remedial action, the status of the MS4 good housekeeping/pollution prevention program including the percentage of catch basins cleaned, those catch basins cleaned multiple times, and the number of catch basins that could not be evaluated for structural condition in a safe manner, etc. Where applicable, the MS4 must quantify steps, measures, and activities taken to comply with the General Permit and its Plan including reporting on the types of trainings presented, the number of municipal and contract staff that received training, the length of the training and the training content delivered as well as any revisions to the SWPPP procedures, as relevant, and/or changes in municipal operations.

² Standardized Annual Compliance Report forms will be provided by the MDEP or the regulated MS4 may submit an alternative form to the MDEP for review and approval.



Changes to the report based on MDEP review comments must be submitted to the MDEP within 60 days of the receipt of the comments.

1.2 Plan Availability

The regulated MS4 must maintain a signed copy of its Stormwater Management Plan at its State office and on its official State webpage. The regulated MS4 will make records, including its Plan, available to the EPA, operator of any identified interconnected MS4s, downstream public water supply companies, and the public during regular business hours.

1.3 Keeping Plans Current

The regulated MS4 must maintain its Stormwater Management Plan as current and amend it if actions required by BMPs fail to control pollutants to meet the terms and conditions of the General Permit and permittee specific MDEP Order, the BMPs do not prevent the potential for a significant contribution of pollutants to waters of the State other than groundwater, and/or new information results in a shift in the Plan priorities. The public will be provided with the opportunity to comment on any changes made to the Plan a minimum of once per year.

SECTION 2 | REGULATED MS4 INFORMATION

2.1 Municipality Background

The University of Maine Augusta, Bangor Campus (UMAB; facility), is located in Bangor, Maine. The facility is situated on approximately 57 acres. The total enrollment at UMAB is approximately 760 students, and there are approximately 66 full-time staff.

2.2 Location Map

A Location Map for the facility is included in **Appendix A**. The facility is located within the urbanized area (UA) of the City of Bangor.

A portion of the facility's property drains toward the City of Bangor's storm sewer system for runoff collection in the Birch Stream Watershed; Birch Stream has been identified by the State of Maine as impaired. UMAB does not discharge by point source directly to Birch Stream. General Permit Part IV (E) does not apply to UMAB.

SECTION 3 | PLANNING AND ORGANIZATION

3.1 Plan Management

The development and implementation of this Stormwater Management Plan is the responsibility of the following individual.

- James Kauppila – Director of Facilities Management

3.2 Regional Collaboration

UMAB is a member of the Bangor Area Stormwater Group (BASWG). The BASWG is a nonprofit organization consisting of regulated MS4s including municipalities and State or Federally owned facilities in the greater Bangor UA. According to BASWG bylaws, “[t]he purpose of the group is to use public education and sound science to improve regional water quality through collaborative stormwater management.” The regulated



municipalities and facilities in the greater Bangor UA utilize this collaborative approach to facilitate compliance with MCM 1 education and outreach requirements, and MCM 2 public involvement and participation requirements of the General Permit. Every permit cycle, the BASWG develops a SWMP based on the MS4 permit that addresses how the regional collaborative group will comply with these MCMs.

3.3 MS4 Interconnections

Portions of the facility's separate storm sewer system discharge to the City of Bangor's MS4. The City of Bangor as a regulated MS4 is responsible for the development and implementation of a Stormwater Management Plan. If an illicit discharge is detected from an outfall near an interface between two of the storm sewer systems, the two entities responsible for each storm sewer system will coordinate their efforts to detect and eliminate the cause of the illicit discharge.

SECTION 4 | MINIMUM CONTROL MEASURES

The following six MCMs are based on the requirements set forth in Part IV.C. of the MDEP MS4 General Permit. For each MCM, BMPs are defined, responsible parties for BMP implementation are listed, and measurable goals and timelines for implementation are discussed. The six MCMs required by the General Permit and addressed in this plan include:

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

4.1 MCM 1: Education/Outreach Program

In accordance with the General Permit, the regulated MS4 must develop and implement an ongoing education/outreach program that addresses the stormwater discharges and the impacts thereof on waterbodies, identifies steps that can be taken to reduce pollutants in stormwater runoff, and is designed to address stormwater issues of significance. The ultimate objective of the program is to change the behavior of target audiences so that pollutants in stormwater are reduced.

The program is required to:

- Be defined in the SWMP and implemented over the term of the General Permit.
- Define target audiences, specific messages, message delivery/distribution tools, evaluation methods, and an implementation schedule for each target audience.
- Define the awareness and behavior change goals and identify the party or parties responsible for program implementation.



- Identify methods to evaluate the effectiveness of each awareness and behavior change campaign.³

The regulated MS4 may partner with other MS4s, community groups, or watershed associations to implement the Education/Outreach Program, which is required to minimally include:

- An Outreach to Raise Awareness Campaign⁴ of stormwater pollution issues targeted at the permittee's community members and/or if the permittee participates as a member in the local stormwater working group, then participation in the group's campaign. This campaign must implement a minimum of one awareness campaign during the permit term. The campaign must be delivered using a minimum of three outreach tools per year.
- An Outreach to Change Behavior Campaign⁵ to reduce pollutants in stormwater. This campaign is required to promote a minimum of one behavior change per permit term, be directed at one audience annually, and use a minimum of three different outreach tools per year.

UMAB will develop and/or collaborate with the BASWG to develop the necessary outreach campaign plans required by this MCM. These plans include the following:

- General Public Awareness Plan (**BMP 1A**)
- Chloride Behavior Change Plan (**BMP 1B**)

The MCM 1 Education/Outreach Programs will be implemented as detailed below.

BMP 1A Implement an Outreach to Raise Awareness Campaign

UMAB will collaborate with the BASWG to continue outreach efforts from previous permit cycles. According to the BASWG Stormwater Management Plan, the BASWG will develop a General Awareness Plan to raise public awareness of stormwater issues in accordance with Part IV (C)(1) of the General Permit. The General Awareness Plan will implement the awareness campaign required per permit term and be implemented using a minimum of three outreach tools per year. A copy of the BASWG's Regional Stormwater Management Plan detailing their General Awareness Plan is included in **Appendix D**.

Measurable Goals

1. The BASWG submitted the General Awareness Plan to the MDEP for review and approval on or before March 31, 2021.
2. Starting with the effective date of the General Permit, or as otherwise communicated by the MDEP, the BASWG will begin implementation of the approved General Awareness Plan.

³ Any message or delivery mechanism found to be ineffective or of unsatisfactory efficacy must be modified accordingly.

⁴ Outreach to raise awareness means to introduce information that may be new to or not well understood by the target audience.

⁵ Outreach to Change Behavior means to promote and reinforce desirable behaviors designed to reduce storm water pollution.



3. Prior to the onset of the campaign in Permit Year (PY) 1, or as otherwise communicated by the MDEP, the BASWG will conduct a baseline evaluation that is relevant and appropriate to the campaign objectives.
4. In PY5, the BASWG will conduct an evaluation to assess the overall effectiveness of the outreach program.
5. In each Annual Report (**Section 1.1.3**), the BASWG will provide General Awareness Campaign messages, the methods of campaign distribution, the outreach tools used, the measures/methods used to determine the on-going effectiveness of the campaign, and any changes planned based on the measures of effectiveness.

Responsible Parties

BASWG – Executive Committee

UMAB – James Kauppila, Director of Facilities Management

BMP 1B Implement an Outreach to Change Behavior Campaign

UMAB will collaborate with the BASWG to continue outreach efforts from previous permit cycles. According to the BASWG Stormwater Management Plan, the BASWG will develop a Chloride Behavior Change Plan to change behaviors regarding the use of sodium chloride in accordance with Part IV (C)(1) of the General Permit. The Chloride Behavior Change Plan will implement the required behavior change campaign required per permit term to a minimum of one audience, using a minimum of three outreach tools per year. A copy of the BASWG's Regional Stormwater Management Plan including their Chloride Behavior Change Plan is included in **Appendix D**.

Measurable Goals

1. The BASWG submitted the Chloride Behavior Change Plan to the MDEP for review and approval on or before March 31, 2021.
2. Starting with the effective date of the General Permit, or as otherwise communicated by the MDEP, the BASWG will begin implementation of the approved Chloride Behavior Change Plan.
3. Prior to the onset of the campaign in PY1, or as otherwise communicated by the MDEP, the BASWG will conduct a baseline evaluation that is relevant and appropriate to the campaign objectives.
4. In PY5, the BASWG will conduct an evaluation to assess the overall effectiveness of the outreach program.
5. In each Annual Report (**Section 1.1.3**), the BASWG will provide Chloride Behavior Change Campaign messages, the methods of campaign distribution, the outreach tools used, the measures/methods used to determine the on-going effectiveness of the campaign, and any changes planned based on the measures of effectiveness.

Responsible Parties

BASWG – Executive Committee

UMAB – James Kauppila, Director of Facilities Management

4.2 MCM 2: Public Involvement and Participation

In accordance with the General Permit, regulated MS4 must involve the facility's community in both the planning and implementation process of improving water quality and reducing stormwater quantity. This will enable the regulated MS4 to benefit from



valuable additional input, expertise, and assistance, and increase community support through active engagement. The regulated MS4 is specifically required to:

- Comply with applicable State and local public notice requirements using effective mechanisms and comply with the public notice requirements of the Maine Freedom of Access Act, 1 M.R.S. §§ 401 et seq. (FOAA) when the permittee involves stakeholders in the implementation of this General Permit. All related public meetings and attendance must be documented in the Annual Report (**Section 1.1.3**).
- Annually host, conduct, or participate in a public event. The event must include a pollution prevention and/or water quality theme. The target audience does not need to be the entire facility or urbanized area but should be aimed at a segment of the facility or population that the permittee wishes to reach.

The MCM 2 Public Involvement and Participation requirements will be implemented as detailed below.

BMP 2A Public Notice

In accordance with Part IV (C)(2) of the General Permit, UMAB will comply with State and local public notice requirements when it involves stakeholders in the implementation of the General Permit. According to the BASWG Stormwater Management Plan, the BASWG will post meeting notices and agendas as well as opportunities for stakeholder involvement. BASWG meetings are open to the public, and interested stakeholders are encouraged to participate.

Measurable Goals

1. UMAB will comply with State and local public notice requirements.
2. The BASWG will post monthly meeting notices and agendas on the BASWG website.
3. The BASWG will document meeting attendance and record minutes of each meeting.
4. The BASWG will document all annual meetings and attendance in each Annual Report (**Section 1.1.3**).

Responsible Parties

BASWG – Executive Committee

UMAB – James Kauppila, Director of Facilities Management

BMP 2B Public Event

In accordance with the requirements of Part IV (C)(2) of the General Permit, UMAB will collaborate with the BASWG on an annual public event. According to the BASWG Stormwater Management Plan, the BASWG will annually host, conduct, or participate in a public event, such as a garden show or stream clean up.

Measurable Goals

1. The BASWG will host, conduct, or participate in at least one public event each year.
2. The BASWG will provide a list of the annual event(s) hosted, conducted, and/or attended in each Annual Report (**Section 1.1.3**).



Responsible Parties

BASWG – Executive Committee

UMAB – James Kauppila, Director of Facilities Management

4.3 MCM 3: Illicit Discharge Detection and Elimination

In accordance with the General Permit, the regulated MS4 must implement and enforce a program to detect and eliminate illicit discharges and non-stormwater discharges, unless otherwise authorized under Part IV (C)(3)(h) of the General Permit. The program must address procedures for prioritizing watersheds, procedures for tracing the source of an illicit discharge, procedures for removing the source of the discharges, and procedures for program evaluation and assessment.

The regulated MS4 must specifically:

- Implement a non-stormwater discharge regulatory mechanism that prohibits the discharge of non-stormwater discharges and provides for implementation of enforcement procedures and actions.⁶
- Establish a written Illicit Discharge Detection and Elimination (IDDE) Plan that meets the requirements of Part IV (C)(3)(b).
- Maintain, keep current, and annually review for updates a map of their State and/or federally owned or operated storm sewer systems.
- Implement a dry weather outfall inspection program that meets the requirements of Part IV (C)(3)(e).
- Perform a wet weather assessment for the potential for illicit discharges during wet weather events prior to the expiration date of the General Permit.
- Summarize any Sanitary Sewer Overflow (SSO) events that discharge to the MS4 in annual reports.

The MCM 3 IDDE requirements will be implemented as detailed below.

BMP 3A Non-Stormwater Discharge Written Policy/Procedure

In accordance with the requirements of Part IV (C)(3)(a) of the General Permit, UMAB will develop a non-stormwater discharge policy (**Appendix E**). This will ensure that written policy exists to prohibit non-stormwater discharges into the UMAB storm sewer system. Potential violations of this policy will be investigated and handled in accordance with the written IDDE Plan (**BMP 3B**) and subject to the City of Bangor non-stormwater discharge ordinance.

Measurable Goal

1. UMAB submitted the non-stormwater discharge policy to the MDEP for review and approval on or before March 1, 2022.
2. Pending approval by MDEP, UMAB will implement the approved non-stormwater discharge policy.
3. Pending approval by MDEP, UMAB will include a copy of the non-stormwater discharge policy to contractors when distributing construction contract documents.

⁶ MS4s without the authority to enact a regulatory mechanism shall ensure that written policies or procedures are in place to address this requirement



Responsible Party

UMAB – James Kauppila, Director of Facilities Management

BMP 3B Written Illicit Discharge Detection and Elimination Plan

In accordance with Part IV (C)(3)(b) of the General Permit, UMAB will develop a written IDDE Plan, which addresses discharges that are not uncontaminated groundwater, water from a natural resource, or an allowable non-stormwater discharge (**Appendix F**). The written IDDE Plan is consistent with Part IV (C)(3)(b)(i) through (vi) of the General Permit.

Measurable Goals.

1. UMAB submitted the written IDDE Plan to the MDEP for review and approval on or before March 1, 2022.
2. Starting with the effective date of the General Permit, or as otherwise communicated by the MDEP, UMAB will implement the approved IDDE Plan.
3. If elimination of an illicit discharge within 60 calendar days of its identification and verification as an illicit discharge is not possible, UMAB will establish an expeditious schedule for its elimination and report the dates of identification and schedules for removal in the Annual Report (**Section 1.1.3**).

Responsible Party

UMAB – James Kauppila, Director of Facilities Management

BMP 3C Sewer System Map

In accordance with Part IV (C)(3)(d) of the General Permit, UMAB will continue to rely on storm sewer system infrastructure maps developed during a previous permit cycle. The storm sewer system infrastructure maps depict the following:

- Location and a unique identifier for all stormwater catch basins;
- Location of connecting surface and subsurface infrastructure;
- Direction of inflow and outflow pipes;
- Location of all discharges from all stormwater outfalls operated by the MS4 to receiving waters or to an interconnected MS4; and
- Description of outfall including type, material, size of conveyance, and name of the receiving water.

Measurable Goal

During each permit year, UMAB will continue to maintain its existing storm sewer infrastructure maps that were developed as a part of a previous permit cycle, revise these maps as changes occur within the system, and review these maps for updates.

Responsible Party

UMAB – James Kauppila, Director of Facilities Management

BMP 3D Dry Weather Outfall Inspection Program

In accordance with Part IV (C)(3)(e) of the General Permit, UMAB will continue to implement dry weather outfall inspections to detect illicit discharges to the storm sewer system. The dry weather outfall inspection program is documented in the written IDDE Plan (**Appendix F**).



Measurable Goals

1. UMAB submitted the written IDDE Plan to the MDEP for review and approval on or before March 1, 2022. The IDDE Plan includes a written dry weather outfall inspection program in accordance with Part IV (C)(3)(e)(i. – viii.).
2. During each permit year, UMAB will continue to implement its dry weather outfall inspection program that was developed as a part of a previous permit cycle. UMAB will revise program documents as any changes occur within the storm sewer system and as necessary to maintain compliance with Part IV (C)(3)(e) of the General Permit.
3. By the end of PY5, 100% of the outfalls within the UA will have been inspected.

Responsible Party

UMAB – James Kauppila, Director of Facilities Management

BMP 3E Wet Weather Assessment

In accordance with Part IV (C)(3)(f) of the General Permit, UMAB will perform a wet weather assessment prior to the expiration date of the General Permit to identify outfalls with the potential for illicit discharges during wet weather events. The outcome of the assessment will be a list of outfalls identified for wet weather monitoring and testing if applicable, by UMAB in the next permit cycle and the rationale for including these outfalls.

Measurable Goals

1. In PY1, UMAB will develop criteria to evaluate the potential for illicit discharges during wet weather events.
2. In PY2 and PY3, UMAB will use the criteria established in PY1 to identify outfalls and/or discharges that may require wet weather evaluation for potential illicit discharges.
3. In PY4, UMAB will establish a draft list of outfalls identified for wet weather monitoring and testing in the subsequent permit cycle and the rationale for including these outfalls.
4. In PY5, UMAB will finalize the list of outfalls identified for wet weather monitoring and testing in the subsequent permit cycle and the rationale for including these outfalls. UMAB will revise its written IDDE Plan to include the list of outfalls identified, identify the outfalls targeted for wet weather monitoring based on the EPA New England bacterial source tracking protocol or other acceptable protocols, and specify the timing and frequency of wet weather monitoring to be completed during the term of the next permit cycle.

Responsible Party

UMAB – James Kauppila, Director of Facilities Management

4.4 MCM 4: Construction Site Stormwater Runoff Control

In accordance with the General Permit, the regulated MS4 must implement and enforce a program to minimize or eliminate pollutants in any stormwater runoff to the regulated small MS4 from construction activities that result in a land disturbance greater than or equal to one acre. 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 or more acre.

The program must include:

- An ordinance or other regulatory mechanism that requires the use of erosion and sediment control BMPs at construction sites consistent with the minimum standards outlined in Appendix C, “Erosion and Sedimentation Control, Inspections and Maintenance and Housekeeping” of the General Permit.
- 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.
- Procedures for notifying construction site developers and operators of the requirements for registration under the Maine Construction General Permit (MCGP) and Chapter 500, Stormwater Management.
- Procedures for construction site operations to control waste such as discarded building materials, concrete truck washouts, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality.
- Documentation of construction activity that disturbs one or more acre within the urbanized area including written procedures for site inspections and enforcement of erosion and sedimentation control measures.

The MCM 4 Construction Site Stormwater Runoff Control requirements will be implemented as detailed below.

BMP 4A Ordinance/Regulatory Mechanism

In accordance with Part IV (C)(4) of the General Permit, UMAB will continue to rely on its existing construction contract documents developed during a previous permit cycle to require the use of erosion and sedimentation controls at construction sites. UMAB will also continue to rely on MDEP administration and enforcement of the Maine Construction General Permit (MCGP) and Chapter 500, Stormwater Management.

Measurable Goals

1. By the end of PY1, UMAB will review and update as needed, its existing construction contract documents to ensure compliance with Part IV (C)(4) of the General Permit.
2. If existing regulatory mechanisms are found to require updating, by the end of PY2, UMAB will have an approved regulatory mechanism in place with the necessary enforcement authority.

Responsible Party

UMAB – James Kauppila, Director of Facilities Management

BMP 4B Procedures for Site Plan Review

UMAB is located within the City of Bangor and, therefore, is subject to its site plan review process. In accordance with Part IV (C)(4) of the General Permit, UMAB will continue to be subject to, as applicable, the City’s procedures for site plan review that incorporate consideration of potential water quality impacts, erosion control, waste storage, 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.

Measurable Goal

During each permit year, UMAB will be subject to City of Bangor's site plan review process.

Responsible Party

UMAB – James Kauppila, Director of Facilities Management

BMP 4C Procedures for Notifying of Stormwater Requirements

In accordance with Part IV (C)(4)(a) of the General Permit, UMAB will continue to rely on City of Bangor procedures for notifying developers of stormwater requirements, the MDEP, and existing construction contract documents developed during a previous permit cycle, to ensure that requirements for registration under the MCGP or Chapter 500, Stormwater Management are met.

Measurable Goals

1. By the end of PY1, UMAB will review its construction contract documents to ensure that they contain notification of stormwater requirements.
2. During each permit year, UMAB will continue to rely on City of Bangor procedures for notifying developers of stormwater requirements, the MDEP, to ensure that the requirements for registration under the MCGP or Chapter 500, Stormwater Management are met.

Responsible Party

UMAB – James Kauppila, Director of Facilities Management

BMP 4D Construction Waste Control

In accordance with Part IV (C)(4)(a) of the General Permit, UMAB will continue to rely on its existing construction contract documents developed during a previous permit cycle and City of Bangor requirements to require construction site operations to control waste such as discarded building materials, concrete truck washouts, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality.

Measurable Goal

1. By the end of PY1, UMAB will review its construction contract documents to ensure that they require construction site operations to control waste.
2. During each permit year, UMAB will continue to rely on City of Bangor requirements to require construction site operations to control waste.

Responsible Party

UMAB – James Kauppila, Director of Facilities Management

BMP 4E Construction Activity Documentation

In accordance with Part IV (C)(4) of the General Permit, UMAB will continue to document every construction activity that disturbs one or more acre within the urbanized area. Such



documentation may include project status, inspection findings, size of project, estimated date of project completion, and proximity to waterbodies.

Measurable Goals

1. During each permit year, UMAB will continue to rely on its existing database to track all construction activity that disturbs one or more acres at the facility.
2. UMAB is subject to City of Bangor requirements for conducting and documenting site inspections. Compliance with City of Bangor requirements will address Part IV (C)(4)(a)(v)(b)(i. – iv.) requirements.

Responsible Party

UMAB – James Kauppila, Director of Facilities Management

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

In accordance with the General Permit, the regulated MS4 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. Including:

- Promoting strategies that include a combination of structural and/or nonstructural BMPs appropriate to prevent or minimize water quality impacts.
- On or before December 31, 2022, developing and implementing an enforceable program for stormwater management on new and redevelopment sites that establishes performance standards for LID techniques.
- Implementing post-construction discharge ordinance or other regulatory mechanism to provide for adequate long-term operation and maintenance of post-construction BMPs.

The MCM 5 Post-Construction Stormwater Management in New Development and Redevelopment requirements will be implemented as detailed below.

BMP 5A Post-Construction Stormwater Management in New Development and Redevelopment

In accordance with Part IV (C)(5)(a) of the General Permit, UMAB will continue to rely on its existing procedures developed during a previous permit cycle to promote strategies including a combination of structural and/or non-structural BMPs appropriate to manage water quality impacts. UMAB will also continue to rely on MDEP for oversight, administration, and enforcement of the MCGP and Chapter 500, Stormwater Management.

Measurable Goal

UMAB is subject to the City of Bangor's post-construction stormwater ordinance and procedures. These measures require UMAB to comply with post-construction stormwater runoff requirements, as well as be aware of and implement, as appropriate, various stormwater BMP strategies, including those that are low impact.

UMAB – James Kauppila, Director of Facilities Management



BMP 5B Low Impact Development Ordinance

In accordance with Part IV (C)(5)(a), of the General Permit, UMAB will be subject to the City of Bangor's Low Impact Development (LID) ordinance, which is under development pursuant to the City's MS4 Permit requirements. UMAB will include LID performance standards with its construction contract documents.

Measurable Goals

1. UMAB will be subject to the City of Bangor's Low Impact Development ordinance, which is under development and expected to be implemented in accordance with the City's MS4 Permit requirements.
2. On or before November 30, 2022, UMAB will develop LID performance standards in accordance with the General Permit and submit those to MDEP for review and approval.
3. On or before December 31, 2022, UMAB will begin implementation of LID performance standards at the facility. LID performance standards will be included with facility construction contract documents for qualifying projects.

UMAB – James Kauppila, Director of Facilities Management

BMP 5C Regulatory Mechanism

In accordance with Part IV (C)(5)(b), of the General Permit, UMAB is subject to the City of Bangor's post-construction stormwater ordinance and procedures, which ensure adequate long-term operation and maintenance of post-construction BMPs. UMAB is also subject to MDEP administration and enforcement of the MCGP and Chapter 500, Stormwater Management.

Measurable Goal

UMAB is subject to the City of Bangor's post-construction stormwater ordinance and procedures. These measures require annual post-construction inspections by a qualified third-party inspector.

UMAB – James Kauppila, Director of Facilities Management

4.6 MCM 6: Pollution Prevention/Good Housekeeping for Municipal Operations

In accordance with the General Permit, the regulated MS4 must mitigate or eliminate pollutant runoff from municipal operations on property that is owned or managed by UMAB and located within the UA. UMAB must:

- Maintain an inventory of all municipal operations conducted in, on, or associated with spaces owned or operated by UMAB that have the potential to cause or contribute to stormwater or surface water pollution.
- Implement written operation and maintenance procedures for all municipal operations identified in the inventory.
- Evaluate and prioritize the schedule for repairing and/or upgrading conveyances, structures, and outfalls associated with the MS4.
- Implement written procedures in a Stormwater Pollution Prevention Plan (SWPPP) for public works facilities, transfer stations, and school bus maintenance facilities, as applicable.



The MCM 6 Pollution Prevention/Good Housekeeping for Facility Operations requirements will be implemented as detailed below.

BMP 6A Inventory of Facilities in MS4

UMAB will continue to rely on its existing inventory of facilities established during a previous permit cycle to meet Part IV (C)(6)(a) of the General Permit.

Measurable Goal

UMAB will continue to maintain an inventory list and map of all owned fixed facilities and ensure that the list is routinely reviewed and updated, as necessary.

UMAB – James Kauppila, Director of Facilities Management

BMP 6B Written Operation and Maintenance (O&M) Plan

In accordance with Part IV (C)(6)(b) of the General Permit, UMAB will continue to implement its Pollution Prevention O&M Manual developed during a previous permit cycle for municipally owned fixed facilities. The O&M Manual addresses the following items:

- Erosion Prevention and Sediment Control
- Lawn Care
- Athletic Field Maintenance
- Vehicle and Equipment Washing
- Vehicle and Equipment Fueling
- Spill Prevention and Cleanup
- Parts Cleaning/Storage
- Petroleum and Chemical Storage/Handling/Disposal
- Garbage Storage
- Painting
- Floor Drains
- Road Maintenance

Measurable Goals

1. UMAB will continue to maintain current, annually review for improvements, and implement the O&M Manual for owned fixed facilities.
2. UMAB will continue to implement items and programs identified in the O&M Manual.
3. UMAB will continue to conduct annual employee training to prevent and reduce stormwater pollution from the municipal operations and facilities subject to the General Permit.
4. UMAB will continue to report in each Annual Report (**Section 1.1.3**) on the types of trainings presented, the percentage of municipal and contract staff, specific staff occupations, the length of the training, training content delivered, and effectiveness of the trainings.

UMAB – James Kauppila, Director of Facilities Management



BMP 6C Sweeping Program

In accordance with Part IV (C)(6)(b)(iii) of the General Permit, UMAB will continue to sweep all paved roads and paved parking lots maintained by UMAB.

Measurable Goals

During each permit year, UMAB will continue to sweep all paved roads and paved parking lots maintained by UMAB. Sweeping activities will be completed at a minimum of once per year soon after snowmelt.

UMAB – James Kauppila, Director of Facilities Management

BMP 6D Catch Basin and Stormwater Structure Inspections

In accordance with Part IV (C)(6)(b)(iv) of the General Permit, UMAB will continue to inspect catch basins and other stormwater structures that accumulate sediment.

Measurable Goals

1. UMAB will continue to inspect State owned catch basins and stormwater structures that accumulate sediment, such that each catch basin and stormwater structure is inspected at least once every other year.
2. During each permit year, UMAB will continue to clean catch basins and stormwater structures that accumulate sediment, such that excessive sediment accumulation does not occur within each basin/structure.
3. UMAB will continue to document catch basin and stormwater structure inspections.

UMAB – James Kauppila, Director of Facilities Management

BMP 6E Infrastructure Maintenance and Repairs

In accordance with Part IV (C)(6)(c) of the General Permit, UMAB will continue to implement its O&M plan for all facility operations identified in BMP 6B.

Measurable Goals

1. During each permit year, UMAB will continue to maintain, repair, and upgrade its storm sewer system infrastructure as needed based on the results of its inspections, available funding, and prioritized projects.
2. UMAB will continue to implement existing procedures to track maintenance, repairs, and upgrades to the storm sewer system infrastructure.
3. UMAB will continue to implement an approach to prioritize projects for the storm sewer system infrastructure.

UMAB – James Kauppila, Director of Facilities Management

BMP 6F Stormwater Pollution Prevention Plan

Part IV (C)(6)(d) of the General Permit requires UMAB to implement written procedures in a SWPPP for vehicle or equipment maintenance areas, fueling areas, and from all other vehicle and equipment cleaning facilities that are owned or operated by the permittee.

This requirement does not apply to UMAB. Portions of UMAB were previously regulated under Maine's Industrial Stormwater Program. However, MDEP granted a waiver from



the Industrial Stormwater Program due to lack of exposure to precipitation. The waiver was also granted because there does not exist an outfall associated with the regulated activities.

A SWPPP will be established for any future qualifying facilities, as required by applicable regulation.

UMAB – James Kauppila, Director of Facilities Management

SECTION 5 | GENERAL REQUIREMENTS

5.1 Management Approval and Certification

UMAB 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.

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 – UMAB

2/23/2022

Date

Dir. of Facilities Management
Title



SECTION 6 | REFERENCES

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

US Environmental Protection Agency. Updated August 2002. *Measurable Goals Guidance for Phase II Small MS4's*. US EPA Office of Water.
<http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm>

US Environmental Protection Agency. Updated August 2002. *National Menu of Best Management Practices for NPDES Storm Water Phase II*. US EPA Office of Wastewater Management. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm>

US Environmental Protection Agency. March 2000. *Storm Water Phase II Compliance Assistance Guide*. US EPA Office of Water.
<http://www.epa.gov/npdes/pubs/comguide.pdf>

US Environmental Protection Agency. January 2000. *Stormwater Phase II Final Rule Fact Sheet Series, EPA 833-F-00*. US EPA Office of Water.
<http://cfpub1.epa.gov/npdes/stormwater/swfinal.cfm>

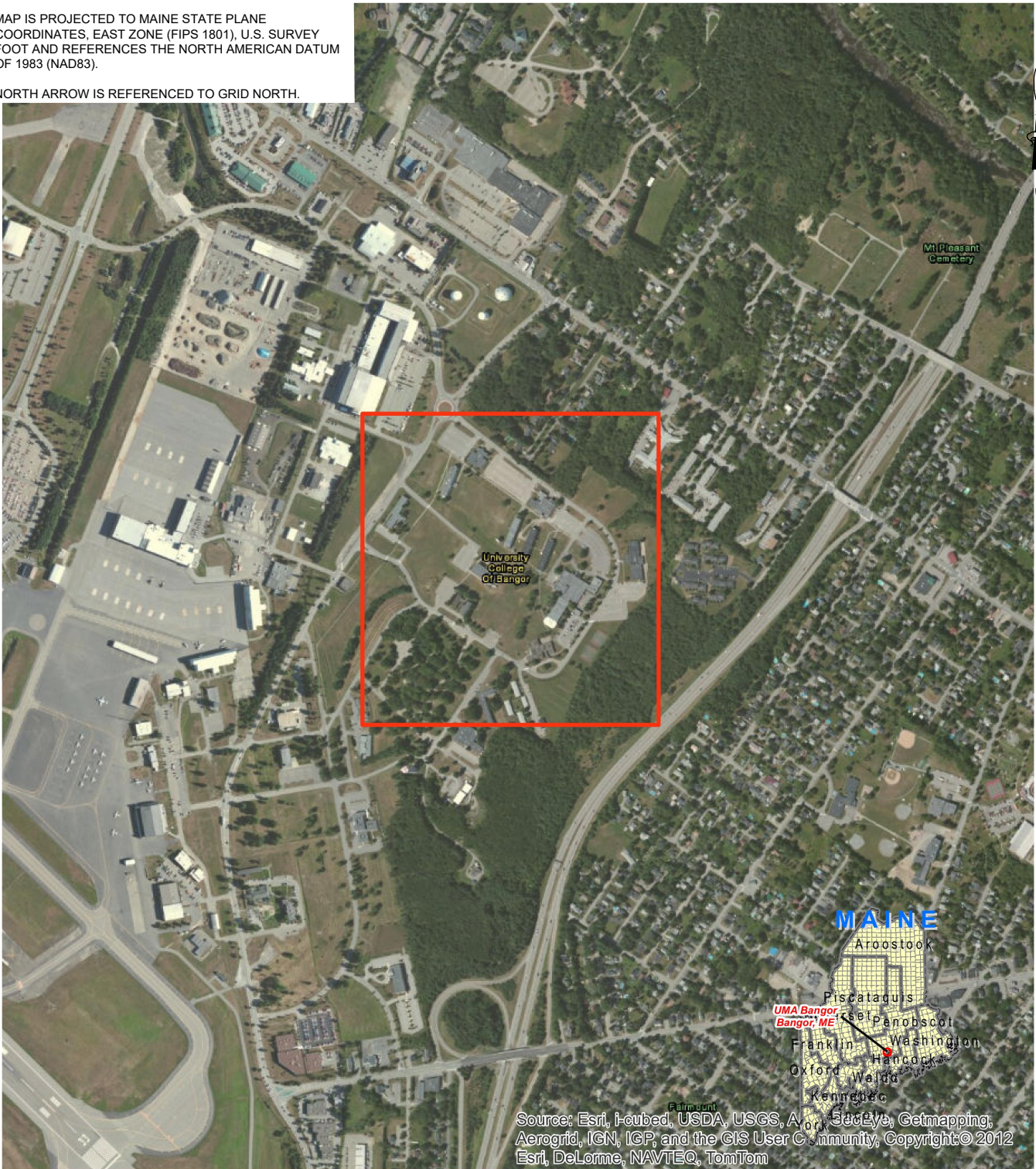
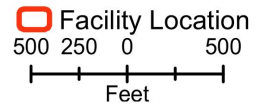


APPENDIX A
LOCATION MAP

MAP NOTES:

1. HALEY WARD DEVELOPED THIS MAP FOR GENERAL REFERENCE PURPOSES ONLY. ANY USE OF THIS MAP AND/OR IMAGERY AND/OR THE THEMES THEY REPRESENT FOR ANY OTHER PURPOSE IS NOT RECOMMENDED AND WOULD CONSTRAIN MAP INTEGRITY.
2. BASE MAPPING COURTESY OF ESRI, 2013.
3. MAP IS PROJECTED TO MAINE STATE PLANE COORDINATES, EAST ZONE (FIPS 1801), U.S. SURVEY FOOT AND REFERENCES THE NORTH AMERICAN DATUM OF 1983 (NAD83).
4. NORTH ARROW IS REFERENCED TO GRID NORTH.

Legend



Source: Esri, i-cubed, USDA, USGS, AeroGRID, IGN, IGP, and the GIS User Community, Copyright© 2012 Esri, DeLorme, NAVTEQ, TomTom

**UMA - BANGOR CAMPUS
BANGOR, MAINE**

MAP

DWG: **FIG. 1**

JN: 10021.002

SCALE: AS NOTED

BY: WAB

DATE: 2022.02.18

REV:

REV DATE:





APPENDIX B
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	University of Maine at Augusta - Bangor Campus			Permittee ID #	MER042003
Name and title of chief elected official or principal executive officer	Buster Neel, Chief Business Officer				
Mailing Address	46 University Drive				
Town/City	Augusta	State	Maine	Zip Code	04330-9448
Daytime Phone	(207) 621-3041	Email	buster.neel@maine.edu		
PRIMARY CONTACT PERSON FOR OVERALL STORMWATER MANAGEMENT PROGRAM (if different than PEO/CEO)					
Name and Title	James Kauppila, Director of Facilities Management				
Mailing Address	46 University Drive				
Town/City	Augusta	State	Maine	Zip Code	04330-9448
Daytime Phone	(207) 262-7734	Email	james.kauppila@maine.edu		
STORMWATER MANAGEMENT PLAN (SWMP)					
Urbanized Area (sq. mi.)	0.25 square miles				
I have attached our updated SWMP with ordinances, SOPs, forms. <input checked="" type="checkbox"/>					
Name of streams, wetlands, or waterbodies to which the regulated small MS4 discharges (<i>attach additional sheets as necessary</i>): Birch Stream and Kenduskeag Stream via the City of Bangor stormwater conveyance system					
List of impaired waterbodies that receive stormwater from the regulated small MS4 (<i>attach additional sheets as necessary</i>): Birch Stream via the City of Bangor stormwater conveyance system					
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	<div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;"> <small>DocuSigned by:</small> <small>DA9BF54B753E430...</small> </div>			Date	2/23/2022

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	

Legal Notices

**NOTICE OF INTENT TO FILE
FOR COVERAGE UNDER STATE OF MAINE
GENERAL PERMIT FOR THE DISCHARGE OF STORMWATER FROM
SMALL STATE AND FEDERALLY OWNED MUNICIPAL SEPARATE
STORM SEWER SYSTEMS**

The University of Maine at Augusta - Bangor Campus (UMAB) intends to file a Notice of Intent (NOI) to comply with the State of Maine General Permit for the Discharge of Stormwater from Small State and Federally Owned Municipal Separate Storm Sewer Systems (MER042000, W008163-5Y-B-R) issued December 8, 2021, and an associated Stormwater Management Plan (SWMP) with the Maine Department of Environmental Protection (DEP).

The NOI and SWMP will be filed on or about March 1, 2022, and will be available for public inspection at DEP's Bangor office during normal business hours. Copies may also be seen at UMAB in Bangor, Maine.

Comments on the documents, or 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, or 30 days from the date of this notice, whichever is longer. Requests shall identify the name of the municipality filing the NOI, the Permit number, and state the nature of the issue(s) to be raised. 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.

During the time specified above, persons wishing to receive copies of draft permits and supporting documents, when available, may request them from DEP. Persons receiving a draft permit shall have 30 days in which to submit comments or to request a public hearing on the draft. Public comment will be accepted until a final administrative action is taken to approve, approve with conditions or deny this application. Written public comments or requests for information may be made to:

Gregg Wood, Division of Water Quality Management
Maine Department of Environmental Protection
106 Hogan Road
Bangor, ME 04401
gregg.wood@maine.gov

Feb. 23, 2022

Sarah King

From: Sarah King
Sent: Wednesday, February 23, 2022 4:29 PM
To: 'richard.may@bangormaine.gov'
Cc: Andrea Dickinson; Jim Kauppila
Subject: UMAB, Notice of Interconnected MS4

Hi Rich,

The University of Maine at Augusta – Bangor Campus (UMAB) operates a small State-owned Municipal Separate Storm Sewer System (MS4) regulated under the State of Maine Department of Environmental Protection “General Permit for the Discharge of Stormwater from Small State and Federally Owned Municipal Separate Storm Sewer Systems” (General Permit), effective October 1, 2022 (MER042000/W008163-5Y-B-R).

The General Permit requires UMAB to notify any downstream regulated MS4 to which their stormwater system may be physically interconnected. Therefore, the purpose of this email is to notify you of interconnections between the UMAB stormwater system and the stormwater system that you operate. There is no action required on your part at this time, as this communication is for notification purposes only.

Contact me if you have any questions or require additional information relevant to this subject.

Thank you,
Sarah



Sarah King, PE
Senior Project Engineer
t: 207.989.4824 m: 208.701.5670
a: One Merchants Plaza, Suite 701, Bangor, ME 04401





APPENDIX C

GENERAL PERMIT FOR DISCHARGE OF STORMWATER FROM SMALL STATE AND FEDERALLY OWNED MUNICIPAL SEPARATE STORM SEWER SYSTEMS

**State of Maine
Department of Environmental Protection
Bureau of Water Quality**

**General Permit for the Discharge of Stormwater from Small
State and Federally Owned
Municipal Separate Storm Sewer Systems**



MER042000

December 8, 2021

Final Permit

General Permit--Municipal Separate Storm Sewer Systems

Maine Pollutant Discharge Elimination System (MEPDES)/Maine Waste Discharge License (WDL)

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PERMIT



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION
AUGUSTA, ME 04333

DEPARTMENT ORDER

IN THE MATTER OF

MUNICIPAL SEPARATE STORM SEWER SYSTEM)	MAINE POLLUTANT DISCHARGE
GENERAL PERMIT)	ELIMINATION SYSTEM PERMIT
STATE OF MAINE)	
MER042000)	MAINE WASTE DISCHARGE LICENSE
W008163-5Y-B-R)	RENEWAL
	APPROVAL	

Pursuant to the provisions of Federal law Title 33 USC, §1251, and Maine Law 38 M.R.S., Section 414-A et seq., and applicable regulations, the Maine Department of Environmental Protection (Department/DEP) has considered an application by the State of Maine to renew Maine Pollutant Discharge Elimination System (MEPDES) permit #MER042000/Maine Waste Discharge License W008163-5Y-A-N General Permit (GP), with its supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

APPLICATION SUMMARY

Pursuant to applicable laws and rules of the State’s MEPDES program, the Department’s Bureau of Water Quality, Division of Water Quality Management has developed a GP for discharges of stormwater from state and federally owned facilities to surface waters of the state. This GP is being issued as a combination MEPDES permit/WDL and has been assigned #MER042000. This GP is a two-step general permit pursuant to 40 Code of Federal Regulation (CFR) §122.28(d)(2). If applicable, the Department will establish a list of required actions and corresponding schedules of compliance for MS4 permittees in a separate Department Order based on a Department review of the permittee’s Notice of Intent (NOI) and Storm Water Management Plan (SWMP).

REGULATORY SUMMARY

On January 12, 2001, the Department received authorization from the U.S. Environmental Protection Agency (EPA) to administer the National Pollutant Discharge Elimination System (NPDES) permit program in Maine. From that point forward, the program has been referred to as the MEPDES permit program. The terms and conditions of this GP are consistent with the requirements established in the MEPDES permit program.

PERMIT

CONCLUSIONS

Based on the findings in this GP, and subject to the terms and conditions listed in Parts I-IV of this GP and a list of required actions and corresponding schedules of compliance for each permit specific Department Order, the Department makes the following conclusions:

1. The discharge(s) covered under this GP, either by itself or in combination with other discharges, will not lower the quality of any classified body of water below such classification.
2. The discharge(s) covered under this GP, either by itself or in combination with other discharges, will not lower the quality of any unclassified body of water below the classification which the Department expects to adopt in accordance with state law.
3. The provisions of the State's antidegradation policy, Maine law, 38 M.R.S. § 464(4)(F), will be met, in that:
 - (a) Existing in-stream water uses and the level of water quality necessary to protect and maintain those existing uses will be maintained and protected;
 - (b) Where high quality waters of the State constitute an outstanding natural resource, that water quality will be maintained and protected;
 - (c) Where the standards of classification of the receiving water body are not met, the discharge will not cause or contribute to the failure of the water body to meet the standards of classification;
 - (d) Where the actual quality of any classified receiving water body exceeds the minimum standards of the next highest classification that higher water quality will be maintained and protected; and
 - (e) Where a discharge will result in lowering the existing water quality of any water body, the Department has made the finding, following opportunity for public participation, that this action is necessary to achieve important economic or social benefits to the State.
4. The discharge(s) covered under this GP will be subject to effluent limitations that require application of best practicable treatment as defined in 38 M.R.S. § 414-A(1)(D).

PERMIT

ACTION

Based on the findings and conclusions as stated above, the Department APPROVES GP #MER042000, *General Permit for the Discharge of Stormwater from State and Federally Owned Municipal Separate Storm Sewer Systems*, which results in a discharge of stormwater to surface waters of the state, SUBJECT TO THE ATTACHED CONDITIONS, including:

1. The attached conditions included as Part I-IV of this GP.
2. *Maine Pollutant Discharge Elimination System Permit Standard Conditions Applicable To All Permits*, revised July 1, 2002, attached.
3. This GP becomes effective on October 1, 2022 and expires at midnight five (5) years after that date. If the GP is to be renewed, it will remain in force until the Department takes final action on the renewal. Persons wishing to obtain coverage under this GP must apply for coverage by way of the submission of a Notice of Intent (NOI) not later than March 1, 2022.

DONE AND DATED AT AUGUSTA, MAINE, THIS 8 DAY OF December, 2021.

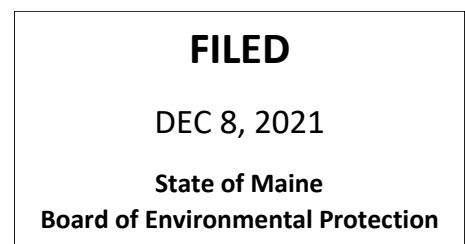
COMMISSIONER OF ENVIRONMENTAL PROTECTION

BY: 

for Melanie Loyzim, Commissioner

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of Public Notice April 9, 2021.



Date filed with Board of Environmental Protection

This Order prepared by GREGG WOOD, BUREAU OF WATER QUALITY

MER042000 12/8/2021

PART I. Coverage Under This Permit

A. AUTHORITY

A waste discharge permit is required for the direct or indirect discharge of pollutants to waters of the State. A two-step general permit will be issued for point source discharges (direct discharges) of stormwater. A violation of a condition or requirement of a general permit constitutes a violation of Maine's water quality laws and the federal Clean Water Act and subjects the discharger to penalties under *Organization and Powers*, 38 M.R.S. § 349, and § 309 of the Clean Water Act. Nothing in this GP is intended to limit the Department's authority under the waste discharge and water classification statutes or rules. This GP does not affect requirements under other applicable Maine statutes such as Site Location of Development (Site Law), Stormwater Management, and Natural Resources Protection Act (NRPA). This GP does not prevent a state or federal owned facility from adopting stricter standards than contained in this GP or state or federal standards.

B. PERMIT COVERAGE

This MS4 GP is part of a two-step general permit pursuant to 40 CFR §122.28(d)(2). The terms and conditions contained herein are applicable to all regulated small MS4s. The Department will also issue a separate permittee specific Department Order (DEP Order) for each MS4. If applicable, The DEP Order will establish a list of required actions and a corresponding schedule of compliance for each action item. This GP in conjunction with the permittee specific DEP Order authorizes the direct discharge of stormwater from a regulated MS4 to waters of the State other than groundwater, provided that the MS4 is located in an Urbanized Area as determined by the inclusive sum of the 2000 and 2010 Decennial Census by the Bureau of Census. Small MS4s are those entities which meet the definition in 40 CFR Part 122.26(b)(16). Regulated small MS4s are those entities required pursuant to 40 CFR 122.26(a)(9)(i)(A) to obtain stormwater permit coverage to operate their small MS4. Discharges from regulated small MS4s must meet the requirements of this GP, the permittee specific DEP Order, and applicable provisions of Maine's waste discharge and water classification statutes and rules. Compliance with this GP and permittee specific DEP Order authorizes a person to discharge stormwater, pursuant to Water Pollution Control Law, 38 M.R.S. § 413, as described below. Discharges listed in Part IV(C)(3)(h) are excluded from coverage under this GP and the permittee specific DEP Order. Unless otherwise explicitly noted, this GP and the permittee specific DEP Order only covers operations or activities associated with stormwater runoff within an identified Urbanized Area.

- 1. Effective date of this General Permit.** This GP becomes effective on October 1, 2022 and expires at midnight five (5) years after that date. Persons wishing to obtain coverage must apply for coverage by way of the submission of a NOI not later than March 1, 2022. New permittees seeking coverage under this GP may submit a NOI to the Department at any time during the 5-year term of this GP.

PART I. Coverage Under This Permit (cont'd)

B. PERMIT COVERAGE (cont'd)

The Department must review the NOI submitted by each applicant to determine whether the information is complete and to establish the additional terms and conditions necessary to meet 40 CFR §122.34. The Department will follow the procedure outlined in Part III of this GP to establish a list of required actions and a corresponding schedule of compliance for the action items for each permittee specific DEP Order.

The Department will notify an applicant within 15 working days of receipt of an NOI as to whether or not the NOI is deemed complete for processing by the Department. Pursuant to Department rule 06-096 CMR Chapter 2, *Rule Concerning the Processing of Applications And Other Administrative Matters*, a request for a hearing on an application must be received by the Department, in writing, no later than 20 days after the application is accepted as complete for processing. The request must indicate the interest of the person filing the request and specify the reasons why a hearing is warranted. If the Department does not notify the applicant within 15 working days of this time, the NOI is accepted. An applicant is authorized to discharge when the GP becomes effective and the applicable permittee specific DEP Order is issued as a final document. If applicable the DEP Order will establish a list of required actions and a corresponding schedule of compliance for the action items is issued as a final agency action. In the event coverage under the GP is not granted, the Department must notify the applicant of the reason(s) for not granting coverage. A person may apply for issuance of an individual MEPDES permit if the proposed discharge(s) is not approvable for coverage under this GP.

2. **Waiver of authorization.** The Department may grant a regulated small MS4 a waiver from the requirement to obtain authorization only if:
 - a. The MS4 does not contribute to the pollutant load of a physically interconnected regulated MS4 (see 40 CFR 122.32(d)(1)); and
 - b. The MS4 discharges any pollutant(s) that has/have been identified as a cause of impairment of any water body to which it discharges, stormwater controls are not needed based on waste load allocations that are part of an EPA approved or established “total maximum daily load” (TMDL) that addresses the storm water issue of significance. See 40 CFR 122.32(d)(2).

3. **Continuation of Coverage.** Coverage under this GP and the permittee specific DEP Order will be continued provided there are no changes in the discharge as described in the NOI. If changes occur or are proposed, the permittee having filed the NOI must notify the Department, as specified in this GP. Upon reissuance of a new GP, a permittee wishing to continue coverage must submit a new NOI to the Department.

PERMIT

PART I. Coverage Under This Permit (cont'd)

B. PERMIT COVERAGE (cont'd)

If this GP and a permittee specific DEP Order are not reissued, revoked or replaced prior to the expiration date, both will be administratively continued and remain in force and effect. In that case, any permittee who was granted permit coverage prior to the expiration date will automatically remain covered by the administratively continued GP and permittee specific DEP Order until the earlier of:

- a. Reissuance or replacement of this GP, at which time the permittee must submit a new NOI to the Department in accordance with the new GP to maintain authorization to discharge;
 - b. The permittee's submittal of a Notice of Termination (NOT);
 - c. Issuance of an individual permit for the permittee's discharges; or
 - d. A formal permit decision by the Commissioner not to reissue this GP, at which time the permittee must seek coverage under an alternative general permit or individual permit.
4. **Limitations on Coverage.** This GP does not authorize a stormwater discharge that requires an individual waste discharge permit or is required to obtain coverage under another waste discharge GP. The Department may require any permittee with a discharge authorized by this GP to apply for and obtain an individual permit or an alternative GP. Any interested person may petition the Department to take action under this paragraph. Examples of when an individual waste discharge permit may be required are specified in rule.
5. **Annual Fee.** Coverage under the GP and the permittee specific DEP Order will be continued upon payment of an annual fee. Fees must be paid by check or money order, payable to **Treasurer, State of Maine.**
6. **Individual Permit or Alternative GP.** When an individual permit is issued to a discharger otherwise subject to this GP, or the discharger is authorized to discharge under an alternative GP, the applicability of this GP to the individual permittee and the permittee specific DEP Order are automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative GP, whichever the case may be. When an individual permit is denied to a permittee otherwise subject to this GP, or the operator is denied for coverage under an alternative GP, the applicability of this GP to the individual MEPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the Commissioner.

PART I. Coverage Under This Permit (cont'd)

C. COMPLIANCE

1. **Compliance.** Regulated small MS4s must remain in compliance with all standards and requirements of this GP and the permittee specific DEP Order. Non-compliance with any of the standards and requirements of this GP or with any of the standards and requirements of a permittee specific DEP Order constitutes a violation of the GP and the CWA. If the Department determines that the standards of this GP or permittee specific DEP Order have not been met, the Department will notify the permittee and may undertake one or more of the following actions:
 - a. Authorize coverage under this GP after appropriate controls and implementation procedures designed to bring the discharge into compliance with this GP and the permittee specific DEP Order and water quality standards have been implemented as determined by the Department;
 - b. Require an individual waste discharge permit;
 - c. Inform the person that the discharge is prohibited; or
 - d. Take enforcement action to address the violation(s).
2. **Non-stormwater.** This GP does not authorize discharges that are mixed with sources of non-stormwater, other than those discharges in compliance with Part IV (C)(3)(h).
3. **Discharge of hazardous substances, chemicals, or oil.** This GP does not authorize the discharge of hazardous substances, chemicals, or oil resulting from an on-site spill.
4. **Total maximum daily load (“TMDL”).** This GP does not authorize a direct discharge that is inconsistent with any EPA approved TMDL waste load allocation.
5. **Violation of water quality standards.** This GP does not authorize a discharge that causes or contributes to a violation of a water quality standard. Discharges covered under this GP may not:
 - a. Contain any pollutant, including toxic substances, in quantities or concentrations, which may cause or contribute to any adverse impact on the receiving water;
 - b. Be to a receiving water which is not meeting its classification standard for any characteristic which may be affected by the discharge; or
 - c. Impart color, taste, turbidity, radioactivity, settleable materials, floating substances or other properties that cause the receiving water to be unsuitable for the designated uses ascribed to its classification.

PART I. Coverage Under This Permit (cont'd)

C. COMPLIANCE (cont'd)

6. **Waste discharge license (groundwater).** A waste discharge license (“WDL”) may be required for the discharge of stormwater through any well or wells, including drywells and subsurface fluid distribution systems. For complete requirements, see *Rules To Control The Subsurface Discharge Of Pollutants*, 06-096 CMR 543 (effective October 6, 2006), and *Stormwater Management*, 06-096 CMR 500 Appendix D (last amended August, 2015).
 - a. A “subsurface fluid distribution system” is an assemblage of perforated pipes, drain tiles, or similar mechanisms intended to distribute fluids below the surface of the ground.
 - b. A “well” is a bored, drilled, or driven shaft the depth of which is greater than the largest surface dimension, whether the shaft is typically dry or contains liquid; or a dug hole the depth of which is greater than the largest surface dimension; or a subsurface fluid distribution system.
 - c. “Well injection” means the subsurface discharge of fluids into or through a well.
7. **Removed Substances.** Solids, sludges, filter backwash or other pollutants removed or resulting from the treatment of stormwater must be disposed of in a manner approved by the Department.
8. **Monitoring Requirement.** The Department may require monitoring of an individual discharge as may be reasonably necessary in order to characterize the nature, volume or other attributes of that discharge or its sources.
9. **Other Information.** When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Department, he or she must promptly submit such facts or information.
10. **Endangered Species.** Pursuant to State and Local Cooperation Law, 12 M.R.S. § 12806, A state agency or municipal government shall not permit, license, fund or carry out projects that will:
 - a. Significantly alter the habitat identified under Conservation of Endangered Species Law, 12 M.R.S. § 12804, subsection 2 of any species designated as threatened or endangered under this subchapter; or
 - b. Violate protection guidelines set forth in 12 M.R.S. § 12804, subsection 3.

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PART II. Definitions

The following terms have the following meanings as used in this GP and the permittee specific DEP Order in addition to the definitions found in Chapter 520 of the Department's rules, and applicable statutory definitions.

- A. **Applicant** - Means a state or federally owned facility which files an NOI pursuant to Part III of this GP.
- B. **Best Management Practices (BMP)** - Means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.
- C. **Catch basin evaluation** - Means an inspection of a catch basin structure that includes documentation of water quality. Water quality evaluation includes, at a minimum, visual observations of sheen, discoloration, foaming, evidence of sanitary sewage, excessive algal growth, and similar visual indicators, as well as observations of odor and the depth of sediment in the sump. This evaluation may be conducted in conjunction with a routine cleaning event or separately, in order to determine which structure(s) require cleaning.
- D. **Commissioner** - Means the Commissioner of the Maine Department of Environmental Protection.
- E. **Common Plan of Development or Sale** - Means a subdivision under municipal law as determined by the municipality where the subdivision is located.
- F. **Compensation Fee Utilization Plan** - Means a plan that specifies how funds received as a fee payment will be allocated to reduce the impact of stormwater pollution to an impaired waterbody.
- G. **Construction Activity** - Means:
 - 1. Construction activity including one acre or more of disturbed area, or activity with less than one acre of total land area that is part of a common plan of development or sale, if the common plan of development or sale will ultimately disturb equal to or greater than one acre; or
 - 2. Any other construction activity designated by the Department based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the State.
- H. **Department (DEP)** - Means the State of Maine Department of Environmental Protection.

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PART II. Definitions (cont'd)

- I. **Direct Discharge** - The definition of “Direct Discharge” in this GP has been taken from Maine law 38 M.R.S. § 466 (“Definitions”) and is as follows: “any discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation or vessel or other floating craft, from which pollutants are or may be discharged.”
- J. **Discharge** - Means any spilling, leaking, pumping, pouring, emptying, dumping, disposing or other addition of pollutants to the waters of the state (for the purpose of this GP, located within the permittee’s UA and not including groundwater.)
- K. **Discharge Point** – For the purposes of this permit the location where collected and concentrated stormwater flows are discharged from the facility such that the first receiving waterbody into which the discharge flows, either directly or through a separate storm sewer system, is a water of the state.
- L. **Disturbed Area** - Means all land areas that are stripped, graded, grubbed, filled or excavated at any time during the site preparation or removing vegetation for, or construction of, a project. Cutting of trees, without grubbing, stump removal, disturbance or exposure of soil is not considered “disturbed area”. “Disturbed area” does not include routine maintenance but does include redevelopment and new impervious areas. “Routine maintenance” is maintenance performed to maintain the original line and grade, hydraulic capacity, and original purpose of the facility. Paving impervious gravel surfaces provided that an applicant or permittee can prove the original line and grade and hydraulic capacity will be maintained and original purpose of the gravel surface remains the same is considered routine maintenance.
- M. **Dry Weather Flow** - Means any observable flow from an outfall when there has not been measurable precipitation greater than 1/4 of an inch, or ice or snow melt within 72 hours prior to the outfall inspection.
- N. **Dry weather inspection** - Means an inspection of an outfall that includes observations of sheen, discoloration, foaming, evidence of sanitary sewage, excessive algal growth, and similar visual indicators, as well as detection of odor. These inspections must be completed during a dry weather flow condition (when the storm sewer system is not impacted by current or recent precipitation) or when the outfall is not flowing even if it is within the 72 hours of precipitation greater than 1/4 of an inch, or ice or snow melt.
- O. **Education/Outreach Campaign** - Means a specific set of activities aimed at an identified target audience organized to achieve a particular goal. Campaigns are the totality of all the efforts and tools used to achieve the goal.
- P. **Education Outreach tool** – A method used to deliver a message to a target audience. Messages may be printed materials such as brochures or newsletters; electronic materials such as websites or online ads; mass media such as newspaper articles or public service announcements (radio or television); or displays in public areas at the facility.

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PART II. Definitions (cont'd)

- Q. Education Outreach to change behavior** – Means to promote and reinforce desirable behaviors designed to reduce stormwater pollution.
- R. Education/Outreach Program** - Means all the education and outreach campaigns and activities to meet minimum control measure 1 (MCM1) and may include activities in the other minimum control measures.
- S. Illicit Discharge** - Means 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 this GP.
- T. Impaired Waterbody** - Means a waterbody that is not attaining water quality criteria or standards, as determined by the Department.
- U. Low impact development** - “Low impact development” or “green infrastructure” means site planning and design strategies intended to replace or replicate predevelopment hydrology through the use of source control and relatively small-scale measures integrated throughout a site to disconnect impervious surfaces and enhance filtration, treatment, and management of stormwater runoff as close to its source as possible. Low impact development strategies may be either nonstructural or structural, except that low impact development strategies utilizing structural stormwater management techniques shall be limited to an impervious contributing drainage area equal to or less than 1 acre. Low impact development strategies include, but are not limited to: bioretention filters, grass swales and channels, vegetated filter strips, permeable pavements, rain gardens and vegetated rooftops.
- V. Maintenance** - “Maintenance” means an activity undertaken to maintain operating condition, original line and grade, hydraulic capacity, and original purpose of the project. Paving an impervious gravel surface at original line, grade and hydraulic capacity is considered maintenance. Replacement of a building is not considered maintenance of the building.
- W. Message** – Information distributed to a specific target audience.
- X. Municipal Separate Storm Sewer Systems (MS4)** - Means a conveyance or system of conveyances designed or used for collecting or conveying stormwater (other than a publicly owned treatment works (POTW), as defined at 40 CFR 122.2, or a combined sewer), including, but not limited to, roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels or storm drains owned or operated by any municipality, sewer or sewage district, Maine Department of Transportation (MDOT), Maine Turnpike Authority (MTA), State agency or Federal agency or other public entity that discharges to waters of the State other than groundwater.

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PART II. Definitions (cont'd)

- Y. New development or construction** - “New development or construction” means activity undertaken to develop property, including but not limited to: the construction of buildings, parking lots, roads and other new impervious surfaces; landscaping; and other activities that disturb land areas. New development or construction does not include redevelopment or maintenance. Permitted state and federally owned facilities may define new development more stringently.
- Z. Notice of Intent (NOI)** - Means a notification of intent to seek coverage under this GP and a permittee specific DEP Order as provided in Part III(A), made by the applicant to the Department on an NOI form(s) provided by the Department. This is also the mechanism used to request coverage under this GP and under a permittee specific DEP Order.
- AA. Outfall** - Means the point source where the MS4 discharges from a pipe, ditch or other discrete conveyance to the waters of the state other than groundwater, or to another entity’s MS4, and does not include pipes, cross culverts, tunnels or other conveyances which connect segments of the same stream or other waters of the state and are used to convey waters of the state. For the purposes of this GP, a discharge to a location not defined as a water of the state is not considered an outfall.
- BB. Outreach to raise awareness** – Means to introduce information that may be new to or not well understood by a target audience.
- CC. Permittee** - Means a state or federally owned facility that owns or operates the storm sewer system authorized under this GP.
- DD. Permittee Specific DEP Order** – Means a document issued by the Department, following a formal public comment period, that establishes a list of required actions and corresponding schedules of compliance for a limited number of BMPs associated with the implementation of the GP.
- EE. Person** - Means an individual, firm, corporation, municipality, quasi-municipal corporation, state agency, federal agency or other legal entity which creates, initiates, originates or maintains a discharge authorized by this GP.
- FF. Point source** - See “**Direct Discharge**”. For the purposes of this GP, the definitions of “Point source” and “Direct Discharge” are identical.
- GG. Redevelopment** - “Redevelopment” means an activity, not including maintenance, undertaken to redevelop or otherwise improve property in which the newly developed area is located within the same footprint as the existing developed area.

PART II. Definitions (cont'd)

- HH. Regulated Small MS4** - Means any Small MS4 authorized by this General Permit or the general permits for the discharge of stormwater from MaineDOT and MTA small MS4s or state or federally owned or operated small MS4s including all those located partially or entirely within an UA. A list of regulated state and federally facilities is included as Appendix A2 of this GP. A list of these regulated small MS4s owned or operated by municipalities is included in Appendix A1 of this GP.
- II. Small MS4** - Means any MS4 that is not already covered by the Phase I MS4 stormwater program including municipally owned or operated storm sewer systems, state or federally-owned systems, such as colleges, universities, prisons, military bases and facilities, and transportation entities such as MDOT and MTA road systems and facilities. See also 40 CFR 122.26(b)(16).
- JJ. Stormwater** - Means the part of precipitation including runoff from rain or melting ice and snow that flows across the surface as sheet flow, shallow concentrated flow, or in drainage ways.
- KK. Stormwater Issue of Significance (SIS)** – Means any local, regional or statewide issue that must be addressed in order to improve water quality in receiving water bodies. SIS can include single pollutants or multiple pollutants as well as certain actions (increased impervious cover, lack of community awareness, construction, agricultural impacts, etc.) conditions (lack of infiltration, treatment at the source, etc.) or phenomena (development pressure, urban sprawl, flooding, urbanization, pH/acidification, etc.).
- LL. Stormwater Management Plan (SWMP)** - Means a written plan developed, implemented, and enforced by a permittee. The SWMP defines the specific BMPs that will be implemented by the permittee under each of the six MCMs set forth in Part IV of the GP, which are designed to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP). The SWMP defines: the measurable goal(s) by which each BMP will be evaluated; the person(s) responsible for implementing each BMP, and; the date by which each BMP will be implemented.
- MM. Stormwater Pollution Prevention Plan (SWPPP)** - Means a written plan developed and implemented for select facility operations to reduce or eliminate pollutants as described in this GP.
- NN. Total Maximum Daily Load (TMDL)** – Means the sum of the individual waste load allocations (WLAs) for point sources and load allocations (LAs) for non-point sources, natural background and a margin of safety. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. If BMPs or other nonpoint source pollution controls make more stringent load allocations practicable, then waste load allocations can be made less stringent. Thus, the TMDL process provides for nonpoint source control tradeoffs.
- OO. Urban Impaired Stream** - Means a stream that fails to meet water quality standards because of effects of stormwater runoff from developed land. Urban Impaired Streams are those streams identified in Appendix C of this GP.

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PART II. Definitions (cont'd)

- PP. Urban Runoff** - Means stormwater runoff from an Urbanized Area, that may contain elevated levels of pollutants such as hydrocarbons, chlorides, heavy metals and nutrients which may cause or contribute to a waterbody's impairment. In many instances flow such as frequent elevated storm flows, low base flows, and high temperatures will also be significant contributors to a waterbody's impairment.
- QQ. Urbanized Area (UA)** - Means the area of the State of Maine so defined by the inclusive sum of the 2000 decennial census and latest decennial census (2010) by the U.S. Bureau of the Census.
- RR. Waste Load Allocation (WLA)** – Means the portion of a receiving waters loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitutes a type of water quality-based effluent limitation.
- SS. Waters of the State** - Means any and all surface waters and subsurface waters that are contained within, flow through, or under or border upon this state or any portion of the state, including the marginal and high seas, except such waters as are confined and retained completely upon the property of one person and do not drain into or connect with any other waters of the state, but not excluding waters susceptible to use in interstate or foreign commerce, or whose use, degradation or destruction would affect interstate or foreign commerce.

Part III. Procedure

A. Obtaining Coverage To Discharge.

1. Public Notice

Applicant Public Notice. Applicants are required to publish a public notice that the NOI and a SWMP are being filed with the Department. The notice must be published **within** the 30 calendar-day period prior to the NOI being sent to the Department. The notice must be published in the legal advertisement section of a daily or weekly newspaper having general circulation in the area where the discharges authorized by this GP will occur and by making the notice available on the facility's official internet web site. Applicants are required to provide a letter of notice to all regulated small MS4s into which the MS4 discharges, and also to persons who have requested to be notified or interested persons to the respective applicants.

- 2. NOI submission.** The operator of any regulated small MS4 that initiates, creates, originates or maintains a discharge described in Part I of this GP and that wishes to obtain coverage under this GP and a permittee specific DEP Order must file a NOI with the Department that meets the requirements of this GP not later than March 1, 2022. The applicant must file the NOI using a form(s) provided by the Department. The applicant must sign the NOI in accordance with this section. New permittees seeking coverage under this GP may submit a NOI to the Department at any time during the 5-year term of this GP. By submitting a signed NOI, the applicant agrees to comply with the terms and conditions of this GP and any applicable permittee specific DEP Order. The applicant must register one set of NOI forms for all discharges from the regulated small MS4 within the UA that are operated by the facility.

A NOI must be filed with the Department electronically via e-mail or via regular mail at the following address:

MS4 Program Manager
 Department of Environmental Protection
 17 State House Station
 Augusta, Maine 04333-0017
 e-mail: gregg.wood@maine.gov.

- a. **Signatory Requirements.** All NOIs, reports, certifications or information either submitted to the Department, or that this GP requires to be maintained by the permittee, must be signed and certified in accordance with *Waste Discharge Licenses*, 06-096 CMR 521(5) (effective date January 23, 2001).

All permit applications must be signed as follows:

1. For a state or federally owned facility, the signature must be by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

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Part III. Procedure

- (i) The chief executive officer of the agency, or
 - (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of the USEPA).
- b. **Reports** - All reports required by permits, and other information requested by the Department must be signed by a person described in paragraph (2)(a)(1) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
- 1. The authorization is made in writing by a person described in paragraph (a) of this section;
 - 2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the permittee, municipality or regulated MS4, (a duly authorized representative may thus be either a named individual or any individual occupying a named position).
 - 3. The written authorization is submitted to the Department.
- c. **Certification.** Any person signing a document under paragraph (a) or (b) of this section must make the following 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.

Part III. Procedure (cont'd)

3. Contents of NOI.

- a. **NOI Form.** The NOI must be filed on a form(s) provided by the Department and at a minimum, must include the following.
 - i. Name of the state or federally owned or operated facility and the name, title, address, email address, and telephone number of the chief elected official or principal executive officer.
 - ii. Name, address, email address, and telephone number of the primary contact person responsible for the stormwater management program.
 - iii. Permit number assigned to the state or federally owned or operated facility under the previous Department MS4 permit, if any.
 - iv. Name of the receiving stream(s), wetland(s) or waterbody(s) to which the MS4 discharges, and a list of the impaired waterbodies which receive stormwater from the MS4.
 - v. An estimate of the area in square miles, of the facility.
 - vi. A copy of the SWMP detailing how the permittee will comply with the terms and conditions of this GP.

The Department may require an applicant to submit additional information that the Department deems reasonably necessary to evaluate the consistency of the subject activity with the requirements for authorization under this GP.

4. **Public Comment.** The Department will provide the public with an opportunity for comment on or request a public hearing on the contents of the submitted NOIs and the SWMPs by making the information available on the Department's internet site shortly after the NOI has been deemed complete for processing. Pursuant to Department rule 06-096 CMR Chapter 2, *Rule Concerning the Processing of Applications And Other Administrative Matters*, a request for a hearing on an application (NOI in this case) must be received by the Department, in writing, no later than 20 days after the NOI is accepted as complete for processing. The request must indicate the interest of the person filing the request and specify the reasons why a hearing is warranted. The public comment period on the NOI and SWMP documents is a minimum of 30 calendar days. Based on a review of the NOI, SWMP or other information, the Department may extend the public comment period, require additional information or may deny coverage to discharge under this GP and require submission of an application for an individual or alternative MEPDES permit.

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Part III. Procedure (cont'd)

5. **Action by Commissioner.** The Commissioner will return as incomplete any NOI that does not satisfy the requirements of Part III (A)(3) of this GP.
 - a. The Commissioner may deny coverage to discharge under this GP if more than 30 calendar days have elapsed following the applicant's receipt of a written request by the Commissioner that the applicant submit additional information required pursuant to this GP and the applicant has not timely and completely submitted such information.
 - b. The Commissioner will deny coverage to discharge under this GP if the subject activity is ineligible for this GP, if the applicant cannot or is unlikely to comply with this GP, or for any other reason provided by law.
 - c. The Commissioner will grant coverage to discharge under this GP if the SWMP, in combination with the permittee specific DEP Order is consistent with the requirement to reduce pollutants under the Department's standards to protect water quality and to satisfy the appropriate water quality requirements of the Clean Water Act.
6. **Authorization to Discharge.** The applicant is authorized to discharge under the terms and conditions of this GP and permittee specific DEP Order when the Commissioner issues a Department Order granting said coverage. Granting or denying coverage to discharge under this GP and permittee specific DEP Order must be in writing.
7. **Effect of Denial of Coverage To Discharge.** Denial of coverage under this GP constitutes notice to the applicant that the subject activity may not lawfully be conducted or maintained without issuance of an individual MEPDES permit or authorization to discharge under an alternative GP. Denial of coverage under this GP must be in writing.
8. **Permittee Specific DEP Order.** Following the public comment period on the NOI, the Department will issue a permittee specific DEP Order. If applicable, the DEP Order will establish additional terms and conditions, including but not limited to, a list of required actions and corresponding schedules of compliance for a limited number BMPs associated with the implementation of this GP. The permittee specific DEP Order will be subject to a formal 30-day public comment period. New permittee's seeking coverage under this GP may submit a NOI to the Department at any time during the 5-year term of this GP.

Part IV. Requirements

The permittee must at all times continue to meet the requirements for authorization set forth in this GP and in the permittee specific DEP Order. In addition, the permittee must ensure that authorized discharges and activities are conducted in accordance with the following required conditions.

A. Initial Stormwater Management Plan (SWMP). The permittee must develop an initial SWMP to be submitted with the NOI for coverage under this GP consistent with the requirements of this section. The SWMP must describe how it will implement the six Minimum Control Measures (MCMs), set forth in Part IV(C) of this GP, and how the permittee will implement the requirements of Part IV(D) of the GP.

1. Stormwater Management Plan Requirements.

a. For each of the six MCMs in Part IV(C), the following information must be included:

1. The measurable goal(s) by which each best management practice (BMP) will be evaluated;
2. The person(s) or position(s) responsible for implementing each BMP; and
3. The date by which each BMP will be implemented including as appropriate, timelines and milestones for implementation of BMPs.

b. The SWMP must also address the requirements of Part IV(D) for discharges to waters with EPA-approved TMDLs and to waters that are listed as Urban Impaired Streams.

B. Modified Stormwater Management Plan (SWMP). The permittee must implement and enforce a written (hardcopy or electronic) SWMP. The initial SWMP must be updated within 60 days of permit authorization to include how the permittee will meet all requirements of the DEP Order. The modified SWMP must include a summary of the comments received during the MS4s public comment period and any corresponding changes to the SWMP made in response to the comments received. The permittee must perform all actions required by the permittee specific DEP Order in accordance with the timelines in the permittee specific DEP Order. Unless otherwise specified by the Department in writing, the permittee must submit the updated SWMP to the Department indicating how the permittee has modified their SWMP to be consistent with the GP and permittee specific DEP Order. To modify the schedule established in a permittee specific DEP Order, the permittee must file an application on a DEP form with the Department that includes a justification to formally modify the original permittee specific DEP Order.

The SWMP must include all information required in Part IV(A)(1) of the GP and include all applicable written standard operating procedures (SOPs), inspection forms for all applicable MCMs and notification letters to inter-connected MS4s. This SWMP must be signed in accordance with the signatory requirements in Part III (A)(2)(a).

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Part IV. Requirements

1. **Plan availability.** The permittee must have a signed copy of the SWMP available at the state or federal office and on the official state or federal web site if there is a website and must make a copy of the SWMP available to the following immediately upon request;
 - a. Department or U.S. Environmental Protection Agency (EPA) personnel upon request.
 - b. In the case of a regulated small MS4 adjacent to or interconnected with the permittee's storm sewer system, to the operator of that regulated small MS4;
 - c. In the case of a regulated small MS4 stormwater discharge to a water supply watershed, to the public water supply company; and
 - d. Members of the public.
2. **Keeping Plans Current.** The permittee must keep the SWMP current. The permittee must allow the public the opportunity to comment on changes made to the SWMP consistent with this Part at a minimum of once per year (1/Year).

The SWMP must be amended if the Department or the permittee determines that:

- a. The actions required by the BMPs fail to control pollutants to meet the terms and conditions of this GP 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;
- c. New information results in a shift in the SWMP's priorities.

The Department will notify the permittee in writing if the Department determines that the SWMP must be amended to comply with the terms and conditions of the GP and the permittee specific DEP Order. Within 30 calendar days of such notification, unless otherwise specified by the Department in writing, the permittee must respond in writing to the Department indicating how the permittee plans to modify the SWMP to address the Departments comments. Within 90 calendar days of the permittee's written response or within 120 calendar days of the Department's original notification, whichever is less, unless otherwise specified by the Department in writing, the permittee must revise the SWMP and submit it to the Department for final review.

For BMPs in the SWMP that are not required to comply with this GP or the permittee specific DEP Order, the BMPs and or implementation schedule may be amended as appropriate without the need for public comment. Changes must be submitted to the Department in the Annual Report following the permit year the change(s) were made.

Part IV. Requirements (cont'd)

C. Minimum Control Measures (MCMs). For each MCM, the permittee must define specific BMPs; designate a person(s) or position(s) responsible for each BMP; define a timeline for implementation of each BMP; and define measurable goals for each BMP. The MCMs to be included in the SWMP are as follows.

1. MCM1 – Education/Outreach Program (Program)

The permittee must at a minimum develop and implement an ongoing Education/Outreach Program addressing stormwater discharges and impacts on water bodies and steps that can be taken to reduce pollutants in stormwater runoff. The program must be designed to address stormwater issues of significance. The ultimate objective of the program is to change behavior of the target audiences so that pollutants in stormwater are reduced.

- a. The permittee must develop an outreach program as part of its SWMP and implement it over the term of the permit.
- b. The education/outreach program must define the target audiences, specific messages, message delivery/distribution tools, evaluation methods and an implementation schedule for each target audience.
- c. The permittee may partner with other MS4s, community groups, or watershed associations to implement the education/outreach program to meet this GP requirement.
- d. The education/outreach program must define the awareness and behavior change goals and identify the party or parties responsible for program implementation.
- e. The permittee may use existing materials if they are appropriate for the target audience and message the permittee chooses to deliver, or the permittee may develop its own outreach materials.
- f. The permittee must identify methods it will use to evaluate the effectiveness of each awareness and behavior change campaign. Any message or delivery mechanism found ineffective or of unsatisfactory efficacy, must be modified accordingly.
- g. The education/outreach program must include the following as a minimum:
 1. An Outreach to Raise Awareness Campaign of storm water pollution issues targeted at the permittee’s community members and/or if the permittee participates as a member in the local stormwater working group, then participation in the group’s campaign. Outreach to raise awareness is defined as a means to introduce information that may be new to or not well understood by the target audience. Campaigns to raise awareness are typically delivered broadly.

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Part IV. Requirements (cont'd)

The permittee will implement a minimum of one (1) awareness campaign during the term of this permit. Each campaign will be delivered using a minimum of three (3) outreach tools per year. These outreach tools may include: printed materials such as brochures, posters or newsletters; electronic materials such as websites, e-mail, or online ads; mass media such as newspaper articles or public service announcements (radio or television); social media such as Facebook or Twitter, public events or meetings or displays in public areas at the facility.

2. An Outreach to Change Behavior Campaign so that pollutants in storm water are reduced. Outreach to Change Behavior means to promote and reinforce desirable behaviors designed to reduce storm water pollution. Campaigns to change behavior are typically delivered to small, targeted segments of the population through direct communication.

The permittee must promote a minimum of one (1) behavior change per permit term and shall be directed to at least one (1) audience annually and using a minimum of three (3) different outreach tools per year. Campaigns for behavior change may be delivered through targeted workshops, incentives that encourage desired behavior, pledge drives to commit to desired behaviors, or other methods that effect behavior change. Printed materials such as brochures, posters or newsletters; electronic materials such as websites; mass media such as newspaper articles or public service announcements (radio or television); social media such as Facebook or Twitter, or displays in public areas at the facility may also be used to promote the desired behavior.

- h. The program must show evidence of focused campaigns for specific audiences such that outreach tools and messages are appropriate for the audiences. The program must also show evidence that progress toward the defined awareness and behavior goals of the program has been achieved. The permittee must identify methods that it will use to evaluate the effectiveness of each outreach campaign (awareness one (1) campaign and behavior change one (1) campaign). If appropriate, evaluation efforts may evaluate more than one campaign. For example, the same evaluation effort may document both the level of the general public's stormwater awareness and the targeted audience's current behavior.

Any methods used to evaluate the effectiveness of the program must be tied to the defined goals of the program and the overall objective of changes in behavior and awareness. To evaluate effectiveness the permittee must conduct a baseline evaluation prior to each campaign. The baseline evaluation must be relevant and appropriate and may have occurred in the previous permit cycle or in the current permit cycle. The baseline evaluation is to be followed by an evaluation in year five of this permit to assess the overall effectiveness of the outreach program.

Part IV. Requirements (cont'd)

- i. The permittee must document in each Annual Compliance Report: the messages for each audience; the methods of distribution; the outreach tools used, the measures/methods used to determine the on-going effectiveness of the campaigns, and any changes planned based on the measures of effectiveness.

2. MCM2 - Public involvement and participation

The objective of this minimum control measure is to involve the facility’s community in both the planning and implementation process of improving water quality and reducing storm water quantity via the storm water program. A program planned with a stakeholder group is more likely to be successful in achieving its goals. The population within the MS4 can provide valuable input and assistance to a MS4’s storm water management program. Therefore, the MS4 community must be given opportunities to play an active role in both the development and implementation of the program. An active and involved MS4 community is crucial to the success of a storm water management program because it allows for broader support, additional expertise and a conduit to other programs. The MS4 community members are also more likely to apply these lessons/BMPs at home.

- a. The permittee must comply with applicable state and local public notice requirements using effective mechanisms for reaching the MS4 community and comply with the public notice requirements of the Maine Freedom of Access Act, 1 M.R.S. §§ 401 et seq. (“FOAA”) when the permittee involves stakeholders in the implementation of this GP. The permittee must document the meetings and attendance in the annual report as a way of measuring this goal.
- b. The permittee or regional storm water group of which the permittee is a member must annually host/conduct or participate in a public event (for example, storm drain stenciling, stream clean-up, household hazardous waste collection day, volunteer monitoring, neighborhood educational events, conservation commission outreach program, Urban Impaired Stream outreach program, or adopt a storm drain or local stream program). The event must include a pollution prevention and/or water quality theme. The target audience does not need to be the entire facility or entire urbanized area but should be aimed at a segment of the facility or municipal population that the permittee wishes to reach. The permittee is encouraged to plan this event and consult with the Department to ensure it will satisfy this GP’s requirements.

Part IV. Requirements (cont'd)

3. MCM3 - Illicit Discharge Detection and Elimination (IDDE) Program

Each permittee must implement and enforce a program to detect and eliminate illicit discharges and non-stormwater discharges, as defined in 06-096 CMR 521(9)(b)(2), except as provided in paragraph h of this section. The program must address illicit discharges in 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. The period between identification and elimination of an illicit discharge is not a grace period. Discharges from an MS4 that are mixed with an illicit discharge are not authorized by this GP and remain unlawful until eliminated.

- a. The permittee must continue to implement a non-stormwater discharge regulatory mechanism that prohibits the discharge of non-stormwater discharges and provides for the implementation of appropriate enforcement procedures and actions. MS4s without the authority to enact a regulatory mechanism shall ensure the written policies or procedures are in place to address this requirement.
- b. 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 this section including:
 - i. A reference or citation of the authority the permittee will use to implement all aspects of the IDDE program.
 - ii. Clearly identify in the written IDDE Plan the responsibilities with regard to eliminating illicit discharges. The written IDDE Plan must identify the lead facility staff or department(s) responsible for implementing the IDDE Program as well as any other departments that may have responsibilities for aspects of the program. Where multiple departments have responsibilities with respect to the IDDE program, specific areas of responsibility must be defined and processes for coordination and data must be established and documented.
 - iii. Written procedures for dry weather outfall inspections and wet weather assessments which must be consistent with Part IV(3)(e) and Part IV(3)(f) respectively, of this GP.

PERMIT

Part IV. Requirements (cont'd)

- iv. Steps that must be taken when a potential illicit discharge is identified (whether during dry weather inspections, during routine work, during opportunistic inspection of other infrastructure or through other methods) to perform an initial investigation to identify the source(s) of discharge, including but not limited to: efforts to identify the nature of the discharge; source investigation; reporting; clean up; corrective actions/elimination; and enforcement.
 - v. Steps that must be taken, upon verification of the source of the illicit discharge, to notify all responsible parties for any such discharge and require immediate cessation of improper disposal practices in accordance with its legal authorities. Where elimination of an illicit discharge within 60 calendar days of its identification and verification as an illicit discharge is not possible, the permittee must establish an expeditious schedule for its elimination and report the dates of identification and schedules for removal in the permittee's annual reports. The permittee must immediately commence and continue actions identified in the schedule as necessary for elimination. The permittee must diligently pursue actions identified in the schedule to be consistent with the intent of this GP. In the interim, the permittee must take all reasonable and prudent measures to minimize the discharge of pollutants to and from the MS4, including follow-up screening and inspection to confirm permanent elimination of the discharge.
 - vi. A Quality Assurance Project Plan (QAPP) describing the procedures to be used during the investigation and monitoring of those outfalls identified as flowing during outfall inspections.
- c. Permittees that can demonstrate compliance with an individual Maine Pollutant Discharge Elimination System (MEPDES) permit and or Maine Waste Discharge License (WDL) conditions within their Urbanized Areas and which result in Sanitary Sewer Evaluation Surveys (SSES) and/or written Capacity, Management, Operations and Maintenance (CMOM) plans may utilize these programs to support the IDDE requirements of this GP at the discretion of the Department, provided the sanitary sewer conveyance and/or treatment provider supports this finding.
 - d. Permittees must maintain a map(s) of their state and/or federally owned or operated storm sewer system. The map(s) must show the location of all stormwater catch basins, connecting surface and subsurface infrastructure and 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 and 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.

PERMIT

Part IV. Requirements (cont'd)

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. The permittee is not required to maintain maps of their sanitary sewer system for compliance with this GP.

- e. Permittees must implement a dry weather outfall inspection program. This inspection program-must include:
 - i. For each outfall, the following information must be included: type (e.g. pipe or ditch), material, size of conveyance, the name and location of the nearest named waterbody to which the outfall eventually discharges. Each outfall must have a unique identifier.
 - ii Conducting visual dry weather inspections on 100% of their identified outfalls during the five-year term of this GP.
 - iii. Outfalls that are inaccessible due to safety concerns are not required to be inspected but a substitute inspection must be conducted of the first (i.e., closest) accessible inspection location within the stormwater system (e.g., catch basin, manhole, pipe, etc.) that drains to the inaccessible outfall.
 - iv. Where dry weather flow is present the permittee must sample the discharge to determine if the discharge is an illicit discharge and then must investigate until either a source is identified, or it has been determined that the evidence of the illicit discharge is due to naturally occurring source(s).
 1. Sampling and analysis must include, but is not limited to:
 - a. *E.coli*, enterococci, total fecal coliform or human bacteroides;
 - b. Ammonia, total residual chlorine, temperature and conductivity; and
 - c. Optical enhancers or surfactants.

All analyses can be performed with field test kits or field instrumentation and are not subject to 40 CFR Part 136 requirements given the sampling is for investigative purposes and not to determine compliance with this GP. Sampling for ammonia and surfactants must use sufficient sensitive methods to detect said parameters at or below the minimum reporting concentrations as follows: 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).

PERMIT

Part IV. Requirements (cont'd)

- v. Where dry weather flow at an outfall does not exhibit evidence of an illicit discharge, the permittee must take steps to determine and confirm that flow during dry weather conditions is only uncontaminated groundwater, water from a natural resource, or an allowable non-stormwater discharge that has entered the system and collect at least one (1) sample per the 5-year permit term in accordance with the protocols set forth in the approved QAPP and analyzed for the parameters listed in Part IV(C)(3)(e)(iv)(1).
- vi. Outfalls that are flowing during dry weather are exempt from the dry weather investigation required in Part IV(C)(3)(e)(iv) under any of the following conditions:
 - 1. The outfall is associated with roadway drainage in undeveloped areas with no dwellings and no sanitary sewers,
 - 2. The outfall is associated with only subsurface drainage for any of the following: an athletic field, a park or undeveloped green space and associated parking without services,
 - 3. The outfall is from cross-country drainage that neither cross nor are in proximity to sanitary sewer alignments through undeveloped land,
 - 4. The contributing pipes to the outfall have been televised in a previous permit cycle and determined to be structurally sound with no illicit connections or connections from structures that could contribute an illicit discharge, and no new construction or redevelopment has occurred in the outfall drainage area since the screening, or
 - 5. The outfall was screened in accordance with Part IV(C)(3)(e)(iv) in a previous permit cycle and no new construction or redevelopment has occurred in the outfall drainage area since the screening.
- vii. The permittee may rely on screening conducted under previous permits to the extent it meets the requirements in Part IV(C)(3)(e)(iv) and no new construction or redevelopment has occurred in the outfall drainage area since the screening.
- viii. Steps that must be taken upon verification of the source of the illicit discharge to locate, identify and eliminate the illicit discharge within the UA as expeditiously as possible.

PERMIT

Part IV. Requirements (cont'd)

- f. Prior to the expiration date of this GP, 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 (but is not limited to):
 - i. Areas within the MS4 facility property that have combined sewer systems;
 - ii. Sanitary sewer systems located in a common trench with stormwater infrastructure, particularly those with known infiltration;
 - iii. Subsurface wastewater disposal systems that are 20 years old or more, or those in areas known to have experienced recent malfunctions or failures;
 - iv. Permittee owned dog parks;
 - v. Complaints of sewage odor at a stormwater outfall during wet weather events;
 - vi. Direct discharge from the stormwater system to any of the following:
 - a. A public beach or recreational area;
 - b. A water body impaired for bacteria;
 - c. A shellfish bed; and/or
 - d. A drinking water supply.

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 GP, the permittee must identify these wet weather outfalls in its written IDDE plan and identify the wet weather outfalls targeted 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 the IDDE plan prior to the expiration date of the GP and permittee specific DEP Order, the permittee must implement the wet weather monitoring upon completion of the update IDDE plan update.

PERMIT

Part IV. Requirements (cont'd)

- g. Permittees are not required to report individual Sanitary Sewer Overflows (SSOs) separately from the sanitary sewer conveyance and/or treatment provider, however, permittees are required to summarize the SSO events that discharge to the MS4 in their annual reports. Permittees must work cooperatively with that provider to identify any potential source of pollution to the MS4 from an SSO.
- h. Allowable Non-Stormwater Discharges. This GP authorizes the following non-stormwater discharges. If the permittee identifies any of these sources as significant contributors of pollutants to the MS4, 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. The permittee must identify in its SWMP if it has identified any of these sources as a significant contributor of pollutants to the MS4.
- 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), and
 - hydrant flushing and firefighting activity runoff
 - water line flushing and discharges from potable water sources
 - individual residential car washing
 - dechlorinated swimming pool discharges

Part IV. Requirements (cont'd)

4. MCM4 – Construction Site Stormwater Runoff Control

Each permittee must implement and enforce a program to minimize or eliminate pollutants in any stormwater runoff to the regulated small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. 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.

- a. The permittee must develop and implement a construction site runoff program that includes the following elements:
 - i. A regulatory mechanism that requires the use of erosion and sediment control BMPs at construction sites consistent with the minimum standards outlined in Attachment C, *Erosion and Sedimentation Control, Inspections and Maintenance and Housekeeping* of this GP. Also see the Department’s website for a guidance document entitled *Maine Erosion and Sediment Control Practices Field Guide For Contractors* to assist permittee’s employees and contractors in developing BMPs for the regulatory mechanism. Permittees who have an existing regulatory mechanism must evaluate the mechanism and update it as needed within one (1) year of the effective date of this GP to provide the permittee with the necessary enforcement authority. Those permittees without an existing regulatory mechanism must develop a mechanism within one (1) year of the effective date of this GP and have an approved regulatory mechanism in place with the necessary enforcement authority within two (2) years of the effective date of this GP.
 - ii. 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 and procedures to consider information submitted by the public.
 - iii. Procedures for notifying construction site developers and operators of the requirements for registration under the Maine Construction General Permit and Chapter 500, Stormwater Management.
 - iv. Procedures for construction site operations to control waste such as discarded building materials, concrete truck wash-outs, chemicals, litter and sanitary waste at the construction site that may cause adverse impacts to water quality.

PERMIT

Part IV. Requirements (cont'd)

- v. Documentation of construction activity that disturbs one or more acres within the permittee's facility boundaries including:
 - a. Written (hardcopy or electronic) procedures for site inspections and enforcement of erosion and sediment control measures. Inspections are to be conducted by the permittee or third-party inspector. The procedures must clearly define who is responsible for site inspections as well as who has authority to implement enforcement procedures. The program must provide that the permittee may, to the extent authorized by law, impose sanctions to ensure compliance with the local program.
 - b. Inspections of construction sites to ensure erosion and sediment controls are in place and sediment is contained within the project site. Inspections must be completed as follows:
 - i. A minimum of three inspections must be completed during the active earth-moving phase of construction.
 - ii. A minimum of one inspection must be completed annually until a project reaches substantial completion, as defined by the MS4 permittee (i.e., facility).
 - iii. One of the three inspections must be conducted at project completion to ensure that the site reached permanent stabilization and all temporary erosion and sediment controls have been removed.
 - iv. Documentation of construction inspections, enforcement action and corrective actions taken.

5. **MCM5 - Post-Construction Stormwater Management in New Development and Redevelopment.**

Each permittee must implement and enforce a program to address post construction stormwater runoff to the maximum extent practicable 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 that discharge into the MS4.

- a. The permittee must implement strategies which include a combination of structural and/or non-structural BMPs appropriate to prevent or minimize water quality impacts.
 - i. **On or before December 31, 2022**, each permittee must develop and begin implementation of an enforceable program for stormwater management on new and redevelopment sites which establishes performance standards that are at least as stringent as the LID techniques contained in Table 1 of Attachment F of this permit unless such techniques are infeasible on a site. The enforceable program should, at a minimum, refer to Attachment F for guidance.

Part IV. Requirements (cont'd)

- b. To ensure adequate long-term operation and maintenance of post construction BMPs installed after July 1, 2008, each permittee must have and implement a post construction discharge program. This program must contain provisions as follows:
 - i. Conduct annual inspections completed by a qualified inspector, documenting that all on-site BMPs are adequately maintained and functioning as intended, and
 - ii. Require that if a post construction BMP requires maintenance, corrective action(s) are taken in no later than 60 days following the date the deficiency was identified. If 60 days is not possible, then the permittee must establish an expeditious schedule to complete the maintenance and establish a record of the deficiency and corrective action(s) taken.

6. MCM6 - Pollution Prevention/Good Housekeeping for Facility Operations.

The objective of this program is to mitigate or eliminate pollutant runoff from state and federal facility roads, other paved surfaces, infrastructure and facility operations on property that is owned or managed by the permittee and located within the UA.

- a. Permittees must maintain an inventory of all operations conducted in, on, or associated with the permittee's facilities, including buildings, roads, travel ways, parks and open space owned or operated by the permittee that have the potential to cause or contribute to stormwater or surface water pollution.
- b. Permittees must implement written (hardcopy or electronic) operation and maintenance (O&M) procedures for all operations identified in (a) above to reduce stormwater pollution to the maximum extent practicable. The O&M plan must address stormwater treatment and controls that are used to achieve compliance with the conditions of this GP.
 - i. The O&M plan must be up-to-date prior to the effective date of this GP and must be reviewed annually to iteratively improve strategies and practices to eliminate or better control pollutant discharges.
 - ii. The permittee must conduct annual employee training to prevent and reduce stormwater pollution from the permittee's operations and facilities subject to this GP. The permittee must report in each of its Annual Compliance Reports on the types of trainings presented, the percentage of employees and contract staff, and their occupation, that received training, the length of the training, and training content delivered.

Part IV. Requirements (cont'd)

- iii. 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.
- iv. The permittee must develop and implement a program to inspect catch basins and other stormwater structures that accumulate sediment. This program must include:

Developing and implementing a program to inspect all catch basins at least once every other year and, if necessary, clean catch basins and other stormwater structures that accumulate sediment and dispose of the removed sediments in accordance with current state law. The permittee must clean catch basins more frequently if inspections indicate excessive accumulation of sediment. Excessive accumulation is greater than or equal to 50 percent of the sump filled. If two consecutive inspections show excess accumulation, then the permittee must clean those CBs every year instead of every other year. If it is documented during two consecutive years of cleaning of a CB identified as accumulating excess material that there is little to no material in the sump (less than 25% of the sump) then that CB can return to the list of CBs to be inspected at least once every other year and cleaned more often if two consecutive inspections show excess accumulation.

- c. Permittees must evaluate and implement a prioritized schedule, as necessary, for repairing or upgrading the conveyances, structures and outfalls of the regulated small MS4.
- d. Permittees must implement written (hardcopy or electronic) procedures outlined in a stormwater pollution prevention plan (“SWPPP”) for vehicle or equipment maintenance areas, fueling areas and from all other vehicle and equipment cleaning facilities that are owned or operated by the permittee (unless the facility is currently regulated under Maine’s Industrial Stormwater Program). Implementation of this SWPPP must address long-term operation of structural and non-structural controls that reduce stormwater pollution to the maximum extent practicable.

1. Control measures

The permittee must select, design, install and implement control measures, adhering to good engineering practices and manufacturer’s specifications, to minimize pollutant discharges from all potential sources. The control measure(s) selected must be capable of meeting the non-numeric technology-based effluent limitations established in this section. Where more than one standard exists for a specific pollutant, compliance with this GP and the control measure design must be based on the most stringent standard. In selecting control measures, the permittee must consider:

Part IV. Requirements (cont'd)

- a. The quantity and nature of the pollutants and their potential to impact the water quality of the receiving waters;
- b. Preventing stormwater from coming into contact with polluting materials;
- c. Using control measures in combination;
- d. Assessing the type and quantity of pollutants, including their potential to impact receiving water quality;
- e. Minimizing impervious areas at the facility and infiltrating runoff onsite (including bioretention cells, green roofs, and pervious pavement, among other approaches) in accordance with State laws and regulations;
- f. Attenuating flow using open vegetated swales and natural depressions;
- g. Conserving and/or restoring riparian buffers; and
- h. Using treatment interceptors (*e.g.*, swirl separators and sand filters).

2. Non-numeric effluent limitations

The permittee must comply with the following non-numeric effluent limitations.

- a. Minimize exposure. The permittee must minimize the exposure of manufacturing, processing, and material storage areas (including, but not limited to, loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and runoff in order to minimize pollutant discharges. Unless impractical, the permittee must also:
 - i. Use grading, berming or curbing to prevent runoff of contaminated flows and divert run-on away from these areas;
 - ii. Locate materials, equipment, and activities so that potential leaks and spills are contained or able to be contained or diverted before discharge;
 - iii. Clean up spills and leaks promptly using dry methods (*e.g.*, absorbents) to prevent the discharge of pollutants;
 - iv. Properly dispose of materials used for spill or leak clean up to prevent used clean up materials from being a source of pollutants in stormwater;
 - v. Store leaky vehicles and equipment indoors or, if stored outdoors, use drip pans and absorbents;
 - vi. Use spill/overflow protection equipment;
 - vii. The washing of new or used vehicles or equipment is allowed with the following prohibitions and recommended best management practices:
 1. Engine, undercarriage and transmission washing is prohibited. Cleaning operations should minimize the detachment of paint residues, heavy metals or any other potentially hazardous materials from surfaces.

Part IV. Requirements (cont'd)

2. Vehicle and equipment washing should occur, where possible, on an impermeable surface (i.e., concrete, asphalt, plastic or other) and utilize an area that extends to a minimum of four (4) feet on all sides of the vehicle or equipment so that wash water and overspray falls initially on the impermeable surface. From the impermeable surface, wash water should then be directed to a vegetated area.
 3. Vehicles and equipment should not be washed near uncovered repair areas or chemical storage areas such that chemicals can be transported in wash water runoff. All wash water runoff should drain away from a shop repair or chemical storage area.
 4. Wash water from cleaning the interior of truck trailers and other large commodity carrying containers must be collected and discharged to a POTW or treated in a closed-loop, wash water recycling system.
 - viii. Drain fluids from equipment and vehicles that will be decommissioned, and, for any equipment and vehicles that will remain unused for extended periods of time, inspect at least quarterly for leaks.
 - ix. locate industrial materials and activities inside or protect them with storm resistant coverings where practical to do so.
- b. **Good housekeeping.** The permittee must keep clean all exposed areas that are potential sources of pollutants. The permittee must perform good housekeeping measures in order to minimize pollutant discharges, including but not limited to, the following:
- i. Sweep or vacuum at regular intervals as a primary measure or, alternatively, wash down the area as a secondary measure and collect and/or treat, and properly dispose of the washdown water;
 - ii. Store materials in appropriate containers that are labeled to specify contents;
 - iii. Keep all dumpster lids closed when not in use or ensure that discharges have a control measure. For dumpsters, waste bins and roll-off containers that do not have lids and could leak, ensure that discharges have a control measure (*e.g.* sheet flow to an upland vegetated buffer). Dumpsters and roll-off containers should only be used to hold solid waste materials and never used to hold liquid wastes. This permit does not authorize any dry weather discharges from dumpsters or roll-off containers;
 - iv. Minimize the potential for waste, garbage and floatable debris to be discharged by keeping exposed areas free of such materials, or by intercepting them before they are discharged;
 - v. Site and operate snow storage and disposal areas to prevent the discharge of snow directly into surface waters and minimize discharges of pollutants from snow maintenance activities. Permittees shall minimize the use of sodium chloride or other salts when possible and evaluate opportunities for use of alternative products.

Part IV. Requirements (cont'd)

- c. **Maintenance.** The permittee must maintain all control measures that are used to achieve effective operating condition, as well as all industrial equipment and systems, in order to minimize pollutant discharges. This includes:
 - i. Performing and documenting inspections and preventive maintenance of stormwater drainage, source controls, treatment systems, and equipment and systems that could fail and result in contamination of stormwater;
 - ii. Diligently maintaining non-structural control measures (*e.g.*, keep spill response supplies available, personnel appropriately trained);

- d. **Spill prevention and response.** The permittee must minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur in order to minimize pollutant discharges. The permittee must conduct spill prevention and response measures including, but not limited to, the following:
 - i. Plainly label containers 55 gallons or greater (*e.g.*, “Used Oil,” “Spent Solvents,” “Fertilizers and Pesticides”) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;
 - ii. Implement procedures for material storage and handling, including the use of secondary containment and barriers between material storage and traffic areas, or a similarly effective means designed to prevent the discharge of pollutants from these areas;
 - iii. Develop training on spill response procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. As appropriate, execute such procedures as soon as possible;
 - iv. Keep adequate and accessible spill kits on-site, located near areas where spills may occur or where a rapid response can be made; and
 - v. Notify appropriate facility personnel when a leak, spill, or other release occurs.

- e. **Erosion and sediment controls.** The permittee must minimize erosion by stabilizing exposed soils at the facility in order to minimize pollutant discharges and by placing flow velocity dissipation devices in stormwater swales and ditches at discharge locations, as necessary, to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points. The permittee must also use structural and non-structural control measures, as necessary, to minimize the discharge of sediment.

PERMIT

Part IV. Requirements (cont'd)

- f. **Management of runoff.** The permittee must divert, infiltrate, reuse, contain, or otherwise manage stormwater runoff to minimize pollutants in the discharges.
- g. **Salt storage piles or piles containing salt.** Unless otherwise authorized by variance pursuant to *Siting and Operation of Road Salt and Sand-Salt Storage Areas*, 06-096 Code of Maine Regulations (CMR) 574 (effective December 3, 2001), the permittee must enclose or cover storage piles of salt, or piles containing salt, used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces, in order to minimize pollutant discharges. This includes preventing stormwater runoff from coming into contact with covered piles. The permittee must implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile.
- h. **Employee training.** Annually, the permittee must train all employees who work in areas where industrial materials or activities are exposed to stormwater, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of the facility's stormwater pollution prevention team. The permittee must ensure the following personnel understand the requirements of this permit and their specific responsibilities with respect to those requirements:
 - i. Personnel who are responsible for the design, installation, maintenance, and/or repair of controls (including pollution prevention measures);
 - ii. Personnel responsible for the storage and handling of chemicals and materials that could become contaminants in stormwater discharges;
 - iii. Personnel who are responsible for conducting and documenting monitoring and inspections pursuant to this GP; and
 - iv. Personnel who are responsible for taking and documenting corrective actions pursuant to this GP.

Personnel must be trained in at least the following if related to the scope of their job duties (e.g., only personnel responsible for conducting inspections need to understand how to conduct inspections):

- v. An overview of what is in the SWPPP;
- vi. Spill response procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases, good housekeeping, maintenance requirements, and material management practices;
- vii. The location of all controls on the site required by this GP, and how they are to be maintained;
- viii. The proper procedures to follow with respect to the GP's pollution prevention requirements; and
- ix. When and how to conduct inspections, record applicable findings, and take corrective actions.

Part IV. Requirements (cont'd)

- i. **Dust generation and vehicle tracking of industrial materials.** The permittee must utilize control measures to minimize generation of dust and off-site tracking of raw, final, or waste materials. Discharges of pollutants associated with the facility's activity as the result of off-site tracking are not authorized by this GP.

3. Storm Water Pollution Prevention Plan – General Requirements

- a. **Availability of SWPPP.** The permittee must prepare a SWPPP for the facility prior to the effective date of this GP. If a permittee prepared a SWPPP for coverage under a previous version of this GP, the permittee must review and update the SWPPP to implement all provisions of this GP prior to the effective date of this GP. Upon receiving authorization under this GP, a copy of the SWPPP must be available to appropriate facility staff, Department staff, and USEPA staff. The permittee must keep a copy of the SWPPP on-site at all times for reference and review.
- b. **SWPPP preparation.** The SWPPP must be up-to-date prior to the effective date of this GP and must be prepared in accordance with good engineering practices and to industry standards. The SWPPP may be developed by either a person on the facility's staff or a third party, but it must be developed by a "qualified person" and must be certified in accordance with the signatory requirements of 06-096 CMR 521(5). A "qualified person" is a person knowledgeable in the principles and practices of stormwater controls and pollution prevention and possesses the education and ability to assess conditions at the facility that could impact stormwater quality, and the education and ability to assess the effectiveness of stormwater controls selected and installed to meet the requirements of the permit. A qualified person may include facility staff that is familiar with the facility's activities and control measures necessary to reduce or eliminate the discharge of pollutants associated with the activity.
- c. **Amended SWPPP.** The permittee must amend the SWPPP within thirty (30) calendar days of completion of any of the following:
 - i. A change in design, construction, operation, or maintenance at the facility that may have a significant effect on the discharge or potential for discharge of pollutants from the facility including the addition or reduction of industrial activity;
 - ii. Monitoring, inspections, or investigations by the permittee or by local, State, or Federal officials which determine the SWPPP is ineffective in eliminating or significantly minimizing the intended pollutants;
 - iii. A discharge under this GP that is determined by Department to cause or have the reasonable potential to cause or contribute to the violation of an applicable water quality standard.

Part IV. Requirements (cont'd)

- d. **SWPPP Contents:** This subsection describes the minimum requirements that must be addressed or contained within an acceptable SWPPP.
- i. **Stormwater Pollution Prevention Team.** The SWPPP must identify the individuals (by name or title) who comprise the facility's Stormwater Pollution Prevention Team. The Stormwater Pollution Prevention Team is responsible for assisting the facility manager in developing, implementing, maintaining and revising the facility's SWPPP. Responsibilities of each team member must be listed.
 - ii. **Nature of activities.** The SWPPP must provide a description of the nature of the activities at each facility.
 - iii. **Maps.** The SWPPP must contain a general location map with sufficient detail to identify the location of the facility and all receiving waters for all stormwater discharges. A site map depicting the following features must also be included with the SWPPP.
 - 1. Boundaries of the property and the size of the property in acres;
 - 2. Location and extent of significant structures and impervious surfaces;
 - 3. Directions of stormwater flow (use arrows);
 - 4. Locations of all stormwater control measures;
 - 5. Locations of all receiving waters, including wetlands, in the immediate vicinity of the facility;
 - 6. Locations of all stormwater conveyances including catch basins, ditches, pipes, and swales;
 - 7. Locations of potential pollutant sources;
 - 8. The location of all above ground tanks;
 - 9. For the purposes of the site map, identify areas of frequent spills (greater than three occurrences per year) and large spills (greater than 10 gallons) that have occurred in the last three years. All locations of fuel frequent/large spills must be documented within the SWPPP or applicable Spill Prevention Control & Counter Measure (SPCC) Plan;

Part IV. Requirements (cont'd)

10. Locations of all stormwater monitoring points;
 11. Locations of stormwater inlets, outlets, outfalls, and discharge points, with a unique identification code for each discharge point (*e.g.*, Outfall 001, 002) and an approximate outline of the areas draining to each discharge point;
 12. Locations of the following activities where such activities are exposed to precipitation:
 - fueling stations;
 - vehicle and equipment maintenance and/or cleaning areas;
 - loading/unloading areas;
 - locations used for the treatment, storage, or disposal of wastes;
 - liquid storage tanks;
 - processing and storage areas;
 - immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;
 - transfer areas for substances in bulk;
 - machinery; and
 - locations and sources of run-on to the site from adjacent property that contains significant quantities of pollutants.
- e. **Summary of potential pollutant sources.** The SWPPP must provide a description of areas of the facility and operations where materials or activities are exposed to stormwater or from which allowable non-stormwater discharges originate. Materials or activities include but are not limited to: street sweeping, roadway construction, repair and rehabilitation, maintenance of streets and rights-of-way, snow removal and storage, chemical and material storage, fleet maintenance and storage, and fertilizer, pesticide, and insecticide application and storage of materials. Structures located in areas of activity are potential sources of pollutants.

For each separate area identified, the description must include the following.

- i. **Activities in the area.** A list of the activities exposed to stormwater and the predicted direction of flow of stormwater from each activity and outfall/discharge point.

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Part IV. Requirements (cont'd)

- ii. **Pollutants.** A list of pollutants associated with each identified activity, which could be exposed to rainfall or snowmelt and could be discharged from the facility. The pollutant list must include all significant materials that have been handled, treated, stored or disposed, and that have been exposed to stormwater in the three years prior to the date you prepare or amend your SWPPP.
- iii. **Spills and leaks.** The permittee must document where potential spills and leaks could occur that could contribute pollutants to stormwater discharges, and the corresponding outfalls/discharge points that would be affected by such spills and leaks. The permittee must document all frequent or large spills and leaks of oil or toxic or hazardous substances that actually occurred at exposed areas, or that drained to a stormwater conveyance, in the three years prior to the date the SWPPP was prepared or last amended. The permittee must document the circumstances leading to the release and actions taken in response to the release and the measures taken to prevent the recurrence of such releases.
- iv. **Wastewater or process water containment.** Any stationary above ground tank, container, or container storage area used for the storage of wastewater or process water (does not include deicing materials for winter road maintenance) that has the potential to discharge to surface waters or a stormwater conveyance during a malfunction must be held in a secondary containment device capable of containing 100% of the contents of the tank, plus precipitation. The containment devices must meet all Federal and State rules for primary and secondary containment. Secondary containment requirements are waived if the tank is equipped with a level sensor and alarm to signal an overflow or leak and the facility has a contingency plan in place to remove excess liquid to a second containment structure or off-site treatment facility to prevent exposure to stormwater. The containment structures must be visually inspected for signs of deterioration at least once per year. The contingency plan and tank inspection procedure must be documented in the SWPPP.
- v. **Non-stormwater discharges** – The permittee must document that it has evaluated its site for the presence non-stormwater discharges not listed in MCM3 of this GP. Documentation must include the following.
 1. The date of the evaluation;
 2. A description of the evaluation criteria used;
 3. A list of the outfalls or onsite drainage points that were directly observed during the evaluation; and
 4. The action(s) taken, such as a list of control measures used to eliminate unauthorized discharge(s), or documentation that a separate MEPDES permit was obtained.

Part IV. Requirements (cont'd)

- vi. **Salt storage.** The permittee must document the location of any storage piles containing salt or other material or products, or liquid brine used for deicing or other purposes.
- vii. **Sampling data.** Existing dischargers must summarize all stormwater discharge sampling data collected at the facility during the previous permit term. The summary must include a narrative description (and may include data tables/figures) that adequately summarizes the collected sampling data to support identification of potential pollution sources at the facility. New dischargers and new sources must provide a summary of any available stormwater runoff data they may have.
- viii. **Method of on-site storage or disposal.** A storage practice or disposal method must be detailed for all raw materials, intermediate materials, final products and waste materials. Waste materials must be handled in accordance with applicable federal and State waste management rules and regulations.

4. Storm Water Pollution Prevention Plan – Control Measures

The permittee must review all control measures at least quarterly and complete corrective actions to modify any control measures that are not achieving the intended effect of minimizing pollutant discharges. The SWPPP must document the type and location of all control measures selected to ensure compliance with technology-based and water quality-based effluent limitations.

- a. **Best management practices (BMPs) considerations.** Best management practices must be applied to all areas described in the summary of potential pollutant sources documented in the SWPPP. The SWPPP must include an implementation schedule for all proposed BMPs. The permittee must consider, at a minimum, the following in selection of BMPs:
 - i. The quantity and nature of the pollutants, and their potential to impact the water quality of receiving waters;
 - ii. Preventing stormwater from coming into contact with polluting materials;
 - iii. Using control measures in combination to minimize pollutants in stormwater discharges;
 - iv. Opportunities to offset stormwater and temperature impacts from impervious areas on dry weather flows and low flow situations to streams;
 - v. Minimizing impervious areas at the facility and infiltrating runoff onsite (including bioretention cells, green roofs, and pervious pavement, among other approaches);
 - vi. Attenuating flow using open vegetated swales and natural depressions; and
 - vii. Use of treatment interceptors (e.g., swirl separators, sand filters, catch basin inserts/filters) to minimize the discharge of pollutants.

Part IV. Requirements (cont'd)

- b. **Non-structural control measures** The permittee must comply with the non-structural control measures in Part IV (6)(d)(2), *Non-Numeric Effluent Limitations*.

The permittee must review all structural BMPs at least quarterly and complete corrective actions to modify any BMPs that are not achieving the intended effect of minimizing pollutant discharges. The SWPPP must document the type and location of all BMPs selected to ensure compliance with technology-based and water quality-based effluent limitations.

5. Stormwater Pollution Prevention Plan Records

The permittee must keep the following inspection, monitoring, and certification records on site with the SWPPP. Records required to be kept with a facility's SWPPP are facility-specific except that any of the records listed below that are already being maintained in order to comply with other portions of this GP (e.g. catch basin cleaning, street sweeping) do not need to be stored on site with the SWPPP.

- a. Documentation of maintenance and repairs of control measures, including the date(s) of regular maintenance, date(s) of discovery of areas in need of repair/replacement, and for repairs, date(s) that the control measure(s) returned to full function, and the justification for any extended maintenance/repair schedules;
- b. All SWPPP inspection reports and visual monitoring reports required by this GP;
- c. A description of any deviations from the schedule for visual monitoring, and the reason for the deviations (e.g., adverse weather or it was impracticable to collect samples within the first 60 minutes of a measurable storm event);
- d. Dates and descriptions of all spills and leaks and corrective actions taken;
- e. Corrective Action Reports and summary of completed actions taken at the site, including event(s) and date(s) when problems were discovered and modifications occurred; and
- f. A copy of records for all employee SWPPP related training as required.

6. Monitoring Requirements

- a. **Procedures for conducting monitoring.** This GP contains routine facility inspections and visual monitoring. Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the discharge over the sampling and reporting period.

Part IV. Requirements (cont'd)

The SWPPP must document the procedures and frequencies for conducting quarterly routine facility inspections and visual monitoring where applicable. SWPPP documentation must include the following.

- i. Location of sample collection (discharge point designation);
- ii. Monitoring schedule including monitoring exceptions, adverse weather conditions, and waivers.
- iii. Stormwater samples should, whenever practicable, be collected within the first sixty (60) minutes of the beginning of a discharge during a storm event of greater than $\frac{1}{4}$ of an inch during a 24-hour period. Sampling events are only required during normal business hours. If a sample cannot be collected within the first 60 minutes, the permittee must document with inspection forms the reason(s) or circumstance(s) why it was not practicable to obtain a timely sample. Samples collected more than two (2) hours following the beginning of a discharge are not acceptable and will be rejected by the Department.

In the case of snowmelt, samples must be collected during a period with a measurable discharge from the representative outfall/discharge point.

If a stormwater discharge event does not occur during normal operating business hours an entire calendar quarter, the permittee must document in the SWPPP that there was no discharge to sample. Monitoring requirements under these circumstances are waived.

7. Routine Facility Inspections

- a. **Applicability.** All permittees with industrial stormwater discharges such as maintenance garages located in the UA must conduct routine facility inspections of areas of the facility covered by the requirements in this GP, including, but not limited to, the following:
 - i. Areas where materials or activities are exposed to stormwater;
 - ii. Areas identified in the SWPPP and those that are potential pollutant sources;
 - iii. Areas where spills and leaks have occurred in the past three years;
 - iv. Discharge points; and
 - v. Control measures used to comply with the limits contained in this GP.

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Part IV. Requirements (cont'd)

- b. **Minimum inspection requirements** - Routine facility inspections must be conducted once per calendar quarter each year the permittee is covered under this GP. These inspections must be equally spaced with a minimum of sixty (60) days between inspections whenever possible. At least once each calendar year, the routine inspection must be conducted during a period when a stormwater discharge is occurring. The permittee must document findings from each routine facility inspection in a signed, certified report maintained with the SWPPP including, but not limited to, the following:
- i. The inspection date and time;
 - ii. The name(s) and signature(s) of the inspector(s);
 - iii. Weather information (precipitation in the previous 48 hour period of time);
 - iv. All observations relating to the implementation of control measures at the operations or facility, including:
 1. A description of any discharges occurring at the time of the inspection;
 2. Any new discharges from and/or pollutants at the site;
 3. Any evidence of, or the potential for, pollutants entering the drainage system;
 4. Observations regarding the physical condition of and around all outfalls/discharge points, including any flow dissipation devices, and evidence of pollutants in discharges and/or the receiving water;
 - v. Any control measures needing maintenance, repairs, or replacement;
 - vi. Any additional control measures needed to comply with the GP requirements; and
 - vii. Any incidents of noncompliance.

Routine facility inspection requirements may be satisfied at the same time visual monitoring is conducted provided they are conducted during a qualifying storm event and all components of both monitoring types are included in the report.

- c. **Visual Monitoring.** All permittees required to have a SWPPP must conduct visual monitoring once per calendar quarter each year the permittee is covered under this GP. The permittee must collect a stormwater sample from each outfall/discharge point or a representative outfall/discharge point during a qualifying storm event of greater than 0.25 inches, or ice or snow melt and conduct a visual assessment of these samples. These samples are not required to be collected in accordance with 40 CFR Part 136 procedures but must be collected in such a manner that the samples are representative of the stormwater discharge. The sample must be collected in a clean, colorless glass or plastic container, and examined in a well-lit area. The visual assessment must be performed and documented in accordance with standard operating procedures outlined in document dated June 12, 2017, DEPLW0768 (or most current version), *Visual Monitoring of Stormwater Discharges Associated with Industrial Activity*. See Attachment E of this GP. The quarterly Visual Monitoring sample forms must be completed and kept on file with the SWPPP. Visual evidence of pollution in a stormwater sample indicates that modifications or additions to control measures are needed at the site.

Part IV. Requirements (cont'd)

The permittee must visually inspect and document or observe the sample for the following water quality characteristics:

1. Color;
2. Odor;
3. Clarity (diminished);
4. Floating solids;
5. Settled solids;
6. Suspended solids;
7. Foam;
8. Oil sheen; and
9. Other obvious indicators of stormwater pollution

If a stormwater discharge event associated with a qualifying storm event does not occur during normal operating business hours for an entire calendar quarter, the permittee must document in the SWPPP that there was no discharge to sample. Monitoring requirements under these circumstances are waived.

8. **Conditions Requiring SWPPP Review and Revision.** When any of the following conditions occur or are detected during an inspection, monitoring or other means, or the Department informs the permittee that any of the following conditions have occurred, the permittee must review and revise, as appropriate, the SWPPP (*e.g.*, sources of pollution; spill and leak procedures; non-stormwater discharges; the selection, design, installation and implementation of your control measures) so that pollutant discharges are minimized:
 - a. An unauthorized release or discharge (*e.g.*, spill, leak, or discharge of non-stormwater not authorized by this or another MEPDES permit to a water of the State) occurs at the operation or facility;
 - b. A discharge violates a condition of this GP or permittee-specific DEP Order;
 - c. A discharge violates a non-numeric effluent limitation contained in this GP, or an applicable water quality-based limitation or ambient water quality criteria associated with impaired waters monitoring;
 - d. The control measures are not stringent enough for the discharge to meet applicable water quality standards;
 - e. A required control measure was never installed, was installed incorrectly, or is not being properly operated or maintained; or
 - f. Whenever a visual assessment shows evidence of stormwater pollution (*e.g.*, color, odor, floating solids, settled solids, suspended solids, foam).

Part IV. Requirements (cont'd)

9. Corrective Actions and Deadlines.

- a. **Immediate actions.** If corrective action is needed, the permittee must immediately take all reasonable steps necessary to minimize or prevent the discharge of pollutants until a permanent solution is installed and made operational, including cleaning up any contaminated surfaces so that the material will not discharge in subsequent storm events.

Note: In this context, the term “immediately” requires the permittee to, on the same day a condition requiring corrective action is found, take all reasonable steps to minimize or prevent the discharge of pollutants until a permanent solution is installed and made operational. However, if a problem is identified at a time in the work day when it is too late to initiate corrective action, the initiation of corrective action must begin no later than the following work day. “All reasonable steps” means that the permittee has undertaken initial actions to assess and address the condition causing the corrective action, including, for example, cleaning up any exposed materials that may be discharged in a storm event (e.g., through sweeping, vacuuming) or making arrangements (i.e., scheduling) for a new BMP to be installed at a later date. “All reasonable steps” for purposes of complying with Conditions Requiring SWPPP Review to Determine if Modifications Are Necessary, when the permittee concludes a corrective action is, in fact, not necessary, could include documenting why a corrective action is unnecessary.

- b. **Subsequent actions.** If the permittee determines that additional actions are necessary beyond those implemented in accordance with immediate action response, the permittee must complete the corrective actions (e.g., install a new or modified control and make it operational, complete the repair) before the next storm event if possible, and within 14 calendar days from the time of discovery of the corrective action condition. If it is infeasible to complete the corrective action within 14 calendar days, the permittee must document why it is infeasible to complete the corrective action within the 14-day timeframe. The permittee must also identify the schedule for completing the work, which must be done as soon as practicable after the 14-day timeframe but no longer than 45 days after discovery. If the completion of corrective action will exceed the 45-day timeframe, the permittee may take the minimum additional time necessary to complete the corrective action, provided that the permittee notifies the Department of the intention to exceed 45 days, the permittee’s rationale for an extension, and a completion date, which the permittee must also include in its corrective action documentation. Where the permittee’s corrective actions result in changes to any of the controls or procedures documented in your SWPPP, the permittee must modify the SWPPP accordingly within 14 calendar days of completing corrective action work.

Part IV. Requirements (cont'd)

- c. **Corrective Action Report (CAR).** A Corrective Action Report is a signed, certified report to document actions taken in response to triggering the need for corrective action. The existence of any of the conditions listed in Part IV(8)(a-f) of this GP triggers the need for corrective action review.

A complete CAR must contain the following information:

1. The existence of any of the conditions listed in Part IV(8)(a-f) of this GP and description of the condition triggering the need for corrective action review;
 2. For any spills or leaks: a description of the incident including material, date/time, amount, location, and cause for spill, and any leaks, spills or other releases that resulted in discharges of pollutants to the MS4 or waters of State, through stormwater or otherwise;
 3. Date the condition was identified in a facility or Department inspection;
 4. Description of immediate actions completed, including measures taken to prevent the reoccurrence of such releases;
 5. A description of the corrective actions taken or to be taken as a result of the identified conditions; and
 6. The dates when each corrective action was initiated and completed (or is expected to be completed).
- d. **Effect of corrective action.** If the event triggering the review is a violation of this GP correcting it does not remove the original violation. Additionally, failing to take corrective action in accordance with this section is an additional violation of this GP.

D. Sharing responsibility

1. **Reliance on other entity.** The permittee may satisfy the requirement to implement a BMP for a MCM by having a third party implement the BMP. For example, if a local watershed organization organized or funded by the permittee performs an annual “river clean-up”, this event may be used to satisfy a BMP for the Public Participation.

If the permittee is relying on a third party to implement one or more BMP(s), the permittee must note that fact in the SWMP and Annual Compliance Report required in Part IV (F). If the third party fails to implement the BMP(s), the permittee remains responsible for its implementation.

2. **Qualifying state or federal program.** If a BMP or MCM is the responsibility of a third party under another NPDES or MEPDES permit, the permittee is not required to include such BMP or MCM in its SWMP. The permittee must reference this qualifying program in their SWMP. However, the permittee is responsible for its implementation if the third party fails to perform. The permittee must annually confirm that the third party is still implementing this measure. If the third party fails to implement the measure, the SWMP must be modified to address the measure.

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Part IV. Requirements (cont'd)

In the case of a permitted industrial activity covered by the Multi Sector General Permit For The Discharge of Stormwater Associated With An Industrial Activity (MSGP), the permittee may reference the industrial activity's SWPPP to address a portion of the permittee's SWMP.

3. **Other MS4 Permittees.** The permittee must identify interconnections within the regulated small MS4s and find ways to cooperate with other regulated or non-regulated entities. Where a portion of the separate storm sewer system within a state/federal facility is owned, operated or otherwise the responsibility of another regulated small MS4, the two entities may coordinate the development and implementation of their respective SWMP to address all elements of Part IV B (1-6). At the very least, a clear description of their respective responsibilities for these elements must be included in each regulated small MS4's SWMP.

For example, a storm sewer system within a municipality may be operated and maintained by the Maine DOT, or other public or quasi-public entity. In cases such as these, the two entities must cooperate and coordinate their SWMP to reduce duplicative efforts to address the MCMs, particularly at the interconnections within storm sewer systems. Where an illicit discharge is detected from an outfall near an interface between two storm sewer systems and where there is more than one responsible entity, the two entities must coordinate their efforts to detect and ultimately eliminate the cause of the illicit discharge. These efforts must be noted in both the regulated small MS4's Annual Compliance Reports.

E. Discharges To Impaired Waters

1. If the waterbody to which a point source discharge drains is impaired and has an EPA approved total maximum daily load (TMDL), then the SWMP must propose clear, specific and measurable actions to comply with the TMDL waste load allocation ("WLA") and any implementation plan. This GP does not authorize a direct discharge that is inconsistent with the WLA of an approved TMDL. EPA approved TMDLs prior to the issuance date of this permit, can be found at <https://www.epa.gov/tmdl/region-1-approved-tmdls-state#tmdl-me>. This GP does not authorize a new or increased discharge of storm water to an impaired waterbody that contributes to the impairment at a detectable level.
2. If a TMDL is approved or modified by EPA subsequent to the issuance date of this GP, the Department will notify the permittee and may:
 - a. Require the permittee to review its permittee specific DEP Order and SWMP for consistency with the TMDL, and propose any necessary changes to the permittee specific DEP Order and SWMP to be submitted to the Department within six months of the receipt of notification concerning the TMDL;
 - b. Issue a watershed-specific general permit for the area draining to the impaired waterbody; or
 - c. Require the permittee to apply to the Department for an individual permit.

PERMIT

Part IV. Requirements (cont'd)

This GP will not be reopened for modification to address a TMDL that is approved or modified by EPA subsequent to the issuance date of this GP. The Department may however, after proper notice to the permittee, modify the terms and conditions of the permittee specific DEP Order to be consistent with the newly approved or modified TMDL. Modification of the permittee specific DEP Order will be subject to public process as described in Part III A(1).

3. If the waterbody to which a point source covered by this GP discharges is an Urban Impaired Stream (UIS) (Attachment B of this permit) the permittee must propose and fully implement at least three structural or non-structural BMPs or equivalent measures to be considered for inclusion in the permittee specific DEP Order, unless the Department has determined the MS4 discharge is not causing or contributing to the impairment. The BMPs must address a specific impairment from the MS4 discharge within the UA, be clear, specific and measurable. Structural or nonstructural BMPs may selected from a) MCMs 1-6, b) an existing Department approved Watershed Management Plan, or c) BMPs in Attachment D, *BMPs for Discharges to Urban Impaired Streams*, of this GP or more specifically developed by the permittee. For receiving waters impaired in whole or in part by nutrient loading, including UISs covered by the Impervious Cover TMDL, permittees may propose measures designed to reduce loads into the MS4 system. The permittee specific DEP Order will set forth those measures the permittee must take, and may include, in whole or in part, the measures proposed by the permittee.

F. Record Keeping

The permittee must keep all records required by this GP for at least three (3) years following its expiration or longer if requested by the Department or the USEPA. The permittee must make records, including its SWMP, available to the public during regular business hours.

G. Annual Compliance Report

By September 15 of each year, the permittee must electronically submit an Annual Compliance Report to the Department for review. Standardized Annual Compliance Report forms are to be provided by the Department or the permittee may submit an alternative form to the Department for review and approval.

MS4 Program Manager
Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017
e-mail: gregg.wood@maine.gov.

PERMIT

Part IV. Requirements (cont'd)

The Annual Compliance Report must include the following.

- a. The status of compliance with the terms and conditions of this GP and permittee specific DEP Order based on the implementation of the permittee's SWMP for each permit year, an assessment of the effectiveness of the components of its stormwater management program, an assessment of the appropriateness of identified BMPs, progress towards achieving identified measurable goals for each of the MCMs and progress toward achieving the goal of reducing the discharge of pollutants to the MEP.
- b. A summary of information collected and analyzed, including monitoring data, if any, during the reporting period.
- c. A summary of the stormwater activities the permittee intends to undertake pursuant to its SWMP to comply with the terms and conditions of this GP and permittee specific DEP Order during the next reporting cycle.
- d. A change in any identified BMPs or measurable goals that apply to the SWMP.
- e. A description of the activities, progress, and accomplishments for each of the MCMs #1 through #6 including such items as the status of education and outreach efforts, public involvement activities, stormwater mapping efforts, the number of visual dry weather inspections performed, the number of inaccessible and new outfalls, dry weather flow sampling events and laboratory results, detected illicit discharges, detected illicit connections, illicit discharges that were eliminated, construction site inspections, number and nature of enforcement actions, post construction BMP status and inspections, the number of functioning post construction BMPs, the number of post construction sites requiring maintenance or remedial action, the status of the permittee's good housekeeping/pollution prevention program including the percentage of catch basins cleaned, those catch basins cleaned multiple times and the number of catch basins that could not be evaluated for structural condition in a safe manner. Where applicable, the MS4 must quantify steps/measures/activities taken to comply with this GP and its SWMP including reporting on the types of trainings presented, the number of facility and contract staff that received training, the length of the training and training content delivered as well as any revisions to the SWPPP procedures and/or changes in facility operations.

Changes to the report based on the Department's review comment(s) must be submitted to the Department within 60 calendar days of the receipt of the comment(s).

Part IV. Requirements (cont'd)

H. Reopener. This GP may be modified or reopened by the Department, after providing notice to the permittees, as provided in Water Pollution Control, 38 M.R.S. § 414-A(5) as follows:

1. When necessary to correct legal, technical or procedural mistakes or errors;
2. When there has been or will be a substantial change in the activity or means of treatment that occurred after the time the permit was issued;
3. When new information other than revised rules, guidance or test methods becomes available that would have justified different conditions at the time the permit was issued;
4. When a pollutant not included in the permit may be present in the discharge in quantities sufficient to require treatment, such as when the pollutant exceeds the level that can be achieved by the technology-based treatment standards appropriate to the permittee or contribute to water quality violations; or
5. When necessary to make changes as a result of the failure of one state to notify another state whose waters may be affected by a discharge.

I. Narrative Discharge Limitations

1. Discharges must not contain a visible oil sheen, foam or floating solids at any time which would impair the usages designated for the classification of the receiving waters.
2. Discharges must not contain materials in concentrations or combinations which are hazardous or toxic to aquatic life, or which would impair the usages designated for the classification of the receiving waters.
3. Discharges must not impart visible discoloration, taste, turbidity, toxicity, radioactivity or other properties in the receiving waters which would impair the usages designated for the classification of the receiving waters.
4. Notwithstanding specific conditions of this permit, discharges must not lower the quality of any classified body of water below such classification, or lower the existing quality of any body of water if the existing quality is higher than the classification.

J. Severability

In the event that any provision(s), or part thereof, of this permit is declared to be unlawful by a reviewing court, the remainder of the permit shall remain in full force and effect, and shall be construed and enforced in all aspects as if such unlawful provision, or part thereof, had been omitted, unless otherwise ordered by the court.

ATTACHMENT A1

Regulated Small MS4 Municipal Operators

Auburn
Bangor
Berwick
Biddeford
Brewer
Cape Elizabeth
Cumberland
Eliot
Falmouth
Freeport
Gorham
Hampden
Kittery
Lewiston
Lisbon
Milford
Old Orchard Beach
Old Town
Orono
Portland
Sabattus
Saco
Scarborough
South Berwick
South Portland
Veazie
Westbrook
Windham
Yarmouth
York

ATTACHMENT A2

1. Portsmouth Naval Shipyard
2. Southern Maine Community College
3. University of Maine Augusta – Bangor Campus
4. Eastern Maine Community College
5. University of Southern Maine
6. University of Maine, Orono
7. Maine Air National Guard, Bangor
8. Dorothea Dix Psychiatric Center

ATTACHMENT B

Urban impaired streams

STREAM	TOWN*
LOGAN BROOK	AUBURN**
UNNAMED TRIBUTARY TO BOND BROOK (entering below I-95, drains Turnpike Mall Shopping Center)	AUGUSTA
KENNEDY BROOK	AUGUSTA
WHITNEY BROOK	AUGUSTA
PENJAJAWOC STREAM, including MEADOW BROOK	BANGOR**
BIRCH STREAM (OHIO STREET)	BANGOR**
CAPEHART BROOK	BANGOR**
ARCTIC BROOK (VALLEY AVENUE)	BANGOR**
SHAW BROOK	BANGOR**, HAMPDEN**
SUCKER BROOK	BANGOR**, HAMPDEN**
THATCHER BROOK	BIDDEFORD**
MARE BROOK	BRUNSWICK
UNNAMED TRIBUTARY TO ANDROSCOGGIN RIVER (near Jordan Avenue)	BRUNSWICK
UNNAMED TRIBUTARY TO ANDROSCOGGIN RIVER (near River Road)	BRUNSWICK
UNNAMED TRIBUTARY TO ANDROSCOGGIN RIVER (near Water Street)	BRUNSWICK
CARIBOU STREAM	CARIBOU
FROST GULLY BROOK	FREEPORT**
CONCORD GULLY	FREEPORT**
HART BROOK	LEWISTON**
JEPSON BROOK	LEWISTON**
UNNAMED STREAM (Route 196)	LISBON FALLS**
CAPISIC BROOK	PORTLAND**
DOLE BROOK	PORTLAND**
FALL BROOK	PORTLAND**
NASONS BROOK	PORTLAND**
GOOSEFARE BROOK	SACO**
GOODALL BROOK	SANFORD
TROUT BROOK (including KIMBALL BROOK)	SOUTH PORTLAND**
BARBERRY CREEK	SOUTH PORTLAND**
LONG CREEK	SOUTH PORTLAND**
PHILLIPS BROOK	SCARBOROUGH **
RED BROOK	SCARBOROUGH **, SOUTH PORTLAND**

WHITTEN BROOK	SKOWHEGAN
UNNAMED TRIBUTARY TO ANDROSCOGGIN RIVER (near Topsham Fairgrounds)	TOPSHAM
UNNAMED TRIBUTARY TO ANDROSCOGGIN RIVER (draining Topsham Fair Mall area)	TOPSHAM

*Town listed provides the general location of the stream. The stream may pass through other municipalities, which are also included even if not listed in this table.

** Town is regulated by the municipal MS4 GP.

ATTACHMENT C

Erosion and sedimentation control

A person who conducts, or causes to be conducted, an activity that involves filling, displacing or exposing soil or other earthen materials shall take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource as defined in 38 M.R.S. §480-B. Erosion control measures must be in place before the activity begins. Measures must remain in place and functional until the site is permanently stabilized. Adequate and timely temporary and permanent stabilization measures must be taken.

NOTE: Other requirements may apply, including, but not limited to the *Natural Resources Protection Act* 38 M.R.S. §480-B.

NOTE: The Department has prepared protocols for the control of erosion and sedimentation. See "Maine Erosion and Sediment Control BMPs Maine Department of Environmental Protection."

- 1. Pollution prevention.** Minimize disturbed areas and protect natural downgradient buffer areas to the extent practicable. Control stormwater volume and velocity within the site to minimize soil erosion. Minimize the disturbance of steep slopes. Control stormwater discharges, including both peak flow rates and volume, to minimize erosion at outlets. The discharge may not result in erosion of any open drainage channels, swales, stream channels or stream banks, upland, or coastal or freshwater wetlands off the project site.

Whenever practicable, no disturbance activities should take place within 50 feet of any protected natural resource. If disturbance activities take place between 30 feet and 50 feet of any protected natural resource, and stormwater discharges through the disturbed areas toward the protected natural resource, perimeter erosion controls must be doubled. If disturbance activities take place less than 30 feet from any protected natural resource, and stormwater discharges through the disturbed areas toward the protected natural resource, perimeter erosion controls must be doubled and disturbed areas must be temporarily or permanently stabilized within 7 days.

NOTE: Buffers improve water quality by helping to filter pollutants in run-off both during and after construction. Minimizing disturbed areas through phasing limits the amount of exposed soil on the site through retention of natural cover and by retiring areas as permanently stabilized. Less exposed soil results in fewer erosion controls to install and maintain. If work within an area is not anticipated to begin within two weeks' time, consider leaving the area in its naturally existing cover.

NOTE: Many construction activities within 75 feet of a protected natural resource require a permit under the *Natural Resources Protection Act* prior to initiation. For more information regarding the applicability of the NRPA to your project, you can visit the Department's website at <http://www.maine.gov/dep/land/nrpa/index.html> or contact staff of the Division of Land Resource Regulation at the nearest regional office.

- 2. Sediment barriers.** Prior to construction, properly install sediment barriers at the downgradient edge of any area to be disturbed and adjacent to any drainage channels within the disturbed area. Sediment barriers should be installed downgradient of soil or sediment stockpiles and stormwater prevented from running onto the stockpile. Maintain the sediment barriers by removing accumulated sediment, or removing and replacing the barrier, until the disturbed area is permanently stabilized. Where a
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discharge to a storm drain inlet occurs, if the storm drain carries water directly to a surface water and you have authority to access the storm drain inlet, you must install and maintain protection measures that remove sediment from the discharge.

3. **Stabilized construction entrance.** Prior to construction, properly install a stabilized construction entrance (SCE) at all points of egress from the site. The SCE is a stabilized pad of aggregate, underlain by a geotextile filter fabric, used to prevent traffic from tracking material away from the site onto public ROWs. Maintain the SCE until all disturbed areas are stabilized.
4. **Temporary stabilization.** Within 7 days of the cessation of construction activities in an area that will not be worked for more than 7 days, stabilize any exposed soil with mulch, or other non-erodible cover. Stabilize areas within 75 feet of a wetland or waterbody within 48 hours of the initial disturbance of the soil or prior to any storm event, whichever comes first.
5. **Removal of temporary measures.** Remove any temporary control measures, such as silt fence, within 30 days after permanent stabilization is attained. Remove any accumulated sediments and stabilize.

NOTE: It is recommended that silt fences be removed by cutting the fence materials at ground level to avoid additional soil disturbance.

6. **Permanent stabilization.** If the area will not be worked for more than one year or has been brought to final grade, then permanently stabilize the area within 7 days by planting vegetation, seeding, sod, or through the use of permanent mulch, or riprap, or road sub-base. If using vegetation for stabilization, select the proper vegetation for the light, moisture, and soil conditions; amend areas of disturbed subsoils with topsoil, compost, or fertilizers; protect seeded areas with mulch or, if necessary, erosion control blankets; and schedule sodding, planting, and seeding so to avoid die-off from summer drought and fall frosts. Newly seeded or sodded areas must be protected from vehicle traffic, excessive pedestrian traffic, and concentrated runoff until the vegetation is well-established with 90% cover by healthy vegetation. If necessary, areas must be reworked and restabilized if germination is sparse, plant coverage is spotty, or topsoil erosion is evident. One or more of the following may apply to a particular site.
 - (a) **Seeded areas.** For seeded areas, permanent stabilization means a 90% cover of the disturbed area with mature, healthy plants with no evidence of washing or rilling of the topsoil.
 - (b) **Sodded areas.** For sodded areas, permanent stabilization means the complete binding of the sod roots into the underlying soil with no slumping of the sod or die-off.
 - (c) **Permanent Mulch.** For mulched areas, permanent mulching means total coverage of the exposed area with an approved mulch material. Erosion Control Mix may be used as mulch for permanent stabilization according to the approved application rates and limitations.
 - (d) **Riprap.** For areas stabilized with riprap, permanent stabilization means that slopes stabilized with riprap have an appropriate backing of a well-graded gravel or approved geotextile to prevent soil movement from behind the riprap. Stone must be sized appropriately. It is recommended that angular stone be used.

- (e) **Agricultural use.** For construction projects on land used for agricultural purposes (e.g., pipelines across crop land), permanent stabilization may be accomplished by returning the disturbed land to agricultural use.
 - (f) **Paved areas.** For paved areas, permanent stabilization means the placement of the compacted gravel subbase is completed, provided it is free of fine materials that may runoff with a rain event
 - (g) **Ditches, channels, and swales.** For open channels, permanent stabilization means the channel is stabilized with a 90% cover of healthy vegetation, with a well-graded riprap lining, turf reinforcement mat, or with another non-erosive lining such as concrete or asphalt pavement. There must be no evidence of slumping of the channel lining, undercutting of the channel banks, or down-cutting of the channel.
7. **Winter Construction.** "Winter construction" is construction activity performed during the period from November 1 through April 15. If disturbed areas are not stabilized with permanent measures by November 1 or new soil disturbance occurs after November 1, but before April 15, then these areas must be protected and runoff from them must be controlled by additional measures and restrictions.
- (a) **Site Stabilization.** For winter stabilization, hay mulch is applied at twice the standard temporary stabilization rate. At the end of each construction day, areas that have been brought to final grade must be stabilized. Mulch may not be spread on top of snow.
 - (b) **Sediment Barriers.** All areas within 75 feet of a protected natural resource must be protected with a double row of sediment barriers.
 - (c) **Ditch.** All vegetated ditch lines that have not been stabilized by November 1, or will be worked during the winter construction period, must be stabilized with an appropriate stone lining backed by an appropriate gravel bed or geotextile unless specifically released from this standard by the Department.
 - (d) **Slopes.** Mulch netting must be used to anchor mulch on all slopes greater than 8% unless erosion control blankets or erosion control mix is being used on these slopes.

NOTE: The Department has prepared protocols for the control of erosion and sedimentation during the winter months. See "Maine Erosion and Sediment Control BMPs Maine Department of Environmental Protection."

8. **Stormwater channels.** Ditches, swales, and other open stormwater channels must be designed, constructed, and stabilized using measures that achieve long-term erosion control. Ditches, swales and other open stormwater channels must be sized to handle, at a minimum, the expected volume runoff. Each channel should be constructed in sections so that the section's grading, shaping, and installation of the permanent lining can be completed the same day. If a channel's final grading or lining installation must be delayed, then diversion berms must be used to divert stormwater away from the channel, properly-spaced check dams must be installed in the channel to slow the water velocity, and a temporary lining installed along the channel to prevent scouring. Permanent stabilization for channels is addressed under Appendix A(5)(g) above.
- (a) The channel should receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side slopes.
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- (b) When the watershed draining to a ditch or swale is less than 1 acre of total drainage and less than $\frac{1}{4}$ acre of impervious area, diversion of runoff to adjacent wooded or otherwise vegetated buffer areas is encouraged where the opportunity exists.

9. **Sediment basins.** Sediment basins must be designed to provide storage for either the calculated runoff from a 2-year, 24-hour storm or provide for 3,600 cubic feet of capacity per acre draining to the basin. Outlet structures must discharge water from the surface of the basin whenever possible. Erosion controls and velocity dissipation devices must be used if the discharging waters are likely to create erosion. Accumulated sediment must be removed as needed from the basin to maintain at least $\frac{1}{2}$ of the design capacity of the basin.

The use of cationic treatment chemicals, such as polymers, flocculants, or other chemicals that contain an overall positive charge designed to reduce turbidity in stormwater must receive prior approval from the Department. When requesting approval to use cationic treatment chemicals, you must describe appropriate controls and implementation procedures to ensure the use will not lead to a violation of water quality standards. In addition, you must specify the type(s) of soil likely to be treated on the site, chemicals to be used and how they are to be applied and in what quantity, any manufacturer's recommendations, and any training had by personnel who will handle and apply the chemicals.

10. **Roads.** Gravel and paved roads must be designed and constructed with crowns or other measures, such as water bars, to ensure that stormwater is delivered immediately to adjacent stable ditches, vegetated buffer areas, catch basin inlets, or street gutters.

NOTE: (1) Gravel and paved roads should be maintained so that they continue to conform to this standard in order to prevent erosion problems. (2) The Department recommends that impervious surfaces, including roads, be designed and constructed so that stormwater is distributed in sheet flow to natural vegetated buffer areas wherever such areas are available. Road ditches should be designed so that stormwater is frequently (at least every 100 to 200 feet) discharged via ditch turnouts in sheet flow to adjacent natural buffer areas wherever possible.

11. **Culverts.** Culverts must be sized to avoid unintended flooding of upstream areas or frequent overtopping of roadways. Culvert inlets must be protected with appropriate materials for the expected entrance velocity, and protection must extend at least as high as the expected maximum elevation of storage behind the culvert. Culvert outlet design must incorporate measures, such as aprons, to prevent scour of the stream channel. Outlet protection measures must be designed to stay within the channel limits. The design must take account of tailwater depth.

12. **Parking areas.** Parking areas must be constructed to ensure runoff is delivered to adjacent swales, catch basins, curb gutters, or buffer areas without eroding areas downslope. The parking area's subbase compaction and grading must be done to ensure runoff is evenly distributed to adjacent buffers or side slopes. Catch basins must be located and set to provide enough storage depth at the inlet to allow inflow of peak runoff rates without by-pass of runoff to other areas.

13. **Additional requirements.** Additional requirements may be applied on a site-specific basis.
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Inspection and maintenance**1. During construction.** The following standards must be met during construction.

- (a) **Inspection and corrective action.** Inspect disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspect these areas at least once a week as well as before and within 24 hours after a storm event (rainfall), and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.
- (b) **Maintenance.** If best management practices (BMPs) need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If additional BMPs or significant repair of BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event (rainfall). All measures must be maintained in effective operating condition until areas are permanently stabilized.
- (c) **Documentation.** Keep a log (report) summarizing the inspections and any corrective action taken. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicles access points to the parcel. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and location(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.

The log must be made accessible to Department staff and a copy must be provided upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

2. Post-construction. The following standards must be met after construction.

- (a) **Plan.** Carry out an approved inspection and maintenance plan that is consistent with the minimum requirements of this section. The plan must address inspection and maintenance of the project's permanent erosion control measures and stormwater management system. This plan may be combined with the plan listed in Section 2(a) of this appendix. See Section 7(C)(2) for submission requirements.
 - (b) **Inspection and maintenance.** All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site. Inspection or maintenance tasks other than those discussed below must be included in the maintenance plan developed for a specific site.
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NOTE: Expanded and more-detailed descriptions for specific maintenance tasks may be found in the Maine DEP's "Stormwater Management for Maine: Best Management Practices."

- (i) Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows. See permanent stabilization standards in Appendix A(5).
 - (ii) Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after heavy rains to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or sideslopes.
 - (iii) Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.
 - (iv) Inspect and clean out catch basins. Clean-out must include the removal and legal disposal of any accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins. If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).
 - (v) Inspect resource and treatment buffers once a year for evidence of erosion, concentrating flow, and encroachment by development. If flows are concentrating within a buffer, site grading, level spreaders, or ditch turn-outs must be used to ensure a more even distribution of flow into a buffer. Check down slope of all spreaders and turn-outs for erosion. If erosion is present, adjust or modify the spreader's or turnout's lip to ensure a better distribution of flow into a buffer. Clean-out any accumulation of sediment within the spreader bays or turn-out pools.
 - (vi) Inspect at least once per year, each stormwater management pond or basin, including the pond's embankments, outlet structure, and emergency spillway. Remove and dispose of accumulated sediments in the pond. Control woody vegetation on the pond's embankments.
 - (vii) Inspect at least one per year, each underdrained filter, including the filter embankments, vegetation, underdrain piping, and overflow spillway. Remove and dispose of accumulated sediments in the filter. If needed, rehabilitate any clogged surface linings, and flush underdrain piping.
 - (viii) Inspect each manufactured system installed on the site, including the system's inlet, treatment chamber(s), and outlet at least once per year, or in accordance with the maintenance
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guidelines recommended by the manufacturer based on the estimated runoff and pollutant load expected to the system from the project. Remove and dispose of accumulated sediments, debris, and contaminated waters from the system and, if applicable, remove and replace any clogged or spent filter media.

(c) **Regular maintenance**

- (i) Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader. Grading of gravel roads, or grading of the gravel shoulders of gravel or paved roads, must be routinely performed to ensure that stormwater drains immediately off the road surface to adjacent buffer areas or stable ditches, and is not impeded by accumulations of graded material on the road shoulder or by excavation of false ditches in the shoulder. If water bars or open-top culverts are used to divert runoff from road surfaces, clean-out any sediments within or at the outlet of these structures to restore their function.
- (ii) Manage each buffer's vegetation consistently with the requirements in any deed restrictions for the buffer. Wooded buffers must remain fully wooded and have no disturbance to the duff layer. Vegetation in non-wooded buffers may not be cut more than three times per year, and may not be cut shorter than six inches.

NOTE: Contact the Department's Division of Watershed Management (Maine DEP) for assistance developing inspection and maintenance requirements for other drainage control and runoff treatment measures installed on the site. The maintenance needs for most measures may be found in the Maine DEP's "Stormwater Management for Maine: Best Management Practices."

- (d) **Documentation.** Keep a log (report) summarizing inspections, maintenance, and any corrective actions taken. The log must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal. The log must be made accessible to Department staff and a copy provided to the Department upon request. The permittee shall retain a copy of the log for a period of at least five years from the completion of permanent stabilization.
3. **Re-certification.** Submit a certification of the following to the Department within three months of the expiration of each five-year interval from the date of issuance of the permit.
- (a) **Identification and repair of erosion problems.** All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.
 - (b) **Inspection and repair of stormwater control system.** All aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system.
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- (c) **Maintenance.** The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the Department, and the maintenance log is being maintained.

Municipalities with separate storm sewer systems regulated under the Maine Pollutant Discharge Elimination System (MPDES) Program may report on all regulated systems under their control as part of their required annual reporting in lieu of separate certification of each system. Municipalities not regulated by the MPDES Program, but that are responsible for maintenance of permitted stormwater systems, may report on multiple stormwater systems in one report.

4. **Duration of maintenance.** Perform maintenance as described and required in the permit unless and until the system is formally accepted by the municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the Department stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with Department standards. Upon such assumption of responsibility, and approval by the Department, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.
5. **Additional requirements.** Additional requirements may be applied on a site-specific basis.
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Housekeeping

These performance standards apply to all projects except for stormwater PBR projects.

1. **Spill prevention.** Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop, and implement as necessary, appropriate spill prevention, containment, and response planning measures.

NOTE: Any spill or release of toxic or hazardous substances must be reported to the Department. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the Department's website at : <http://www.maine.gov/dep/spills/emergspillresp/>

2. **Groundwater protection.** During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area, in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.

See Appendix D for license by rule standards for infiltration of stormwater.

NOTE: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

3. **Fugitive sediment and dust.** Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately and no less than once a week and prior to significant storm events. Operations during dry months, that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

NOTE: Dewatering a stream without a permit from the Department may violate state water quality standards and the *Natural Resources Protection Act*.

4. **Debris and other materials.** Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

NOTE: To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable

provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. **Excavation de-watering.** Excavation de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department.

NOTE: Dewatering controls are discussed in the "Maine Erosion and Sediment Control BMPs, Maine Department of Environmental Protection."

6. **Authorized Non-stormwater discharges.** Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:
- (a) Discharges from firefighting activity;
 - (b) Fire hydrant flushings;
 - (c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
 - (d) Dust control runoff in accordance with permit conditions and Appendix (C)(3);
 - (e) Routine external building washdown, not including surface paint removal, that does not involve detergents;
 - (f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
 - (g) Uncontaminated air conditioning or compressor condensate;
 - (h) Uncontaminated groundwater or spring water;
 - (i) Foundation or footer drain-water where flows are not contaminated;
 - (j) Uncontaminated excavation dewatering (see requirements in Appendix C(5));
 - (k) Potable water sources including waterline flushings; and
 - (l) Landscape irrigation.
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DEPARTMENT OF ENVIRONMENTAL PROTECTION

7. **Unauthorized non-stormwater discharges.** The Department's approval under this Chapter does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges in compliance with Appendix C (6). Specifically, the Department's approval does not authorize discharges of the following:
- (a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
 - (b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
 - (c) Soaps, solvents, or detergents used in vehicle and equipment washing; and
 - (d) Toxic or hazardous substances from a spill or other release.
- (8) **Additional requirements.** Additional requirements may be applied on a site-specific basis.
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ATTACHMENT D

BMPs for Discharges to Urban Impaired Streams

Stormwater effects can be lessened, water quality improved, and impairments curtailed by implementing best management practices (BMPs) and remedial actions in a cost-effective manner using the following adaptive management approach:

- Implement BMPs strategically through a phased program which focuses on getting the most reductions, for least cost, in sensitive areas first (for example, begin with habitat restoration, flood plain recovery, and treatment of smaller, more frequent storms);
- Monitor ambient water quality to assess stream improvement;
- Compare monitoring results to water quality standards (aquatic life criteria);
- Continue BMP implementation in a phased manner until water quality standards are attained.

General Stream Restoration Techniques

Following is a list of general BMPs and stream restoration techniques and how they can alleviate stressors and improve stream health. Short-term implementation of these measures will complement the long-term strategy of disconnecting or removing impervious surfaces suggested above.

- Maintaining the riparian buffer composed of native plants, including mature trees. Enhancing or replanting the riparian buffer where it is inadequate. An adequate buffer will filter runoff from commercial and residential lots, improves shading (which helps to keep water temperature low), and increases large woody debris availability, and food input. It will also provide terrestrial and aquatic habitat for insects with aquatic life stages, thus enhancing recolonization potential of the macroinvertebrate community.
- Reclamation of flood plains by returning these areas to a natural state will naturally moderate floods; reduce stress on the stream channel; provide habitat for fish, wildlife, and plant resources; promote groundwater recharge; and help maintain water quality. Protection of intact flood plains should be a high priority.
- Improving channel morphology (restoring sinuosity, pool availability and diversity, and flow diversity) by installing double wing deflectors and low crib walls in the stream will improve flow conditions and habitat for macroinvertebrates. Because of the complex nature of channel restoration, any improvement activity will require the extensive involvement of a trained professional.
- Reducing erosion from land use activities with mulches, grass covers, geotextiles or riprap will reduce excess sedimentation. In stream bank stabilization projects, use of woody vegetation is preferred over riprap in most cases.

General Stream Restoration Techniques (cont'd)

- Reducing the input of winter road sand and road dirt by sweeping roads, parking areas or driveways will reduce excess sedimentation.
- Reducing the incidence of spills (accidental and deliberate) for example by improving education and training will reduce toxic contaminant input.
- Minimizing waste input from pets by picking up waste will reduce bacteria and nutrient input.
- Eliminating the potential for sewer/septic system leaks by regularly inspecting and maintaining sewer/septic systems will reduce toxic contaminant and nutrient input.
- Eliminating illicit discharges by detecting and eliminating discharges will reduce toxic contaminant and nutrient input.
- Minimizing lawn/landscaping runoff by minimizing fertilizer/pesticide use and using more efficient application methods will reduce nutrient and toxic contaminant input.
- Reducing the temperature of water discharged from a detention structure by redesigning and retrofitting existing detention with outlet structures (e.g., underdrains) that cool the discharge will reduce negative temperature effects on the stream.
- Investing in education and outreach efforts will raise public awareness for the connections between urbanization, impervious cover, stormwater runoff, and overall stream health.
- Encouraging responsible development by promoting Smart Growth or Low-Impact Development guidelines and the use of pervious pavement techniques will minimize overall effects of urbanization.
- Reducing new impervious cover by promoting shared parking areas between homes or between facilities that require parking at different times will reduce impacts related to impervious surfaces. Lowering minimum parking requirements for businesses and critically assessing the need for new impervious surfaces will have the same effect.
- Eliminating septic systems in the watershed by expanding the municipal sewer system will reduce toxic contaminant and nutrient input.
- Discouraging the use of pavement sealants on driveways and parking lots will reduce the input of toxic contaminants. A recent study showed that runoff from sealed parking lots could account for the majority of the PAH load in urban streams. PAHs are a group of toxic contaminants with known negative effects on aquatic communities. Sealants are often applied for aesthetic reasons only, and decreasing their use represents a simple way to reduce the toxics load in runoff.
- Performing regular maintenance on detention ponds will reduce export of accumulated sediment and nutrients into the stream during large storms.

Disconnection of Impervious Surfaces

The purpose here is to prevent stormwater runoff from reaching the stream directly (via the storm drain system), thus reducing % IC. There are various options for achieving this goal:

- Channel runoff from large parking lots, roads or highways into;
 - o detention/retention BMPs (e.g., dry/wet pond, extended detention pond, created wetland), preferably one equipped with a treatment system (e.g., underdrains);
 - o vegetative BMPs (e.g., vegetated buffers or swales);
 - o infiltration BMPs (e.g., dry wells, infiltration trenches/basins, bio-islands/cells);
 - o underdrained soil filters (e.g., bioretention cells, dry swales).
- Redesign and retrofit existing detention to provide extended detention for 6 month and 1 year storms.
- Guide runoff from paved driveways and roofs towards pervious areas (grass, driveway drainage strip, decorative planters, rain gardens).
- Remove curbs on roads or parking lots.
- Collect roof runoff in rain barrels and discharge into pervious areas.

All of these options for disconnection of impervious surfaces provide for a virtual elimination of runoff during light rains (which account for the majority of runoff events but not the majority of pollutant or stormwater input), reduction in peak discharge rate and volume during heavy rains, sedimentation or filtration of some pollutants, and improvement in groundwater recharge. Disconnection of impervious surfaces can often be achieved at reasonable cost and, unlike the removal of impervious surfaces (below), does not generally create material for disposal. These BMPs cover most sizes of impervious surfaces (private driveways and small building roofs to large parking lots and highways), and many have been widely used in cold climates. Disconnection of impervious surfaces is a particularly useful option in watersheds with relatively high imperviousness.

Conversion of Impervious Surfaces

This is achieved by replacing impervious surfaces with pervious surfaces, for example by using the following BMPs:

- Replace asphalt on little-used parking lots, driveways or other areas with light vehicular traffic with porous pavement blocks or grass/gravel pave.
- Replace small areas of asphalt on large parking lots with bioretention structures (bioislands/cells).
- Replace existing parking lot expanses with more space-efficient multistory parking garages (i.e., go vertical).
- Replace conventional roofs with green roofs.

These options for conversion of impervious surfaces also provide for a virtual elimination of runoff during light rains (which account for the majority of runoff events), reduction in peak discharge rate and volume during heavy rains, filtration of some pollutants, and improvement in groundwater recharge.

Structural and Non-Structural BMPs for Watersheds with Chloride as Stressor

- Follow or require the use of BMPs for snow and ice control product selection, application processes, application equipment, loading and washing, per the Maine Environmental Best Management Practices Manual for Snow and Ice Control (2015). Cover sand/salt piles and manage loading area to reduce runoff from becoming contaminated with salt.
- Develop, or require the development of a salt management plan, to ensure BMPs are used, and only areas that truly need to be salted are. Consider whether all the impervious area needs to be plowed and salted, or if some of the area could be out of service for the winter. For instance, after the busy holiday season, consider only plowing the area of a commercial parking lot that is actually used during that time period.
- For developments currently being planned, consider reducing the number of parking spaces and/or reducing road widths. If there are municipal requirements, consider revising those requirements to allow for less parking spaces or smaller road widths in certain areas.
- Reduce infiltration of salty water in vulnerable areas. While stormwater BMPs that infiltrate, or simply allowing stormwater to infiltrate, are recommended for treating nutrients, metals, and other pollutants, when chloride impact to a small stream is the biggest current or future concern, infiltration is discouraged.

- Don't infiltrate salty water if possible. For instance, don't plow onto pervious areas, and capture salty runoff so it goes to the stormwater system. Since stormwater systems can often have leaks which would allow salty water to exfiltrate into the groundwater, ensure stormwater system in vulnerable areas is secure. Stormwater ponds should be lined so the salty water doesn't infiltrate.
- Infiltrate clean, non-salty water (e.g. roof runoff) since infiltration is still a good practice if the water is not salty. The non-salty water will help flush the groundwater, and any contaminated water with it. It also will not be adding to the volume of salt-laden water that needs to be managed.
- For new development being planned, don't allow or encourage (through infiltration BMPs) future infiltration of areas likely to be salted.
- Install solar parking canopies - The canopy provides protection from the elements (and therefore reduction of salt use) and shaded parking in summer, along with the benefit of producing energy.
- Install heated sidewalks or roads to reduce the need for shoveling and salt.

ATTACHMENT E



Standard Operating Procedure
Bureau of Water Quality Date: April
20, 2006
Revised: June 12, 2017
Doc num: DEPLW0768

**Bureau of Water Quality
Division of Water Quality Management
Industrial Stormwater Program**

Standard Operating Procedures and Visual Monitoring Guidelines
for Stormwater Discharges Associated With Industrial Activities.

1. **APPLICABILITY.** This Standard Operating Procedure (SOP) applies to all industrial facilities covered under Maine's Multi-Sector General Permit (MSGP) for Stormwater Discharges Associated with Industrial Activity. Permitted facilities are required to perform quarterly visual monitoring of their stormwater discharges and record and maintain the results in the facility's Stormwater Pollution Prevention Plans (SWPPP).

Monitoring requirements are not required for entities that are participating in a Watershed Management Plan. The Long Creek Watershed Management Plan in the municipalities of South Portland, Portland, Westbrook and Scarborough is a Department Approved Watershed Management Plan. In addition, the requirements for visual monitoring does not apply at a facility that is inactive and unstaffed, provided that there are no industrial materials or activities exposed to stormwater. To invoke this exception, the permittee must maintain a signed and certified statement with the facility SWPPP stating that the site is inactive and unstaffed, and that there is no exposure to stormwater.

2. **PURPOSE.** This document provides guidelines for standardized collection and visual examination of quarterly visual monitoring samples for indicators of stormwater pollution as defined in Special Condition N. of the MSGP and to provide guidelines describing standardized methods of data recording and record keeping of all quarterly visual stormwater discharge monitoring data as described in Special Condition N. of the MSGP.

3. **DEFINITIONS.**

- 3.1. **MULTI-SECTOR GENERAL PERMIT (MSGP).** A general permit for Stormwater Discharges Associated with Industrial Activity. Authorizes the direct discharge or point source discharge of stormwater associated with industrial activity to waters of the State (other than groundwater) or to an MS4 (which discharges to waters of the State), provided the discharge meets the requirements stated in this permit. This permit is effective March 7, 2017 and expires March 7, 2022. It replaces Maine's 2011 MSGP for Industrial Activity issued April 26, 2011.
- 3.2. **SWPPP.** Stormwater Pollution Prevention Plan. A written plan developed and implemented by each permitted facility to reduce or eliminate pollutants which come in contact with stormwater associated with industrial activity. This plan outlines sources of potential stormwater pollutants and the methods by which these pollutants will be reduced or prevented from entering waters of the State.

Standard Operating Procedure Guidelines For Visual Monitoring of Stormwater Discharges Associated With Industrial Activities. Division of Water Quality Management, Industrial Stormwater Program



- 3.3. GRAB SAMPLE. A single sample or collection of stormwater taken during a qualifying storm event from a single stormwater outfall. The sample may be collected manually or with an automatic sampler.
- 3.4. OUTFALL. The location where collected and concentrated stormwater flows are discharged from the facility such that the first receiving waterbody into which the discharge flows, either directly or through a separate storm sewer system, is a water of the State.
- 3.5. QUALIFYING STORM EVENT. A storm event that is either precipitation, ice or snow melt that produces a measureable discharge of 0.1 inch or more in a 24-hour period at an outfall and occurs at least 72 hours from a previous qualifying storm event.

4. RESPONSIBILITIES.

- 4.1. MONITORING PROGRAM IMPLEMENTATION. The visual monitoring schedule listed below in this section is also outlined in Maine's 2016 MSGP Special Condition N. Visual examinations must be clearly documented and maintained in the facility's SWPPP. The permittee shall perform and document a quarterly visual examination of industrial stormwater discharges from each outfall which discharges stormwater associated with industrial activity from the facility.
- 4.2. OUTFALL IDENTIFICATION. The permittee shall identify each industrial stormwater outfall at the facility. All outfalls must be clearly identified on the facility site map which is part of the facility's SWPPP and presented in the written text of the SWPPP.
- 4.3. REPRESENTATIVE OUTFALLS. "Representative outfalls" mean two or more outfalls with a single drainage area that are anticipated to discharge substantially similar pollutants resulting from substantially similar industrial activities, materials, or practices occurring within the outfalls' designated drainage area. If the facility contains representative outfalls, visual monitoring may be conducted at one of the outfalls during a given monitoring period provided that subsequent samples are taken from a different outfall within the representative outfalls' drainage area. The facility is not required to monitor more than one representative outfall within a designated drainage area per monitoring event as long as the site's SWPPP contains the required information as identified in Special Condition B(15) of the MSGP.
- 4.4. EMPLOYEE TRAINING. The permittee shall ensure that all facility personnel involved in stormwater sampling are properly trained. Staff involved in sampling shall:
 - a. Be familiar with the site map and outfall locations
 - b. Walk the site to physically identify each sampling location
 - c. Become familiar with local rainfall and drainage patterns
 - d. Become competent with proper sample collection procedures



Personnel involved in sampling should also be trained in all facility safety procedures as they apply to stormwater sampling. If possible, the same individual should carry out the collection and examination of discharges for the entire permit term. Written documentation signed by a qualified person certifying that all personnel involved in sampling have been properly trained should be documented in the SWPPP.

4.5. **SAMPLE COLLECTION FREQUENCY.** Visual examination of industrial stormwater discharges must be performed once per monitoring quarter. If a qualifying storm event does not occur at the facility for a particular monitoring quarter, the permittee is excused from visual monitoring for that quarter, provided the permittee documents in the monitoring records that no qualifying event occurred. The Visual Monitoring Form shall be used to document both qualifying and non-qualifying storm events. Schedule of monitoring quarters is listed below.

- First: January 1 – March 31
- Second: April 1 – June 30
- Third: July 1 – September 30
- Fourth: October 1 – December 31

All other time specific sampling requirements are to be performed in accordance with the parameters outlined in the procedures section of this document.

4.6. **RECORD KEEPING AND REPORTING.** The permittee shall maintain all visual monitoring reports/records onsite with the SWPPP. The permittee is not required to submit visual monitoring results to DEP unless specifically requested to do so.. Requirements for recording visual examination data are outlined in the procedures section of this document.

5. PROCEDURES

5.1. **SAMPLE COLLECTION TIMING.** A grab sample must be collected from each facility outfall (except representative outfalls) once per quarter during a qualifying storm event. During a qualifying storm event, a grab sample for visual examination should be collected during the first 60 minutes or as soon thereafter, but must not to exceed 2.25 hours of when runoff begins discharging from an outfall. During monitoring quarters when snow or icemelt represents the only stormwater discharge, a grab sample must also be collected during periods of significant snow or ice melt within the first 60 minutes or as soon thereafter, but not to exceed 2.25 hours of when snow or icemelt begins discharging from an outfall. Stormwater runoff from employee parking lots, administration buildings, and landscaped areas that is not mixed with stormwater associated with industrial activity, or stormwater discharges to municipal sanitary sewers does not need to be sampled. Samples must be collected during daylight hours and normal operations.



- 5.2. **SAMPLE CONTAINER CLEANING AND PREPARATION.** The facility should have an adequate supply of containers prepared for collection of industrial stormwater samples from each outfall prior to collecting samples for visual examination. All sample containers used for sampling for visual examination should be certified as clean and free of residue. After each use and for cleaning the Imhoff Settling Cone or graduated beaker. A bottle brush will aid in removing any fine sediment trapped in the bottom point of the Imhoff cone:
- Wash containers in a non-phosphate detergent and tap water wash.
 - Thoroughly fill and rinse containers with tap water at least three (3) times.
 - Store containers closed, and in an area free of dust and other potential sample contaminants.
 - If additional containers are needed to collect samples from less accessible outfalls (e.g. buckets which are attached to poles for reaching outfalls), these containers should also be cleaned and prepared as indicated above.
- 5.3 **MANUAL GRAB SAMPLE COLLECTION.** Manual grab samples should be collected by inserting a container under or downstream of a discharge with the container opening facing upstream, and with the opening of the container completely immersed under water, whenever possible. A sample container at least 1000 ml should be used to collect the sample. In most cases the sample container can be held in hand while the sample is collected. Less accessible outfalls may require the use of poles and buckets to collect grab samples. Take the grab from the horizontal and vertical center of the outfall. If sampling in a channel, (e.g., ditch, trench, rill) avoid stirring up bottom sediments. Avoid touching the inside of the container to prevent contamination. Transfer sample to a clear glass or plastic container if using another container such as a bucket to collect a sample from a less accessible location. If taking samples from multiple outfalls, label containers with outfall identification prior to taking samples. Make sure samples are securely capped until examination.
- 5.4 **COLLECTION OF GRAB SAMPLES BY AUTOMATIC SAMPLER.** Facilities which use automatic samplers for stormwater sampling may collect grab samples for visual examination by this method. Programming for collecting grab samples is specific to the type of automatic sampler. All facility personnel who collect stormwater samples using automatic samplers should be properly trained in operation of the sampler before doing so. Several different types of automatic samplers are available for stormwater sampling. However, the following guidelines should be followed when sampling regardless of the type of sampler used. All equipment must be properly cleaned, particularly the tubing and sample containers. Deionized water should be drawn through the sampler to remove any residuals prior to taking samples. Tubing should also be periodically replaced to avoid algae or bacterial growth. Additionally, a distilled/deionized water blank



sample should be taken at each outfall sampled to determine if contamination of storm-water samples by the sampling equipment has occurred. Samplers should be used in exact accordance with the manufacturers' instructions. All sampler calibration and maintenance data should be kept on site with the SWPPP.

- 5.5 **SAMPLE EXAMINATION.** Visual examination of all grab samples collected must be performed within the first sixty (60) minutes. Bring the collected samples to a well lit indoor area. Pour each sample into a separate 1 L polycarbonate plastic graduated Imhoff settling cone or 1000 ml graduated cylinder. The Imhoff settling cone or beaker should have graduations that allow volume measurement to the nearest 10 milliliter. Record the total sample volume to the nearest milliliter on the visual monitoring form. Examine the samples for the following criteria according to the instructions provided with the visual monitoring form: Foam, odor, clarity, floating solids, suspended solids, color, oil sheen, settled solids, and any other obvious indicators of stormwater pollution. Read the settled solids 1 hour after pouring the sample into the cone, as this assures that all solids are settled out of the water. Settled solids in the bottom of the cone should be measured to the nearest milliliter.

*Note: Clear polycarbonate plastic Imhoff cones are available from several scientific supply companies. You may also purchase 1000 ml graduated beakers from various scientific supply companies.

- 5.6 **SAMPLE DATA RECORDING.** Record all sample data on the visual monitoring form after examining the sample for all of the criteria listed in the instructions. The form should include the examination date and time, examination personnel, the nature of the discharge (e.g., rain, snow or icemelt), identification of outfall sampled, quality of the stormwater discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and any other obvious indicators of stormwater pollution), and probable sources of any observed contamination including any corrective actions taken. The permittee must sign and certify the documentation in accordance with Standard Condition 2 of the Maine MSGP. All visual examination reports must be maintained with the facility SWPPP.

- 5.7 **RECOMMENDATIONS FOR SOLVING SAMPLE LOCATION PROBLEMS.** Consult guidelines listed below when it is necessary to sample an outfall located at a less than ideal location for sampling.

- **PROBLEM:** Sampling where stormwater comingles with process water or other non-stormwater discharge.

RECOMMENDATION: Attempt to sample the stormwater discharge before it mixes with the non-stormwater discharge. If this is impossible, sample the discharge and maintain a record of the visual examination data observed under both conditions on site with the



SWPPP. This will provide an indication of the contribution of any observable contamination from each source.

- **PROBLEM:** Numerous small point channels make up an outfall from which it is difficult to collect a sample.

RECOMMENDATION: Impound channels or join their flow together by building a weir or digging a ditch to collect discharge at a low point for sampling. This artificial collection point should be lined with plastic or filter fabric and stone to prevent infiltration and/or high levels of sediment.

- **PROBLEM:** Inaccessible discharge point. Examples include underwater discharges or unreachable discharges (e.g., out of a cliff, steep slope or bank of a stream).

RECOMMENDATION: Go up the pipe to sample (e.g., to the nearest manhole or inspection point). If these are not available, tap into the pipe, or sample at several locations upstream of the pipe if the pipe is the only outfall for the facility.

- **PROBLEM:** Managing multiple sampling sites to collect grab samples during the first 60 minutes of a measurable storm event.

RECOMMENDATION: Have a sampling crew ready to help when forecasts indicate that a measurable storm event is likely to occur. If this is not possible, sample the missed outfall locations during other measurable storm events and record this circumstance in the SWPPP.

- **PROBLEM:** Commingling of parking lot runoff with discharge associated with industrial activity.

RECOMMENDATION: The combined runoff must be sampled at the discharge point as near as possible to the industrial activity or at the parking lot drain inlet if there is one.

- **PROBLEM:** Sampling in manholes.

RECOMMENDATION: Sample with a collection device on the end of a pole to reach stormwater. Personnel sampling in manholes should have confined space safety training and ambient air monitoring sampling devices if manholes have to be entered.

- **PROBLEM:** Run-on from other property.

RECOMMENDATION: If possible, collect and examine a sample of the stormwater at the border of the property where the run-on occurs. Then, collect and examine a sample of the stormwater at a facility outfall downstream of the run-on point. Note any ob-



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20, 2006
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servable differences between the samples and maintain the documentation with the SWPPP.

- When confronted with other difficult sampling scenarios not addressed above, the permittee should consult DEP for guidance on how to best address the situation.

6. REFERENCES

- 5.5** GUIDANCE MANUAL FOR THE MONITORING AND REPORTING REQUIREMENTS OF THE NPDES MULTI-SECTOR STORM WATER GENERAL PERMIT
United States Environmental Protection Agency, Office of Water (EN-336), EPA 833-B-99-001(January, 1999)
- 5.6** NPDES STORM WATER SAMPLING GUIDANCE DOCUMENT
United States Environmental Protection Agency, Office of Water (EN-336), EPA 833-8-92-001 (July, 1992)
- 5.7** STATE OF MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION MULTI-SECTOR GENERAL PERMIT MAINE POLLUTANT DISCHARGE ELIMINATION SYSTEM STORMWATER DISCHARGE ASSOCIATED WITH INDUSTRIAL ACTIVITY
Maine Department of Environmental Protection, Bureau Water Quality, Waste Discharge License # W-008227-MN-C-RR (Dec. 2016)

ATTACHMENT F

Guidance

Low Impact Development (LID)

LID is a process of developing land that mimics the natural hydrologic regime. LID begins at the design phase of a new development or redevelopment, incorporating planning techniques that minimize site clearing and impervious surfaces to reduce impact and stormwater runoff generated from the site. By reducing the volume of water leaving a site, the pollutant loading is also reduced. Other techniques that will reduce the volume and peak flow rates of runoff from the development are then incorporated throughout the site. LID is an effective tool that reduces pollutant loading, thermal impacts, stream flows, and minimizes stream channel erosion.

LID is not a rigid set of standards, or a one size fits all approach and has many benefits:

- ✓ **Benefits to the Developer:** The owner and developer will see reduced costs for land clearing and grading, infrastructure, and stormwater management while seeing an increased aesthetic value in the development.
- ✓ **Benefits to the Municipality:** The local government and community will benefit from reduced infrastructure maintenance costs and reductions in property damage from flooding, while having more green space, protected natural resources, and increased water quality.
- ✓ **Benefits to the Environment:** The hydrologic cycle is preserved; streams are less prone to erosion, and stream flows are maintained which benefits fish and wildlife.

LID goals and objectives shall be incorporated into the site planning process as early as possible. The following steps serve as a guideline to use in the planning stage:

- ✓ Identify and preserve areas that will affect the hydrology of the site. Features that should be protected are sensitive areas and natural resources including down gradient waterways.
- ✓ Minimize site disturbance and impervious areas with an alternative layout for the development within the constraints of local development criteria.
- ✓ Minimize the impervious surfaces directly connected to drainage conveyance systems to reduce the time of concentration.
- ✓ Break the site into smaller drainage areas that can be handled using basic LID techniques.

PLANNING FOR LID

Minimize Site Clearing: Development typically involves new impervious surfaces such as roads and buildings, and landscaped areas for lawns. Avoid developing soils with high permeability where possible. Protect areas that are sensitive to disturbance and that will sustain groundwater recharge and reduce runoff. For example, developing a vegetated, tight clay soil area will have less impact on stormwater runoff than developing a forested area on sandy soils. Once the sensitive areas have been identified, the layout of the development should be aligned with the conservation of these areas.

Minimize Impervious Areas: The traffic distribution network (roadways, sidewalks, driveways, and parking areas) is generally the greatest source of site imperviousness and should be the focus for reducing impervious area. The following techniques may be considered, where appropriate and permitted by local land use codes and/or ordinances:

Alternative Roadway Layout: Alternative roadway layouts can be used to reduce total pavement, while allowing for the same amount of development. Cluster development, in accordance with and as allowed by local ordinances can decrease imperviousness.

- ✓ *Narrow Road Sections:* The width of pavement can be reduced by including the primary driving surface, a pervious base for the shoulders, and ditch drainage swale in place of curb and gutter, as deemed appropriate. Use of this technique should be evaluated in accordance with site-specific conditions.
- ✓ *Sidewalks:* Sidewalks can be reduced to one side of the road or eliminated. The use of pervious materials can reduce runoff.
- ✓ *On-Street Parking:* Reduction to one side or elimination of on-street parking has significant potential to reduce overall site imperviousness. On-street parking may be a desirable practice in highly urbanized areas to reduce on-site disturbance.
- ✓ *Rooftops:* The number and size of buildings dictates the impervious area associated with rooftops. Vertical construction and/or the use of green roofs can minimize imperviousness.
- ✓ *Driveways:* Minimizing paved or impervious driveway area can be accomplished through the design of narrower driveways or by reducing the length of driveways. Shared driveways can also reduce imperviousness, where appropriate. In addition, the use of pervious materials can minimize runoff.

Minimize Connected Impervious Areas: The impacts from impervious surfaces can be minimized by disconnecting these areas from piped drainage networks and by managing runoff at the source.

- ✓ Paved driveways and roads can be directed to stabilized, vegetated areas.
- ✓ Flows from large, paved surfaces can be broken up to facilitate on-site management of smaller flows. Breaking flows up allows the flows to be directed to vegetation as sheet flow.
- ✓ LID techniques can be dispersed throughout the development, such as at individual houselots to obtain the most benefit. They can be incorporated into the landscaping of the property to provide a natural treatment system.

Maintain Time of Concentration: When development occurs, the time of concentration (T_c) is often shortened due to the impervious area, causing greater flows over a shorter period of time. LID practices can maintain the pre-development T_c by:

- ✓ Minimizing land disturbance,
- ✓ Detaining flows on site,
- ✓ Increasing the flow length,
- ✓ Increasing the surface roughness of the flow path,
- ✓ Creating flatter slopes, and/or
- ✓ Disconnecting impervious areas, which will decrease their travel rates.

Manage Stormwater at the Source: The impact from a development can be mitigated at the source by reestablishing a more natural hydrologic cycle that sustains a clean stream base flow. Typically, the most economical and simplistic stormwater management strategy is achieved by controlling runoff at the source with a variety of small treatment structures that will result in the reduction of stormwater discharge and more flexibility in the site design.

Soil Considerations:

Minimize Compaction: Compaction reduces the natural infiltrating ability of soils; thus, avoiding disturbance by heavy equipment can benefit infiltration. Designing development to situate impervious surfaces and development disturbances on the more impermeable soils of a site can leave more pervious soils to continue infiltrating runoff.

Increase Organic Content of Soils: When constructing many of the LID vegetated techniques, such as filtration Best Management Practices (BMP), a quality topsoil can optimize pollutant removal. In this case, the soil bed should consist of organic content as described in the relevant filtration BMP. This highly organic layer traps contaminants, absorbs more runoff and provides a medium for biological activity that helps break down pollutants. Planting soil provides a healthy growing medium for vegetation by encouraging strong root growth. In addition, microbes found in healthy soils transform nutrients for plant growth. Compost or other organic amendments can be added at the site preparation level, typically by the truckload. It is also available for little or no cost from many community leaf compost programs. For rain gardens and bioretention areas, organic content can also be valuable in absorbing and retaining moisture for plant life, filtering pollutants, and providing an active layer for microorganisms to reside and reproduce. A healthy microorganism population is key to the decomposition of many pollutants, whether in the home rain garden or in a parking lot.

- Avoid Pesticides/Herbicides: Healthy soil is alive with microorganisms that decompose and inactivate pollutants, but these may be killed by excessive chemicals. Although the soil microorganisms are not typically the target of these chemicals, many of them may fall victim to the use of pesticides. Additionally, insect species that prey on pests are also killed by pesticides. Since the predatory species tend to have slower reproduction than the pest species, a natural defense against insect pests may be lost.

LID TECHNIQUES

Many LID techniques rely on infiltration, retention, and evapotranspiration of stormwater to reduce runoff. When infiltration is not a possibility, the initial planning techniques described above should be the primary focus, followed by the use of small disconnected underdrained systems that rely on soil and vegetation to retain runoff. Examples of LID measures and techniques are shown on Table 1.

- Filters (Bioretention Cells and Rain gardens): Bioretention areas or rain gardens are built with a specific soil filter media (containing organic material and planted with vegetation that can handle wet and dry conditions) that will reduce the volume of runoff through absorption and evapotranspiration. A slight depression allows the ponding of stormwater as it filtrates through the soil media and into the groundwater or to an underdrain for surface discharge.
- Infiltration: Infiltration reduces runoff and mimics the natural hydrologic cycle by redirecting water into the ground rather than to a piped system. Runoff can be reduced by using smaller infiltration basins that fit into the natural landscape.
- Buffers: Vegetated buffers use soils and vegetation to remove pollutants from stormwater. Buffers can be used as a stormwater BMP for small developments by minimizing the amount of runoff generated through infiltration and evapotranspiration. Filter strips are typically used as pretreatment devices for bioretention cells and other infiltration practices.
- Collection Cisterns: In a commercial setting, the collection of rain runoff can be put to use in the building to off-set the cost of water supply. Cisterns can be located either above or below ground, and in out-of-the-way places that can easily be incorporated into a site design. Commercially available systems are typically constructed of high-density plastics and can include pumps and filtration devices. Rain barrels are inexpensive, effective, and easily maintainable when used in residential applications to capture roof runoff for later watering of lawns and gardens.
- Vegetated Rooftops: Vegetated rooftops provide three primary benefits: attenuation of stormwater runoff and peak flows, reductions of the heat island effects with an increase in building insulation, and a longer life expectancy for the base roof material. The stormwater benefit is that the smaller more common storm events are absorbed, which minimizes peak runoff and the net volume of runoff typically produced by roofs.

- ✓ Porous Pavement: Porous pavement is a permeable surface (pervious asphalt, concrete or pavers), a granular base, and subbase materials which allow the penetration of runoff into the underlying soils. The efficiency of pavement alternative systems depends on whether the pavement is designed to store and infiltrate most runoff, or only limited volumes of runoff (e.g., "first-flush") with the remainder discharged to a storm drainage system or overland flow. Maintenance is essential for long-term use and effectiveness. Pavement alternatives vary in load bearing capacities but generally can be designed for low traffic areas such as sidewalks, parking lots, overflowparking and residential roads. It is important to choose a material appropriate for the desired use (light, moderate or heavy use).
- ✓ Other Techniques: LID is about creativity. Multiple practices can be implemented and adapted into various sites and situations. However, they are mostly dependent upon the layout of the development and the disconnection of its individual elements.

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Table 1 – LID Measures and Techniques*

LID Measure	Example Technique	Design
Minimize site clearing	<ul style="list-style-type: none"> • Promote compact development on the site • Place parking underneath or inside structures • Avoid developing in areas with high-permeable soils to retain natural infiltration • Align development layout with conservation of sensitive areas 	
Protect natural drainage system	<ul style="list-style-type: none"> ✓ Maintain a minimum 25 foot buffer on all natural water resources including intermittent channels ✓ Do not divert stormwater from its natural sub-watershed 	
Minimize the decrease in time of concentration	<ul style="list-style-type: none"> ✓ Break up or disconnect the flow of runoff over impervious surfaces ✓ Sheet flow over pavement that is less than 100 feet 	
Minimize impervious area or the effect of impervious area	<ul style="list-style-type: none"> ✓ Build vertically with multi story buildings and parking garages ✓ More than 25% of pavement area (overflow) in pervious pavement. All pedestrian walkways are pavers or pervious pavement. Runoff from paved surfaces should be directed to stabilized, vegetated areas ✓ Disperse LID techniques throughout development and incorporate into the landscaping ✓ Infiltrate as much roof runoff as standards allow <p>Minimize the use of paved areas (sidewalks, driveways and streets)</p> <p>Minimize the use of hardscaped areas.</p>	<p>Design practices developed at the planning phase that will help mitigate environmental impacts. Ideally, these are cost-effective and environmentally friendly.</p>

Table 1 – LID Measures and Techniques*		
LID Measure	Example Technique	Design
Minimize soil compaction	<ul style="list-style-type: none"> · Minimize the construction window and target the development area · Rototilling all areas to be revegetated 	<p>Design practices developed at the planning phase that will help mitigate environmental impacts. Ideally, these are cost-effective and environmentally friendly.</p>
Minimize lawns and maximize landscaping that encourages runoff retention	<ul style="list-style-type: none"> · Low maintenance Maine native plants · No invasive plants · Limit the use of pesticides and biocides · Fertilizer application only during initial planting and repair of damaged areas. 	
Provide vegetated open-channel conveyance systems	<ul style="list-style-type: none"> · Evaluate road gutters and roof gutters to determine effective means to direct runoff to treatment BMPs · Level spreaders to buffers where possible · Underdrained swales 	
Rainwater is stored for later reuse for the building or landscape	Rain Collection Cisterns	
Stormwater Quality Treatment and Retention Requirements	Buffers	
	Infiltration (basins, trenches, dry wells, etc.)	
	Underdrained grass filters	
	Underdrained filter bioretention	
	Roofline filtration	
	Roof Greening	
	Pervious Pavement	

*LID measures, example techniques and design practices in this table are intended to be illustrative and shall be taken into consideration where applicable, practicable and allowable pursuant to applicable land use planning and development requirements.

MAINE POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

STANDARD CONDITIONS APPLICABLE TO ALL PERMITS

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A. GENERAL PROVISIONS

1. General compliance. All discharges shall be consistent with the terms and conditions of this permit; any changes in production capacity or process modifications which result in changes in the quantity or the characteristics of the discharge must be authorized by an additional license or by modifications of this permit; it shall be a violation of the terms and conditions of this permit to discharge any pollutant not identified and authorized herein or to discharge in excess of the rates or quantities authorized herein or to violate any other conditions of this permit.

2. Other materials. Other materials ordinarily produced or used in the operation of this facility, which have been specifically identified in the application, may be discharged at the maximum frequency and maximum level identified in the application, provided:

- (a) They are not
 - (i) Designated as toxic or hazardous under the provisions of Sections 307 and 311, respectively, of the Federal Water Pollution Control Act; Title 38, Section 420, Maine Revised Statutes; or other applicable State Law; or
 - (ii) Known to be hazardous or toxic by the licensee.
- (b) The discharge of such materials will not violate applicable water quality standards.

3. Duty to comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of State law and the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

- (a) The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act, and 38 MRSA, §420 or Chapter 530.5 for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.
- (b) Any person who violates any provision of the laws administered by the Department, including without limitation, a violation of the terms of any order, rule license, permit, approval or decision of the Board or Commissioner is subject to the penalties set forth in 38 MRSA, §349.

4. Duty to provide information. The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

5. Permit actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

6. Reopener clause. The Department reserves the right to make appropriate revisions to this permit in order to establish any appropriate effluent limitations, schedule of compliance or other provisions which may be authorized under 38 MRSA, §414-A(5).

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7. Oil and hazardous substances. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject under section 311 of the Federal Clean Water Act; section 106 of the Federal Comprehensive Environmental Response, Compensation and Liability Act of 1980; or 38 MRSA §§ 1301, et. seq.

8. Property rights. This permit does not convey any property rights of any sort, or any exclusive privilege.

9. Confidentiality of records. 38 MRSA §414(6) reads as follows. "Any records, reports or information obtained under this subchapter is available to the public, except that upon a showing satisfactory to the department by any person that any records, reports or information, or particular part or any record, report or information, other than the names and addresses of applicants, license applications, licenses, and effluent data, to which the department has access under this subchapter would, if made public, divulge methods or processes that are entitled to protection as trade secrets, these records, reports or information must be confidential and not available for public inspection or examination. Any records, reports or information may be disclosed to employees or authorized representatives of the State or the United States concerned with carrying out this subchapter or any applicable federal law, and to any party to a hearing held under this section on terms the commissioner may prescribe in order to protect these confidential records, reports and information, as long as this disclosure is material and relevant to any issue under consideration by the department."

10. Duty to reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.

11. Other laws. The issuance of this permit does not authorize any injury to persons or property or invasion of other property rights, nor does it relieve the permittee of its obligation to comply with other applicable Federal, State or local laws and regulations.

12. Inspection and entry. The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the EPA Administrator), upon presentation of credentials and other documents as may be required by law, to:

- (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- (c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- (d) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

B. OPERATION AND MAINTENANCE OF FACILITIES

1. General facility requirements.

- (a) The permittee shall collect all waste flows designated by the Department as requiring treatment and discharge them into an approved waste treatment facility in such a manner as to

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- maximize removal of pollutants unless authorization to the contrary is obtained from the Department.
- (b) The permittee shall at all times maintain in good working order and operate at maximum efficiency all waste water collection, treatment and/or control facilities.
 - (c) All necessary waste treatment facilities will be installed and operational prior to the discharge of any wastewaters.
 - (d) Final plans and specifications must be submitted to the Department for review prior to the construction or modification of any treatment facilities.
 - (e) The permittee shall install flow measuring facilities of a design approved by the Department.
 - (f) The permittee must provide an outfall of a design approved by the Department which is placed in the receiving waters in such a manner that the maximum mixing and dispersion of the wastewaters will be achieved as rapidly as possible.

2. Proper operation and maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

3. Need to halt or reduce activity not a defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. Duty to mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

5. Bypasses.

- (a) Definitions.
 - (i) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.
 - (ii) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
- (b) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (c) and (d) of this section.
- (c) Notice.
 - (i) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

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- (ii) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph D(1)(f), below. (24-hour notice).
- (d) Prohibition of bypass.
 - (i) Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:
 - (A) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - (B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - (C) The permittee submitted notices as required under paragraph (c) of this section.
 - (ii) The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three conditions listed above in paragraph (d)(i) of this section.

6. Upsets.

- (a) Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
- (b) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph (c) of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
- (c) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - (i) An upset occurred and that the permittee can identify the cause(s) of the upset;
 - (ii) The permitted facility was at the time being properly operated; and
 - (iii) The permittee submitted notice of the upset as required in paragraph D(1)(f) , below. (24 hour notice).
 - (iv) The permittee complied with any remedial measures required under paragraph B(4).
- (d) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

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C. MONITORING AND RECORDS

1. General Requirements. This permit shall be subject to such monitoring requirements as may be reasonably required by the Department including the installation, use and maintenance of monitoring equipment or methods (including, where appropriate, biological monitoring methods). The permittee shall provide the Department with periodic reports on the proper Department reporting form of monitoring results obtained pursuant to the monitoring requirements contained herein.

2. Representative sampling. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. If effluent limitations are based wholly or partially on quantities of a product processed, the permittee shall ensure samples are representative of times when production is taking place. Where discharge monitoring is required when production is less than 50%, the resulting data shall be reported as a daily measurement but not included in computation of averages, unless specifically authorized by the Department.

3. Monitoring and records.

- (a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
- (b) Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years, the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time.
- (c) Records of monitoring information shall include:
 - (i) The date, exact place, and time of sampling or measurements;
 - (ii) The individual(s) who performed the sampling or measurements;
 - (iii) The date(s) analyses were performed;
 - (iv) The individual(s) who performed the analyses;
 - (v) The analytical techniques or methods used; and
 - (vi) The results of such analyses.
- (d) Monitoring results must be conducted according to test procedures approved under 40 CFR part 136, unless other test procedures have been specified in the permit.
- (e) State law provides that any person who tampers with or renders inaccurate any monitoring devices or method required by any provision of law, or any order, rule license, permit approval or decision is subject to the penalties set forth in 38 MRSA, §349.

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D. REPORTING REQUIREMENTS

1. Reporting requirements.

- (a) Planned changes. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:
 - (i) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or
 - (ii) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under Section D(4).
 - (iii) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;
- (b) Anticipated noncompliance. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- (c) Transfers. This permit is not transferable to any person except upon application to and approval of the Department pursuant to 38 MRSA, § 344 and Chapters 2 and 522.
- (d) Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.
 - (i) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Department for reporting results of monitoring of sludge use or disposal practices.
 - (ii) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR part 136 or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Department.
 - (iii) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Department in the permit.
- (e) Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.
- (f) Twenty-four hour reporting.
 - (i) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance

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has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(ii) The following shall be included as information which must be reported within 24 hours under this paragraph.

(A) Any unanticipated bypass which exceeds any effluent limitation in the permit.

(B) Any upset which exceeds any effluent limitation in the permit.

(C) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Department in the permit to be reported within 24 hours.

(iii) The Department may waive the written report on a case-by-case basis for reports under paragraph (f)(ii) of this section if the oral report has been received within 24 hours.

(g) Other noncompliance. The permittee shall report all instances of noncompliance not reported under paragraphs (d), (e), and (f) of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (f) of this section.

(h) Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

2. Signatory requirement. All applications, reports, or information submitted to the Department shall be signed and certified as required by Chapter 521, Section 5 of the Department's rules. State law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan or other document filed or required to be maintained by any order, rule, permit, approval or decision of the Board or Commissioner is subject to the penalties set forth in 38 MRSA, §349.

3. Availability of reports. Except for data determined to be confidential under A(9), above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department. As required by State law, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal sanctions as provided by law.

4. Existing manufacturing, commercial, mining, and silvicultural dischargers. In addition to the reporting requirements under this Section, all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Department as soon as they know or have reason to believe:

(a) That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(i) One hundred micrograms per liter (100 ug/l);

(ii) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;

(iii) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with Chapter 521 Section 4(g)(7); or

(iv) The level established by the Department in accordance with Chapter 523 Section 5(f).

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- (b) That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
- (i) Five hundred micrograms per liter (500 ug/l);
 - (ii) One milligram per liter (1 mg/l) for antimony;
 - (iii) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with Chapter 521 Section 4(g)(7); or
 - (iv) The level established by the Department in accordance with Chapter 523 Section 5(f).

5. Publicly owned treatment works.

- (a) All POTWs must provide adequate notice to the Department of the following:
- (i) Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of CWA or Chapter 528 if it were directly discharging those pollutants.
 - (ii) Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
 - (iii) For purposes of this paragraph, adequate notice shall include information on (A) the quality and quantity of effluent introduced into the POTW, and (B) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.
- (b) When the effluent discharged by a POTW for a period of three consecutive months exceeds 80 percent of the permitted flow, the permittee shall submit to the Department a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans.

E. OTHER REQUIREMENTS

1. Emergency action - power failure. Within thirty days after the effective date of this permit, the permittee shall notify the Department of facilities and plans to be used in the event the primary source of power to its wastewater pumping and treatment facilities fails as follows.

- (a) For municipal sources. During power failure, all wastewaters which are normally treated shall receive a minimum of primary treatment and disinfection. Unless otherwise approved, alternate power supplies shall be provided for pumping stations and treatment facilities. Alternate power supplies shall be on-site generating units or an outside power source which is separate and independent from sources used for normal operation of the wastewater facilities.
- (b) For industrial and commercial sources. The permittee shall either maintain an alternative power source sufficient to operate the wastewater pumping and treatment facilities or halt, reduce or otherwise control production and or all discharges upon reduction or loss of power to the wastewater pumping or treatment facilities.

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2. Spill prevention. (applicable only to industrial sources) Within six months of the effective date of this permit, the permittee shall submit to the Department for review and approval, with or without conditions, a spill prevention plan. The plan shall delineate methods and measures to be taken to prevent and or contain any spills of pulp, chemicals, oils or other contaminants and shall specify means of disposal and or treatment to be used.

3. Removed substances. Solids, sludges trash rack cleanings, filter backwash, or other pollutants removed from or resulting from the treatment or control of waste waters shall be disposed of in a manner approved by the Department.

4. Connection to municipal sewer. (applicable only to industrial and commercial sources) All wastewaters designated by the Department as treatable in a municipal treatment system will be cosigned to that system when it is available. This permit will expire 90 days after the municipal treatment facility becomes available, unless this time is extended by the Department in writing.

F. DEFINITIONS. For the purposes of this permit, the following definitions shall apply. Other definitions applicable to this permit may be found in Chapters 520 through 529 of the Department's rules

Average means the arithmetic mean of values taken at the frequency required for each parameter over the specified period. For bacteria, the average shall be the geometric mean.

Average monthly discharge limitation means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. Except, however, bacteriological tests may be calculated as a geometric mean.

Average weekly discharge limitation means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Best management practices ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Composite sample means a sample consisting of a minimum of eight grab samples collected at equal intervals during a 24 hour period (or a lesser period as specified in the section on monitoring and reporting) and combined proportional to the flow over that same time period.

Continuous discharge means a discharge which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities.

Daily discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the day.

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Discharge Monitoring Report ("DMR") means the EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by approved States as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA's.

Flow weighted composite sample means a composite sample consisting of a mixture of aliquots collected at a constant time interval, where the volume of each aliquot is proportional to the flow rate of the discharge.

Grab sample means an individual sample collected in a period of less than 15 minutes.

Interference means a Discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

- (1) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
- (2) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Maximum daily discharge limitation means the highest allowable daily discharge.

New source means any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced:

- (a) After promulgation of standards of performance under section 306 of CWA which are applicable to such source, or
- (b) After proposal of standards of performance in accordance with section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal.

Pass through means a discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

Permit means an authorization, license, or equivalent control document issued by EPA or an approved State to implement the requirements of 40 CFR parts 122, 123 and 124. Permit includes an NPDES general permit (Chapter 529). Permit does not include any permit which has not yet been the subject of final agency action, such as a draft permit or a proposed permit.

Person means an individual, firm, corporation, municipality, quasi-municipal corporation, state agency, federal agency or other legal entity.

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Point source means any discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation or vessel or other floating craft, from which pollutants are or may be discharged.

Pollutant means dredged spoil, solid waste, junk, incinerator residue, sewage, refuse, effluent, garbage, sewage sludge, munitions, chemicals, biological or radiological materials, oil, petroleum products or byproducts, heat, wrecked or discarded equipment, rock, sand, dirt and industrial, municipal, domestic, commercial or agricultural wastes of any kind.

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Publicly owned treatment works ("POTW") means any facility for the treatment of pollutants owned by the State or any political subdivision thereof, any municipality, district, quasi-municipal corporation or other public entity.

Septage means, for the purposes of this permit, any waste, refuse, effluent sludge or other material removed from a septic tank, cesspool, vault privy or similar source which concentrates wastes or to which chemicals have been added. Septage does not include wastes from a holding tank.

Time weighted composite means a composite sample consisting of a mixture of equal volume aliquots collected over a constant time interval.

Toxic pollutant includes any pollutant listed as toxic under section 307(a)(1) or, in the case of sludge use or disposal practices, any pollutant identified in regulations implementing section 405(d) of the CWA. Toxic pollutant also includes those substances or combination of substances, including disease causing agents, which after discharge or upon exposure, ingestion, inhalation or assimilation into any organism, including humans either directly through the environment or indirectly through ingestion through food chains, will, on the basis of information available to the board either alone or in combination with other substances already in the receiving waters or the discharge, cause death, disease, abnormalities, cancer, genetic mutations, physiological malfunctions, including malfunctions in reproduction, or physical deformations in such organism or their offspring.

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Whole effluent toxicity means the aggregate toxic effect of an effluent measured directly by a toxicity test.

STATE OF MAINE

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Municipal Separate Storm Sewer System Owned by

State And Federal Facilities

Maine Pollutant Discharge Elimination System Permit

FACT SHEET AND RESPONSE TO COMMENTS



MER042000

December 8, 2021 Final Fact Sheet

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PART I. BACKGROUND

A. Clean Water Act

Section 301(a) of the Clean Water Act (CWA) provides that “the discharge of any pollutant by any person shall be unlawful” unless the discharge is in compliance with certain other sections of the Act. 33 U.S.C. 1311(a). The CWA defines “discharge of a pollutant” as “(A) any addition of any pollutant to navigable waters from any point source, (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft.” 33 U.S.C. 1362(12).

In 1987, Congress amended the Clean Water Act to better regulate stormwater discharges. Congress enacted Section 402(p) of the Clean Water Act, which requires that “permits for discharges from municipal storm sewers . . . shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers; and shall require controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provisions as the Administrator . . . determines appropriate for the control of such pollutants.” CWA §§ 402(p)(3)(B)(ii)-(iii).

B. General Permit (GP) Authority

Section 301(a) of the CWA, 33 USC 1311(a), and Maine law 38 M.R.S. §413 makes it unlawful to discharge pollutants to waters of the United States or state without a permit. The State of Maine may issue a GP authorizing the discharge of certain pollutants pursuant to 06-096 CMR 529. 06-096 CMR Chapter 521§9 authorizes the State of Maine to require Maine Pollutant Discharge Elimination System (MEPDES) permits for the discharge storm water from regulated MS4 communities.

Section 402 of the Act provides that the Administrator of the United States Environmental Protection Agency (EPA) may issue National Pollutant Discharge Elimination System (NPDES) permits or the State of Maine can issue MEPDES permits for discharges of any pollutant into waters of the United States according to such specific terms and conditions as the Administrator may require. Although such permits are generally issued to individual subcategories of discharges, including stormwater point source discharges, within a geographic area. 40 CFR §122.28(a)(1) and (2)(i). EPA and the State of Maine issue GPs under the same CWA authority as individual permits. Violations of a general permit condition constitute a violation of the CWA and may subject the discharger to the enforcement remedies provided in Section 309 of the Act, including injunctive relief and penalties.

PART I. BACKGROUND

C. Authorization Under the Permit

The GP authorizes stormwater discharges from small municipal separate storm sewer systems meeting the definition of “small municipal separate storm sewer system” at 40 CFR § 122.26(b)(16) and described in 40 CFR § 122.32(a)(1) (applicable to small MS4s located in an urbanized area) or designated by EPA as needing a permit pursuant to 40 CFR § 122.32(a)(2) or 40 CFR § 122.26(f).

Phase II stormwater regulations, among other things, set forth requirements for stormwater discharges from small municipal separate storm sewer systems, (“small MS4s”) which are defined at 40 CFR § 122.26(b)(16) as follows:

Small municipal separate storm sewer system means all separate storm sewers that are:

- (i) Owned or operated by the United States, a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes including special districts under State law such as a sewer, flood control district or drainage district, or similar entity or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of United States.
- (ii) Not defined as “large” or “medium” municipal separate storm sewer systems pursuant to [40CFR § 122.26(b)(4) or (b)(7)] or designated under [40 CFR § 122.26(a)(1)(v)].
- (iii) This term includes systems similar to separate storm sewer systems in municipalities such as military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

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The regulations at 40 CFR § 122.32(a)(1) state that an MS4 is regulated by the program if the MS4 is located in an urbanized area as determined by the latest Decennial Census by the Bureau of the Census unless granted a waiver by the permitting authority. The latest Decennial Census was conducted in 2010. MS4s located in an urbanized area as determined by the 2010 Census will be subject to the stormwater requirements for small MS4s unless they receive a waiver in accordance with 40 CFR §122.32(c) or 40 CFR § 123.35(d). MS4s located in an urbanized area as defined by the 2010 census remain subject to the stormwater regulation even if there is a change in the reach of “urbanized area” because of a change in census data. This is consistent with the preamble to the Phase II rule that states “...a small MS4 that is automatically designated into the NPDES program for stormwater under an urbanized area calculation for any given Census year will remain regulated regardless of the results of subsequent urbanized area calculations.” 64 FR 68752, December 8, 1999.

As stated previously, this GP applies to small MS4s located in urbanized areas and those MS4s designated by EPA to need a permit. EPA has authority under the CWA to designate stormwater sources other than those that are specifically identified by the stormwater regulations as needing to obtain a permit when necessary to protect water quality or remedy localized water quality impacts, including small MS4s not in an urbanized area. If EPA decides to designate additional MS4s, EPA will provide public notice and an opportunity to comment on the designation. Once designated, such sources would be eligible for coverage under this general permit.

D. Obtaining Authorization to Discharge

The regulations at 40 CFR § 122.33 require small MS4s who apply for a GP to submit information on best management practices (BMPs) and measurable goals designed to meet the minimum control measures (MCMs) required by 40 CFR § 122.34(d). To obtain authorization to discharge, the operator of a small MS4 must submit a complete and accurate Notice of Intent (NOI) containing the information requested in Part III(D) of the GP. The NOI must be signed in accordance with the requirements as specified in Part III(D)(2) of the GP. The NOI must be submitted on or before March 1, 2022. The effective date of the permit is October 1, 2022. A small MS4 will be authorized to discharge under this permit upon the issuance of written authorization by the Maine Department of Environmental Protection (MDEP).

The MS4 operators must complete the information required in the NOI to the best of their knowledge. The NOI must contain the details of an MS4’s planned approach to meeting the terms of the GP. The NOI should detail milestones as well as interim steps. The NOI does not require the development of technical or engineering reports for its submission. The GP does not incorporate the contents of the NOI into the permit as conditions. The GP and the permittee specific MDEP Order conditions are those that are contained in the GP and the permittee specific MDEP Order and those are the requirements the permittee is expected to meet. The NOI presents the BMPs that the MS4 intends to implement to meet the permit terms. Since the BMPs presented in the NOI are not incorporated into the GP and the permittee specific MDEP Order, this means that a permittee is able to adjust the initially planned BMPs based on progress and circumstances encountered during program implementation.

PART I. BACKGROUND

All NOIs must be submitted to MDEP **on or before March 1, 2022**, and addressed to the MS4 Program Manager as follows:

MS4 Stormwater Coordinator
MS4 Program Manager
Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017 e-mail: gregg.wood@maine.gov

The GP provides continued authorization for permittees authorized by the 2013 permit whose authorization was effective beginning June 27, 2013 and who submits a complete and accurate NOI on or before March 1, 2022. Permittees will remain authorized under the 2013 permit until authorization under the newly issued GP is either granted or denied.

NOIs will be available for public comment for a minimum of 30 days. Once MDEP determines that an NOI is complete, the NOI will be posted on MDEP's website. Any comments on an NOI must be submitted to the MDEP. MDEP will work with the state and federally facilities to address public comments as appropriate. Following the close of the public comment period on the NOI, the MDEP will issue a permittee specific MDEP Order for a 30-day public comment period that establishes a list of required actions and corresponding schedules of compliance for a limited number of BMPs associated with the implementation of the GP. Following the 30-day comment period, the MDEP will issue a final permittee specific MDEP Order. An applicant is authorized to discharge when the GP becomes effective and the applicable permittee specific DEP Order establishing a list of required actions and a corresponding schedule of compliance for the action items is issued as a final agency action.

E. Individual and Alternative Permits

Any owner or operator of a small MS4 authorized by a GP may request to be excluded from authorization under a GP by applying for an individual permit pursuant to 40 CFR § 122.33(b)(2)(i) or (ii). This request shall be made by submitting a Maine Pollutant Discharge Elimination System (MEPDES) permit application together with reasons supporting the request. The MDEP may require any permittee authorized by a general permit to apply for and obtain an individual permit. Any interested person may petition the MDEP to take this action. 40 CFR § 122.28(b)(3).

However, individual permits will not be issued for sources authorized by the GP unless it can be clearly demonstrated that inclusion under the GP is inappropriate or an individual permit is more applicable to the applicant's system.

The MDEP may consider requiring an individual permit when:

- a. The discharger is not in compliance with the terms and conditions of the GP;
- b. A change has occurred in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source;

PART I. BACKGROUND

- c. Effluent limitations guidelines are subsequently promulgated for the point sources covered by the GP;
- d. A Water Quality Management Plan (WQMP) or Total Maximum Daily Load (TMDL) containing requirements applicable to such point sources is approved;
- e. Circumstances have changed since the time of the request to be covered so that the discharger is no longer appropriately controlled under the GP, or either a temporary or permanent reduction or elimination of the authorized discharge is necessary; and
- f. The discharge(s) is a significant contributor of pollutant or in violation of state water quality standards for the receiving water.

In accordance with 40 CFR § 122.28(b)(3)(iv), the applicability of the GP is automatically terminated on the effective date of the individual permit.

Additionally, any interested person may petition the MDEP to require a MEPDES permit for a discharge composed entirely of stormwater which contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States pursuant to 40 CFR § 122.26(f) or waters of the state pursuant to Maine law 38 M.R.S. §413.

PART II. BASIS FOR CONDITIONS OF THE DRAFT MEPDES GENERAL PERMIT

A. Maine Pollutant Discharge Elimination System (MEPDES) Permits

A MEPDES permit authorizes the discharge of a pollutant or pollutants into a receiving water under certain conditions. The MEPDES program relies on two types of permits: individual and general. An individual permit is a permit specifically tailored for an individual discharger or situations that require individual consideration. Upon receiving the appropriate permit application(s), the permitting authority develops a draft permit for public comment for that particular discharger based on the information contained in the permit application (e.g., type of activity, nature of discharge, receiving water quality). Following consideration of public comments, a final permit is then issued to the discharger for a specific time period (not to exceed five years) with a provision for reapplying for further permit coverage prior to the expiration date.

In contrast, a GP covers multiple facilities/sites/activities within a specific category for a specific period of time (not to exceed 5 years). For GPs, the MDEP develops and issues the permit in advance, with dischargers then generally obtaining coverage under the permit through submission of a NOI. A GP is also subject to public comment prior to issuance. For the case of this GP, the MDEP is the permitting authority. The permitting authority reviews the permittees and geographic area and develops appropriate permits considering technology and water quality. In addition, the Department may issue a permit that

PART II. BASIS FOR CONDITIONS OF THE DRAFT MEPDES GENERAL PERMIT

has different requirements from a NPDES permit issued by the EPA for similar types of discharges, as long as it satisfies the regulatory requirements of the NPDES program, the CWA, and state law.

Under 40 CFR 122.28 and 06-096 Code of Maine Regulation (CMR) Chapter 529, §(2)(a)(1)(iv), GPs may be written to cover categories of point sources having common elements, such as facilities that involve the same or substantially similar types of operations, that discharge the same types of wastes, or that are more appropriately regulated by a GP.

The final MS4 GP Remand Rule promulgated by the EPA in December 2016, establishes two alternative approaches an NPDES/MEPDES permitting authority can use to issue and administer small MS4 GPs that address a partial remand of the Phase II stormwater regulations by the U.S. Court of Appeals for the Ninth Circuit. Both approaches ensure that the permitting authority establishes what is necessary for the MS4 to “reduce the discharge of pollutants from the MS4 to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act,” referred to as the “MS4 permit standard,” and that the public participation requirements of the CWA are met.

The final rule amends 40 CFR § 122.28(d) to require permitting authorities to choose one of these two types of general permits whenever issuing a small MS4 general permit. Permitting authorities are required to select either the “Comprehensive General Permit” or “Two-Step General Permit”. The “Comprehensive General Permit” is essentially the “Traditional General Permit”, or “Option 1”, from the proposed rule. The “Two-Step General Permit” encompasses both the “Procedural Approach”, or “Option 2” and the “hybrid approach” that was described as part of “Option 3” from the proposed rule. The Two-Step General Permit allows the permitting authority to establish some requirements in the general permit and others applicable to individual MS4s through a second proposal and public comment process. The State of Maine has selected the Two-Step General Permit approach.

Part IV of this GP sets forth the requirements for the MS4 to “reduce pollutants in discharges to the maximum extent practicable (MEP), including management practices, control techniques, and system, design and engineering methods...” CWA § 402(p)(3)(B)(iii). MEP is the statutory standard that describes the level of pollutant reduction that MS4 operators must achieve, but also includes a recognition that the effort may be increased under some circumstances. The MDEP believes implementation of best management practices (BMPs) designed to control stormwater runoff from the MS4 is generally the most appropriate approach for reducing pollutants to satisfy the MEP standard. Pursuant to 40 CFR §122.44(k), the GP requires permittees to control stormwater discharges through BMPs, including development and implementation of a comprehensive stormwater management program (SWMP) as the mechanism to achieve the required pollutant reductions.

PART II. BASIS FOR CONDITIONS OF THE DRAFT MEPDES GENERAL PERMIT

Neither the CWA nor the stormwater regulations provide a specific definition of MEP. The lack of a detailed definition allows flexibility in MS4 permitting. The MDEP views the MEP standard in the CWA as an iterative process. MEP should continually adapt to current conditions and BMP effectiveness. The MDEP and EPA believe that compliance with the MEP requirements (Part IV) of this GP will meet the MEP standard of the CWA and the stormwater regulations. The iterative process of MEP consists of the state and federal facilities developing a program consistent with specific permit requirements, implementing the program, evaluating the effectiveness of BMPs included as part of the program, revising those parts of the program that are not effective at controlling pollutants, implementing the revisions, and then evaluating again. This process continues until water quality standards are attained. The changes contained in the GP from the previous permit reflect the iterative process of MEP. Accordingly, the GP contains more specific tasks and details than the previous MS4 permit.

MS4s are required to implement and enforce SWMPs designed to reduce pollutants discharged from their MS4s to the maximum extent practicable and to protect water quality. Implementation of a program to these standards should ensure the protection of aquatic life and maintenance of the receiving water as an aquatic habitat.

In addition, the GP prohibits violations of state water quality standards and imposes a variety of additional conditions on discharges to Urban Impaired Streams (UISs) which are found in Appendix B of the GP.

The conditions of this GP also aim to achieve and maintain water quality standards through the antidegradation provisions contained within the Clean Water Act (CWA).

B. Non- Numeric Effluent Limitations

When the regulatory agencies have not promulgated national limitation guidelines (NEGs) for a category of discharges, or if an operator is discharging a pollutant not covered by a NEG, permit limitations may be based on the best professional judgment (BPJ) of the agency or permit writer. For this permit, effluent limits are based on BPJ. The BPJ limits in this permit are in the form of non-numeric control measures, commonly referred to as best management practices (BMPs). Non-numeric limits are employed under limited circumstances, as described in 40 CFR § 122.44(k) and 06-096 CMR Chapter 525 §5(k). 40 CFR § 122.44(k), and 06-096 CMR Chapter 525 §5(k) provides that permits may include BMPs to control or abate the discharge of pollutants when: “(1)[a]uthorized under section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities; (2) [a]uthorized under section 402(p) of the CWA for the control of stormwater discharges; (3) [n]umeric effluent limitations are infeasible; or (4) [t]he practices are reasonable to achieve effluent limitations and standards or to carry out the purpose of the CWA.” The GP regulates stormwater discharges with BMPs. Due to the variability associated with stormwater, EPA and the MDEP believe the use of BMPs is currently the most appropriate method to regulate discharges of stormwater from municipal systems in accordance with the above referenced regulation.

PART II. BASIS FOR CONDITIONS OF THE DRAFT MEPDES GENERAL PERMIT

1. Water Quality Based Effluent Limitations

If an MS4 discharges into waters that are meeting water quality standards, and there is no specific evidence to suggest that a permittee's MS4 discharges would cause or contribute to exceedances of water quality standards, then the permittee is subject to the permit's MEP- based minimum control measures to protect water quality. "Absent evidence to the contrary, EPA and MDEP presume that a small MS4 program that implements the six minimum measures... "does not require more stringent limitations to meet water quality standards." However, MEP-level controls alone may not suffice to eliminate stormwater-based exceedances of water quality standards. Consequently, EPA and the MDEP have determined that it is necessary and "appropriate" to include water quality based effluent limitations (WQBELs). The purpose of these parts is to establish the broad inclusion of water quality-based effluent limitations for those discharges requiring additional controls in order to achieve water quality standards. For example, discharges that would cause or contribute to an instream exceedance of water quality standards are not authorized. Similarly, discharges into any water for which a TMDL had been established were not authorized unless they were consistent with the TMDL [see Part IV(D)]. Since the issuance of the 2013 permit, permittees have implemented SWMPs to comply with the conditions of that permit. This GP requires the permittees to implement an updated SWMP to comply with several additional and strengthened permit conditions, which should result in further water quality improvements.

2. Allowable Non-Stormwater Discharges

Part IV(3)(h) of the GP lists sources of non-stormwater discharges contained in 40 CFR § 122.34(b)(3). These are sources of allowable non-stormwater into the MS4. However, if the permittee or the MDEP determines that these sources (either categorically or individually) are significant contributors of pollutants to the MS4, the permittee must control or prohibit these sources of non-stormwater as part of its illicit discharge detection and elimination (IDDE) program. The GP does not require any action by the permittee regarding these discharges if the permittee determines that these sources are not significant contributors of pollutants to the MS4. The EPA and MDEP expect MS4s to examine the sources of non-stormwater discharges as categories and examine their potential to contribute pollutants to the MS4. For example, potable water may not contribute pollutants that affect the MS4 discharges because the source is associated with the water supply. However, foundation drains and crawl spaces within basements and the type of pollutants associated with the non-stormwater discharge may be unknown. The permittee must document its determinations on the categories of non-stormwater in its SWMP and must prohibit any sources identified as a significant contributor of pollutants.

PART II. BASIS FOR CONDITIONS OF THE DRAFT MEPDES GENERAL PERMIT

3. Discharges to Waterbodies with an Approved TMDL

The EPA and MDEP regulations require that TMDLs be developed for water bodies listed pursuant to CWA §303(d) as not meeting applicable standards (see 40 CFR § 130.7 for the regulations associated with TMDLs). A TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. The TMDL allocates pollutant loadings to the impaired waterbody from all point and non-point pollutant sources. Regulations at 40 CFR § 130.2 define the TMDL as “the sum of the individual waste load allocations (WLA) for point sources and load allocations (LAs) for non-point sources.” Mathematically, a TMDL is expressed as:

$$\text{TMDL} = \sum \text{WLA} + \sum \text{LA} + \text{MOS}$$

The MOS (margin of safety) takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality in determining an acceptable load of pollutants to a receiving water. In addition to the MOS, WLAs and LAs make up portions of a receiving water’s loading capacity. The TMDL forms the basis for an implementation plan to meet the loading capacity of the waterbody. Implementation of the plan should result in the achievement of water quality standards. See Part IV(E) of this GP for compliance with TMDL requirements.

4. Requirements to Reduce Pollutants to the Maximum Extent Practicable (MEP)

MEP is the statutory standard that established the level of pollutant reduction required by permits for operators of MS4s. All MS4 permittees are subject to MEP requirements. There is not a precise regulatory definition of MEP. Rather, as EPA explained in the preamble to the Phase II regulations, “MS4s need the flexibility to optimize reductions in storm water pollutants on a location-by-location basis.... The pollutant reductions that represent MEP may be different for each small MS4, given the unique local hydrologic and geologic concerns that may exist and the differing possible pollutant control strategies.” Accordingly, the GP requires each permittee to determine appropriate BMPs to satisfy each of the six minimum control measures through an evaluative process.

MEP is expected to continue to adapt based on changing conditions, improving BMP effectiveness, and increasing operator capabilities. 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. The MDEP developed the MEP provisions in this GP after reviewing annual reports and stormwater management plans to consider measures being employed by MS4s to implement the MS4-2013 permit. The MDEP also reviewed other MS4 general permits in New England to better understand what other MS4s are being required to do to control stormwater pollutants in order to determine what would be practicable enhancements to the MS4-2013 MEP requirements. The MEP provisions in this GP reflect the approach of building on the existing programs of the 2013 permit with additional requirements that the MDEP believes are practicable and satisfy the MEP statutory requirement.

PART II. BASIS FOR CONDITIONS OF THE DRAFT MEPDES GENERAL PERMIT

C. Stormwater Management Program (SWMP)

The SWMP is a written document required by the GP. The SWMP is the mechanism used to document the practices the permittee is implementing to meet the terms and conditions of the GP. The SWMP is expected to accurately reflect the permittee's activities. The document should be updated and/or modified during the permit term as the permittee's activities are modified or changed during the permit term or to incorporate additional BMPs to comply with permit conditions during the permit term.

The GP requires that the SWMP be a written document and signed in accordance with Part III(A)(2)(a). The SWMP must be available at the office or facility of the person identified on the NOI as the contact person for the SWMP. The SWMP must be immediately available to MDEP and EPA upon request. The permittee must also make the SWMP available to any member of the public who makes a request. The GP requires the permittee to post the SWMP online if a website is available for posting of documents under the control of the permittee, or make it available at a public location if the permittee does not have a website on which to make the SWMP available.

The MDEP and EPA believe that a written program provides a central, accessible source for all information relating to the SWMP. The SWMP required by this GP builds on the requirements of the MS4-2013 permit. While updating the SWMP required by this GP, the permittee must continue to implement the SWMP that was required by the MS4-2013 permit. Permittees covered by the MS4-2013 permit must update their SWMP and submit the updated SWMP as an attachment to the NOI.

The SWMP must document the actions the permittee has taken or will take to demonstrate compliance with the control measures and other conditions of the GP. The MDEP has determined that implementation of the conditions required by Part IV of this GP will meet the MEP standard of the CWA and will be protective of water quality.

1. Control Measures

Implementation of the SWMP involves the identification of BMPs to address the control measures and the identification of measurable goals for the BMP. The GP identifies the long-term objective of each control measure. The long-term objective of the control measure may not be completely met at the end of the term of the GP, but the permittee should be able to demonstrate progress towards the defined long-term objective. The permittee must implement the control measures described in the GP and document actions in the SWMP demonstrating progress towards achievement of the objective of the control measure. The permittee must identify interim goals as steps towards achievement of the long-term objective. This process represents the iterative nature of MEP.

PART II. BASIS FOR CONDITIONS OF THE DRAFT MEPDES GENERAL PERMIT

Goals identified as part of the SWMP must be measurable. A “measurable goal” is a goal for which progress can be tracked or measured. A well-defined goal will have an outcome associated with it. Goals can be expressed as short term, mid-range or long term. The permittee must evaluate the success of a goal. The permittee can evaluate the success of the goals using a variety of indicators including programmatic, social, physical, hydrological, or environmental changes.

Measurable goals may be expressed either quantitatively or qualitatively. The method used to assess whether a goal has been met should be measurable, reliable, relevant, and an actual measure of the outcome. There are various methods to measure outcome. These include confirmation or documentation that a task has been completed; tracking an absolute number or value of something; surveying to determine the knowledge or awareness of a group; inspections to make actual observations of an event; and monitoring to obtain an actual measurement of a pollutant in-stream or in an outfall, and using surrogates for pollutant removal. In some instances, the GP identifies specific measurement methodologies. In others, the permittee may select a method of evaluation that satisfies the discussions above.

In accordance with 40 CFR § 122.35, the GP allows an MS4 to rely on another entity for implementation of all or part of a permit condition or control measure. The permittee may rely on the other entity if the other entity is actually implementing the control measure or permit condition. The other entity must agree to implement the measure or condition for the MS4. This agreement must be included as part of the SWMP. If the other party fails to implement the measure or permit condition, the permittee is ultimately legally responsible for its implementation.

The intent of this provision is not that the other entity is provided more flexibility than the permittee. The permit is intended to allow flexibility to the permittee in the methodology it uses to implement some of the GP provisions. Many permit requirements are an “end point” and typically do not dictate the process to that end point. Different activities can accomplish the same task. For example, the permit requires an education program, but does not provide the methodology for putting the program together. Another entity could develop an education program which has the same elements of the GP and the permittee could rely on that other entity to comply with the terms of the GP. The permittee is expected to achieve the “end point” and this provision allows it to rely on another entity to accomplish the required measure. The permittee remains responsible for complying with the permit even if it shares, delegates, or otherwise arranges for another entity to perform some of the actions under the permit.

PART II. BASIS FOR CONDITIONS OF THE DRAFT MEPDES GENERAL PERMIT

2. Implementation of the SWMP includes:

- a. **MCM1 - A Public Education/Outreach Program:** The GP requires that the permittees implement an education program to distribute educational materials to the populations within the MS4 or conduct other outreach activities about the impacts of stormwater discharges on water bodies within the MS4 jurisdiction and steps the public can take to reduce pollutants in stormwater runoff [See Part IV(C)(1) of the permit].

The permittee must at a minimum develop and implement an ongoing Education/Outreach Program addressing stormwater discharges and impacts on water bodies and steps that can be taken to reduce pollutants in stormwater runoff. The program must be designed to address stormwater issues of significance. The ultimate objective of the program is to change behavior of the target audiences so that pollutants in stormwater are reduced.

The education program must be specific to the MS4 and builds upon what was conducted as required by the 2013 permit. The GP describes requirements that slightly increase the expectations and requirements for a permittee's education program and attempts to provide more guidance on targets for the program, building upon what was conducted and reported as completed by permittees in the previous permit term. The overall long-term goal of an effective education program is to change an identified behavior and increase the knowledge of the population within the MS4.

The MDEP expects an education program to have a defined and targeted message for each of the different audiences and to include methods to evaluate effectiveness of the educational messages. In order to achieve the objective of this measure, the GP includes detailed expectations for educating the population within the MS4.

This GP defines target audiences and requires the permittee to provide educational materials to each. The GP includes topics for consideration for all audiences. The permittee may use those topics listed or may focus on other topics specific to the small MS4. Any method the permittee uses to measure the effectiveness of the education should be linked to the established measurable goals. Some examples include surveys to gauge changes in behavior or awareness. Quantifiable data such as the number of brochures distributed, the number of hits on a website, or the number of public attendees at MS4 sponsored events can be tracked. The permittee may identify a specific behavior the program is targeting and track metrics which show the adaptation of that behavior. The educational messages should reflect the needs and characteristics of the area served by the MS4. This may include distribution of materials in a language other than English, as appropriate. Permittees can form partnerships with other organizations to assist in the implementation of its education and outreach programs. These partnerships may include other MS4s in a watershed, environmental groups, watershed associations, or other civic organizations.

PART II. BASIS FOR CONDITIONS OF THE DRAFT MEPDES GENERAL PERMIT

The GP contains requirements to evaluate the effectiveness of the education program. When designing the education program, the permittee should determine evaluation techniques up front. For example, if a permittee wants to track the number of hits on the permittee's website, the website should be designed with a tracking mechanism. Evaluations can focus on the process, the impact, or the content. Indicators such as administrative, social or environmental can also factor into the evaluation of program effectiveness.

Ideally, an MS4's public education program should include goals and objectives that are based on specific stormwater issues in the MS4 or pollutants of concern within a waterbody. Each MS4 may select its own unique set of goals or objectives, but the ultimate outcome of the program is to elicit specific changes in behavior that in turn benefits water quality. The measurement of the effectiveness of the educational messages should be linked to the measurable goals established by the MS4. For example, a measurable goal may be to decrease the amount of trash in a local park by a certain percentage. The permittee installs more trash barrels and signs, establishes a clean-up day then monitors the results for a defined period of time. If the amount of trash decreases based on the efforts of the permittee, then the permittee could conclude that both the message and delivery of the message were effective.

Watershed and other environmental organizations, regional stormwater coalitions, and other municipalities may collaborate with permittees and many have materials for use in conducting outreach.

b. MCM2 - Public Involvement and Participation

This control measure is closely related to the public education and outreach control measure. When the population within the MS4 is given an opportunity to understand and participate in a stormwater protection program, they generally will become supportive of the program. This measure is to provide and engage the public with opportunities to participate in the review and implementation of the SWMP. [See Part IV(C)(2) of the permit].

The objective of this minimum control measure is to involve the population within the MS4 in both the planning and implementation process of improving water quality and reducing storm water quantity via the storm water program. A program planned with a stakeholder group is more likely to be successful in achieving its goals. The involvement of the population within the MS4 can provide valuable input and assistance to a MS4's storm water management program. Therefore, the MS4 should be given opportunities to play an active role in both the development and implementation of the program. An active and involved community is crucial to the success of a storm water management program because it allows for broader public support, additional expertise and a conduit to other programs. The MS4 community members are also more likely to apply these lessons/BMPs at home.

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Permittees are encouraged to provide more interactive opportunities for MS4 community participation. Examples include volunteer water quality monitoring, community clean up days, hazardous waste collection days, and adopt a drain/adopt a stream programs.

The GP requires that the permittee annually provide an opportunity for the population within the MS4 to participate in the implementation of the SWMP. Participation efforts should attempt to engage all groups serviced by the MS4. This effort may include creative information messages such as announcements in newsletters, use of television spots on the local cable channel, or announcements or displays at civic meetings. One goal of MS4 community participation is to involve a diverse cross-section of people in the MS4 community to assist in development of a stormwater management program that meets the needs of the permittee and the community serviced by the MS4.

- c. **MCM-3 - Illicit Discharge Management:** The GP requires that the permittees prohibit the discharge of non-precipitation flows (“illicit” or “non-stormwater” flows) to the MS4s. Permittees must conduct aggressive, thorough, and systematic illicit discharge investigations and removal of illicit connections. The GP requires permittees to develop a written Illicit Discharge Detection and Elimination (IDDE) protocol that includes specific requirements and procedures for implementation of the IDDE program. Examples of these requirements are a detailed map, a written prioritization of areas with a potential of illicit discharges, dry weather outfall monitoring, wet weather assessment, record keeping, and thorough and complete storm drain network investigations that systematically and progressively evaluate manholes in the storm system to narrow the location of a suspected illicit connection or discharge to an isolated pipe segment (see Part IV(C)(3) of the permit).

Each permittee must implement and enforce a program to detect and eliminate illicit discharges and non-stormwater discharges, as defined in 06-096 CMR 521(9)(b)(2), except as provided for allowable non-stormwater discharges. The program must address illicit discharges in 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. The period between identification and elimination of an illicit discharge is not a grace period. Discharges from an MS4 that are mixed with an illicit discharge are not authorized by this GP and remain unlawful until eliminated.

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The MS4-2013 permit required each MS4 to develop and implement an IDDE program. Since issuance of that permit, the MDEP and MS4s have gained an improved and more comprehensive understanding of the nature of illicit discharge connections; the extent of the problem; effective technologies and procedures to detect and verify illicit connections; and the best practices to reduce discharges of contaminated stormwater due to the presence of illicit connections. In light of the demonstrated results and practical experience gained from these efforts, this GP requires more specific BMPs than the 2013 permit. Examples of these requirements are a detailed map, a written prioritization of areas with a potential of illicit discharges, dry weather screening and monitoring, wet weather outfall assessments, record keeping, and thorough and complete storm drain network investigations that systematically and progressively evaluate manholes in the storm system to narrow the location of a suspected illicit connection or discharge to an isolated pipe segment.

This control measure requires the MS4 to detect and eliminate illicit discharges from its municipal separate storm sewer system. The regulations at 40 CFR §122.26(b)(2) define an illicit discharge as “...any discharge to a municipal separate storm sewer system that is not composed entirely of stormwater except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from firefighting activities.” Some illicit discharges enter the storm system directly, such as incorrectly connected wastewater discharge lines, while others may enter indirectly, such as through infiltration from cracked sanitary lines or spills collected by drain outlets. Both types of discharges can contribute pollutants to the system that in turn affect water quality. An illicit discharge is, with limited exceptions, any discharge to a municipal separate storm sewer system that is not stormwater.

Consistent with 40 CFR § 122.34(b)(3)(iii), the GP contains a list of specific types of non-stormwater discharges that the permittee must address only if the permittee identifies such discharges as significant contributors of pollutants. MS4s should examine the potential sources as categories or individual discharges and examine the potential of those categories or individual discharges to contribute pollutants to the MS4.

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For example, potable water may not contribute pollutants that affect the MS4 discharges because the source is associated with the water supply. However, foundation drains and crawl spaces may be associated with basements and the type of pollutants may be unknown. In this situation, the MS4 may want to establish a registration program and incorporate an educational message about proper storage of household chemicals, or the permittee may prohibit this source of non-stormwater due to the unknown nature of the pollutants. The permittee must document its determinations on the categories of non-stormwater in its SWMP and must prohibit any sources identified as significant contributors of pollutants.

For all other non-stormwater discharges, the GP describes required components of an illicit discharge detection and elimination program.

The EPA and MDEP believe that the inclusion of elements in the permit as requirements instead of guidance represents a necessary step to strengthen requirements of the IDDE program and creates an aggressive, thorough, and systematic approach that can be implemented across the state that will lead to improvements to water quality. The EPA and MDEP feel that the level of effort described in Part IB(C)(3) of the GP is necessary and appropriate to ensure discharges from the MS4 are limited to the stormwater discharges authorized by this GP.

1. Written Illicit Discharge Detection and Elimination Program

The MS4 must have adequate legal authority to implement the following activities as part of the IDDE program: prohibit illicit discharges; investigate suspected illicit discharges; eliminate illicit discharges and enforce the IDDE program. The 2013 permit required development of a regulatory mechanism to address the required program components. The MS4 must reference the authority to implement this measure in the IDDE program. The IDDE program is part of the overall SWMP.

The GP builds on the requirements of the 2013 permit by detailing additional required components of an illicit discharge detection and elimination program. One component is a written protocol that clearly identifies responsibilities with regard to eliminating illicit connections. A second component is to maintain up-to-date maps of the state and federally owned or operated storm sewer system. The final component is a written systematic protocol for locating and removing illicit connections.

The permittee must have in place a written protocol that clearly identifies methodologies and responsibilities with regard to detecting and eliminating illicit discharges. The permittee may incur the initial costs and seek partial or complete reimbursement from the owner of the illicit connection depending on the specifics

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of the situation and local and state law. The MDEP does not require a specific methodology, only that one exists and that the staff responsible for locating and removing illicit connections is familiar with it. The protocol must also define appropriate methods for removal of the illicit discharge or connection. The protocol must identify appropriate procedures or methodologies for confirmation of removal of illicit discharges or connections.

A storm drain network investigation involves systematically and progressively opening and inspecting key junction manholes in the system to narrow the location of an illicit discharge to an isolated pipe segment between two manholes. The permittee shall inspect key junction manholes for visual evidence of illicit connections or discharges (e.g. excrement, toilet paper, or sanitary products). When flow is observed in the manhole, the permittee may sample for ammonia and surfactants using field test kits if desired. Ammonia is a useful indicator of sewage. The concentration of ammonia is higher in sewage than in ground water or tap water. Surfactants are the active ingredient in most commercial detergents. Surfactants are typically measured as Methyl Blue Active Substances (MBAS). These are a synthetic replacement for soap. The presence of surfactants is an indicator of sewage and wash waters. There are other indicator parameters the permittee could use such as fluoride; municipalities typically add fluoride to drinking water supplies, and its presence is an indicator of tap water. Potassium is another indicator that has relatively high concentrations in sewage and the permittee may choose to sample for potassium but it is not required. When the concentration of potassium is evaluated in combination with the concentration of ammonia, the ratio of the two can help distinguish wash waters from sanitary wastes. In addition to the use of indicators to help identify the source of an illicit connection or discharge, the permittee may use dye testing, video testing, smoke testing or other appropriate methods to locate illicit connections or discharges.

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The GP requires the permittee to either remove or eliminate the illicit discharge or take appropriate actions within sixty (60) days of detection. Where elimination of an illicit discharge within 60 calendar days of its identification and verification as an illicit discharge is not possible, the permittee must establish an expeditious schedule for its elimination and report the dates of identification and schedules for removal in the permittee's annual reports. The permittee must also track the progress of the IDDE program implementation. Appropriate tracking indicators are those that demonstrate elimination of a pollutant source and/or water quality improvements.

Other examples include the number of reported illicit discharges, the number of illicit connections located, and the number of illicit connections repaired or removed and volume of illicit discharge removed.

In addition to detecting and removing illicit discharges, the permittee must also develop and implement mechanisms and procedures for preventing illicit discharges. This includes training to inform public employees, businesses, and the general public of the hazards associated with illegal discharges. The requirement to prevent illicit discharges can be incorporated into the public education and public participation control measures. Examples of mechanisms to prevent illicit discharges include identification of opportunities for pollution prevention or source control; distribution of information concerning car washing or swimming pool draining; routine maintenance activities; and inspections of facilities particularly facility drains undergoing work.

2. Dry weather monitoring

This GP advances the dry weather outfall inspection program in the 2013 permit by requiring permittees to conduct dry weather sampling for parameters depending on evidence observed during the inspections. Where dry weather flow exhibits evidence of an illicit discharge based on the dry weather inspection, the permittee must investigate the source of the illicit discharge using one or more of the following techniques until either a source is identified, or it has been determined that the evidence of the illicit discharge is due to naturally occurring source(s).

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Sampling and analysis for one or more parameters consistent with the source that is suspected based on the evidence observed including but not limited to:

- *E.coli*, enterococci, total fecal coliform or human bacteroides, ammonia, optical enhancers, or surfactants.
- Total residual chlorine or free chlorine.
- Optical enhancers or surfactants

All analyses can be performed with field test kits or field instrumentation and are not subject to 40 CFR Part 136 requirements given the sampling is for investigative purposes and not to determine compliance with this permit. Sampling for ammonia and surfactants must use sufficient sensitive methods to detect said parameters at or below the minimum reporting concentrations as follows: 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).

3. Wet weather assessment

The GP advances the IDDE program required by the 2013 permit by requiring the permittee to conduct a wet weather assessment of their collection system. 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 during wet weather conditions and the rationale for including these outfalls.

On or before the expiration date of this permit, the permittee must identify these wet weather outfalls in its written IDDE plan and identify the wet weather outfalls targeted 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.

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- d. **MCM4 - Construction Site Runoff Control:** The draft permit requires the permittees to implement a construction site runoff control program, which includes enacting and enforcing requirements for control of pollutants from construction sites, preconstruction plan review and approval, site inspections, and education for construction site operators. [See Part IV(C)(4) of the permit].

Each permittee must implement and enforce a program to minimize or eliminate pollutants in any stormwater runoff to the regulated small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. 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.

MS4s are required to continue to review and enforce a program to reduce pollutants in stormwater runoff from construction activities that result in a land disturbance equal to or greater than one acre that discharge to the MS4. The overall objective of an effective construction runoff management program is to have a program that minimizes or eliminates erosion and maintains sediment on site.

The construction program required by the GP is different from the MDEP's program that is implemented through the Construction General Permit (CGP), although there is some overlap. The MS4 construction program must address the discharges from construction projects within its jurisdiction that discharge directly to the MS4. A project may need a CGP from the MDEP as well as be regulated under the permittee's construction program.

The permittee must have an enforceable program requiring proper sediment and erosion control. In addition to addressing sediment and erosion control, the program must include controls for other wastes on construction sites such as demolition debris, litter and sanitary wastes. The MDEP encourages permittees to include design standards in local regulations for sediment and erosion control BMPs. The GP cites two guidance documents entitled, *Erosion and Sediment Control, Housekeeping and Inspections and Maintenance* (Attachment D of the permit) and *Maine Erosion and Sediment Control Practices Field Guide For Contractors* (found on the MDEP website) to assist in developing BMPs that could be included as part of the local program.

This GP requires the program to include written procedures for pre-construction review and approval of site plans. Permittees should make every effort to ensure that qualified personnel review plans. In addition, the program must include a procedure for receiving information from the public and taking such information into consideration during the site plan review. The plan review procedures must include consideration of water quality impacts. The MDEP believes the site plan review requirement is a necessary

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step to control the discharge from construction sites that enters the permittee's MS4 and ensures the construction site operators have taken the necessary steps to control stormwater generated on site before the stormwater is discharged to the MS4 system.

The GP requirements build upon the MS4 permit requirements by requiring the program to have procedures for site inspections and enforcement. Qualified personnel should perform inspections. Qualified personnel are those who possess the knowledge and the skills to assess conditions and activities that could impact stormwater quality and who can also evaluate the effectiveness of stormwater control measures. Inspections should occur during construction as well as after construction to ensure that BMPs are installed and operating as described in approved plans. The permittee shall have clearly defined procedures regarding who is responsible for inspections at construction sites and what aspects of the construction site are to be inspected. The permittee must have authority to impose sanctions if construction projects are found not to be in compliance. Sanctions can include monetary penalties, stop work orders, or other remedies authorized by law.

e. **MCM5 - Storm Water Management for New Development and Redevelopment:**

This GP requires that permittees to utilize low impact development techniques and measures for stormwater runoff from areas of new development and redevelopment disturbing one (1) or more acres. One objective of this measure is to have the hydrology associated with new development closely mirror the pre-development hydrology and to improve the hydrology of redevelopment sites through required onsite retention/infiltration or treatment of stormwater. Another objective of this measure is to reduce the concentration and pollutant loadings found in stormwater prior to discharge of stormwater from new and re- development projects within the regulated area. Permittees must ensure that preconstruction plans are reviewed and approved for all new development and redevelopment projects; ensure proper operation and maintenance of permanent stormwater management controls; conduct site inspections; and enforce requirements within their jurisdictional powers [See Part IV(C)(5) of the permit].

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Post construction stormwater runoff may cause two types of impacts. One is an increase in the type and the quantity of pollutants. The alteration of the land by development can increase the discharge of pollutants such as oil and grease (hydrocarbons), heavy metals, solids and nutrients. Another impact occurs with an increase in the quantity of stormwater that is delivered to water bodies during storm events. Increases in impervious area decrease the amount of precipitation that naturally infiltrates into the ground, which provides for natural filtration of many pollutants found in stormwater. The lack of natural infiltration increases the volume of stormwater runoff into water bodies which causes increased flows and increase in sediment loadings in the stream that can cause stream bank scouring, impacts to aquatic habitat, and flooding. The increased pollutant loading associated with increased impervious area will further degrade the receiving waterbodies if new and redevelopment is allowed to continue unmitigated. Planning and design for the minimization of pollutants in post construction stormwater discharges is the most cost-effective approach to stormwater quality management.

The GP contains Attachment D, *Erosion and Sediment Control, Housekeeping and Inspections and Maintenance*, Attachment F, *Low Impact Development BMPs*, as well as guidance entitled *Maine Erosion and Sediment Control Practices Field Guide For Contractors*, found on the MDEP website to assist contractors and municipalities in developing BMPs for the regulatory mechanism.

f. **MCM6 - Good Housekeeping/Operations and Maintenance Program for Municipal Operations:**

The objective of this program is to mitigate or eliminate pollutant runoff from all operations on property that is owned or managed by the permittee. Permittees must properly operate and maintain their stormwater infrastructure to reduce discharges of pollutants. All permittees must ensure that catch basins do not become more than 50% full and sweep their streets and parking lots a minimum of one time per year soon after snow melt. Permittees must maintain Operation and Maintenance (O&M) programs for all properties exposed to stormwater runoff and enact programs to reduce stormwater pollutants through appropriate application of pesticides, herbicides, and fertilizers in all permittee areas, as well as enacting pollution prevention actions at material storage facilities, maintenance yards, and salt storage sites. Additional measures are required at waste handling facilities to reduce pollutants associated with those facilities. (See Part IV(C)(6) of the permit).

The GP includes more detailed requirements than the 2013 permit for the implementation of this control measure. The permittee must develop an inventory of buildings and facilities and update it annually. Permittees are required to develop an operations and maintenance plan for the following permittee-owned activities or facilities: parks and open spaces; buildings and facilities; vehicles and equipment maintenance; and infrastructure (roadways and storm sewer systems). While the 2013

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GP did not require a written operation and maintenance plan for permittee-owned activities or facilities, it did require the development of a program to prevent/reduce pollutant runoff for the same activities or facilities identified above. Creating a written plan is intended to provide more clarity and responsibility for staff when dealing with stormwater runoff from permittee owned property. This GP is also more prescriptive of what certain operation and maintenance plans must contain based on the type of operation at the facility in order to be more protective of water quality than the MS4-2013 permit provisions.

The permittee must consider all buildings it owns for the evaluation of buildings and facilities. The permittee shall evaluate the use and storage of petroleum products, management of dumpsters, and other wastes at permittee owned buildings. In areas where permittee-owned vehicles are stored, the permittee must establish procedures to ensure that vehicles that are leaking or require maintenance are stored indoors to the extent practicable. Fueling areas must be covered unless impracticable. Wash waters from permittee-owned vehicles must not be discharged to the MS4 or directly to a water of the state.

The GP requires the permittee to either establish or continue the implementation of a program to repair and rehabilitate its infrastructure in a timely manner. The GP requires the MS4 to maintain its streets, roads and rights of way in such manner as to minimize the discharge of pollutants from the MS4 including the discharge of chlorides associated with wintertime treatments. Programs such as New Hampshire's Green SnowPro program may helpful in educating maintenance personnel on how and when to apply road salt to meet public safety as well as minimize runoff of chlorides that can degrade water quality. Permittee's must develop and implement a program to inspect all catch basins and, if necessary, at least once every other year, clean catch basins and other stormwater structures that accumulate sediment and dispose of the removed sediments in accordance with current state law. The permittee must clean catch basins more frequently if inspections indicate excessive accumulation of sediment. Excessive accumulation is greater than or equal to 50 percent of the sump filled.

The GP requires street sweeping to occur at least once per year. More frequent sweeping, especially using a high efficiency vacuum sweeper, can have positive impacts on receiving water quality and many permittees may choose increased sweeping frequencies in heavy use areas.

In addition to the operation and maintenance plans required for permittee-owned operations, the permittee must develop a Stormwater Pollution Prevention Plan (SWPPP) for maintenance garages or other waste management facilities. Waste management facilities are those facilities that store material, compost areas, organic debris collection, hazardous waste collection areas, etc. These facilities are targeted in this GP because they can be large generators of stormwater pollution and may not be covered under another MEPDES permit. However, if a facility is already covered by

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Maine's Multi-Sector General Permit (MSGP), the SWPPP required by the MSGP will satisfy this requirement. The SWPPP required by the MSGP shall be referenced in the MS4's SWMP.

The permittee must develop a SWPPP that consists of the following elements;

1. The SWPPP must identify the individuals (by name or title) who comprise the facility's Stormwater Pollution Prevention Team. The Stormwater Pollution Prevention Team is responsible for assisting the facility manager in developing, implementing, maintaining and revising the facility's SWPPP. Responsibilities of each team member must be listed.
2. Nature of activities. The SWPPP must provide a description of the nature of the activities at the facility.
3. Maps. The SWPPP must contain a general location map with sufficient detail to identify the location of the facility and all receiving waters for all stormwater discharges. A site map depicting the following features must also be included with the SWPPP.
 - i. Boundaries of the property and the size of the property in acres;
 - ii. Location and extent of significant structures and impervious surfaces;
 - iii. Directions of stormwater flow (use arrows);
 - iv. Locations of all stormwater BMPs;
 - v. Locations of all receiving waters, including wetlands, in the immediate vicinity of the facility;
 - vi. Locations of all stormwater conveyances including catch basins, ditches, pipes, and swales;
 - vii. Locations of potential pollutant sources;
 - viii. The location of all above ground wastewater or process water containment tanks;
 - ix. For the purposes of the site map, identify areas of frequent spills (greater than three occurrences per year) and large spills (greater than 10 gallons) that have occurred in the last three years. All locations of fuel frequent/large spills must be documented within the SWPPP or applicable Spill Prevention Control & Counter Measure (SPCC) Plan;

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- x. Locations of all stormwater monitoring points;
- xi. Locations of stormwater inlets, outlets, and outfalls, with a unique identification code for each outfall (*e.g.*, Outfall 001, 002) and an approximate outline of the areas draining to each outfall;
- xii. Locations of the following activities where such activities are exposed to precipitation:
 - fueling stations;
 - vehicle and equipment maintenance and/or cleaning areas;
 - loading/unloading areas;
 - locations used for the treatment, storage, or disposal of wastes;
 - liquid storage tanks;
 - processing and storage areas;
 - immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;
 - transfer areas for substances in bulk;
 - machinery; and
 - locations and sources of run-on to the site from adjacent property that contains significant quantities of pollutants.

The permittee must have a signed copy of the SWMP available-at the MS4's office and on the official web site if there is a MS4 website and must make a copy of the SWMP available to the general public and regulatory authorities. The permittee must keep the SWMP current. The permittee must allow the public the opportunity to comment on changes made to the SWMP at a minimum of once per year (1/Year). If there are no changes to the SWMP no opportunity for public comment is necessary. Posting the SWMP on the MS4's website or at the MS4's office for comment at any time is acceptable to meet the once per year (1/Year) requirement. The MS4 does not need to publish a notice in a local newspaper to fulfill this requirement.

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D. Impaired Waters & Total Maximum Daily Loads

The EPA has approved a number of Impervious Cover (IC) TMDLs in Maine in which waste load allocations (WLAs) have been developed. If the waterbody to which a point source discharge drains is impaired and has an EPA approved TMDL, then the point source discharge must be consistent with the TMDL WLA and any implementation plan. This GP does not authorize a direct discharge that is inconsistent with the WLA of an approved TMDL.

This GP is utilizing the adaptive management approach to address waterbody impairments. Appendix B of the GP contains a list of Urban Impaired Streams (UISs). This GP requires the permittee to fully implement at least three structural or non-structural BMPs to address the impairment. These proposed BMPs and other BMPs will be established in the final permittee specific MDEP Order.

For point source discharges to impaired waterbodies without an approved TMDL, the permittee must consult with the Department's Division of Environmental Assessment to identify the root cause(s) of the impairment and develop a strategy reduce the discharge of pollutants of concern if the permittee is causing or contributing to the impairment.

E. Record Keeping and Annual Reporting

1. Record Keeping

The permittee must keep all records required by this permit for a period of five years from the date the record is generated. The SWMP must be available to members of the public who request a copy.

2. Annual Compliance Reporting

The permittee must submit an annual report by September 15th of each calendar year. The reporting period will be a one-year period commencing on the permit effective date, and subsequent anniversaries thereof. The report must include a self-assessment regarding compliance with the terms of the GP, the appropriateness of selected BMPs, and the progress towards achieving the permittee identified measurable goals. The report must also contain a summary of any information that has been collected and analyzed. This includes all data. The permittee must also indicate what activities are planned for the next reporting cycle and discuss any changes to either BMPs or measurable goals. The report must indicate if any control measure or measurable goal is the responsibility of another entity. [See Part IV(G) of the GP]

PART III - DEPARTMENT CONTACTS

Additional information concerning this permitting action may be obtained from, and written comments sent to:

Gregg Wood
Division of Water Quality Management
Bureau of Water Quality
Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017
e-mail: gregg.wood@maine.gov
Telephone: (207) 287-7693

PART IV - RESPONSE TO COMMENTS

During the period July 16, 2021 – August 16, 2021, the MDEP made the proposed draft MEPDES permit/WDL available for a formal 30-day public comment period, consistent with the MEPDES rules. The MDEP received written comments from the Friends of Casco Bay (FOCB) and Stillwater Environmental Engineering, Inc. (SEEI). Responses to comments received are as follows:

Comment #1 (FOCB) – MCM#1 – Public Education - The commenter stated “Most of the state entities regulated under this permit are educational institutions. We have observed students on the Southern Maine Community College (SMCC) and University of Southern Maine campuses, sitting in their cars for long periods of time idling their engines. The exhaust emitted from their vehicles contains nitrogen oxides (NOx), which collect on pavement and, during storms, are flushed through MS4 systems into waterways where they fertilize nuisance and possibly harmful algal blooms. For example, a storm sewer system from an SMCC parking lot near our office drains to a small beach along the Bay. This beach experiences nuisance algal blooms after storms during warm weather. We can identify no other nitrogen sources in the area. This MCM could target messaging to reduce idling and thereby help reduce nuisance algal blooms that degrade water quality.”

Response #1 - The Department is reluctant to steer a permittee into focusing on one particular area of concern. The language in this section of this permit is meant to have permittee’s look at a wide range of educational/outreach tools to get the message out on reducing or eliminating pollution from a number of sources not just from idling vehicles. The Department will forward this particular concern to the environmental coordinators at SMCC and USM for consideration when preparing their SWMPs which the FOCB will also have the opportunity to comment on.

PART IV - RESPONSE TO COMMENTS (cont'd)

Comment #2 (FOCB) - MCM 2: Public Involvement and Participation – The commenter stated “This control measure should include more measures to engage the public and students in the MS4 process.

Response #2 - The first paragraph of this section on page 24 of the permit meets the commenters recommendation above as it states;

The objective of this minimum control measure is to involve the facility’s community in both the planning and implementation process of improving water quality and reducing storm water quantity via the storm water program. A program planned with a stakeholder group is more likely to be successful in achieving its goals. The population within the MS4 can provide valuable input and assistance to a MS4’s storm water management program. Therefore, the MS4 community must be given opportunities to play an active role in both the development and implementation of the program. An active and involved MS4 community is crucial to the success of a storm water management program because it allows for broader support, additional expertise and a conduit to other programs. The MS4 community members are also more likely to apply these lessons/BMPs at home.

Comment #3 (FOCB) - MCM 5: Post Construction Stormwater Management in New Development and Redevelopment – The commenter states “This MCM should ensure that new development will mimic pre-development hydrology to the maximum extent practicable and that re-development will reduce and treat existing pollutant loads. The clear, specific, and measurable terms added to this permit appear to advance the tenets of the Remand Rule and goals of the CWA, but could be strengthened by adding the above language.”

Response #3 - Page 2 of Attachment F, *Chapter 10 – Low Impact Development Practices*, under the paragraph entitled, *Maintain Time of Concentration*, speaks to mimicking pre-development hydrology to the maximum extent practicable and that re-development will reduce and treat existing pollutant loads.

Comment #4 (FOCB) - MCM 6: Pollution Prevention/Good Housekeeping for Facility Operations – The commenter states “The permit should augment the employee training to include education regarding how and when to apply road salt without undue risks to public safety. New Hampshire’s Green SnowPro program or the programs around Lake George in New York state may serve as models. The second step permit should include a plan to reduce chlorides pollution to prevent impermissible degradation of water quality or contribution to a violation of water quality standards for impaired waters.”

Response #4 - A reference to the management of road salts has been added to paragraph number three on page 25 of the Fact Sheet.

PART IV - RESPONSE TO COMMENTS (cont'd)

Comment #5 (FOCB) - Discharges to Impaired Waters – The commenter states “Paragraph 1 of this section should be identical to paragraph 3. Small state and federal MS4s should be required to adopt three measures, in addition to what they are doing to meet other permit requirements, to begin to restore all impaired waters to which they discharge stormwater. These measures should be in the second step permit, not just in the storm water management plan (SWMP). The SWMP is not an enforceable document. This section of the permit should be harmonized to be consistent with any changes made to the MS4 General Permit for Municipalities currently on appeal.”

Response #5 - Paragraph 1 of the permit as drafted is consistent with the language that the FOCB requested be put back into the final municipal MS4 permit. The appeal of the municipal MS4 permit by the FOCB requested the words *clear, specific and measurable* that were absent in the final municipal MS4 permit be placed back into that section of the permit. The appeal of the municipal MS4 permit was heard on June 17th and the BEP remanded that paragraph of the permit back to the Department to incorporate the words *clear, specific and measurable*. The Department agreed to the revision and the permit modification was issued as a final document on November 23, 2021. The commenter is correct that the SWMP is not an enforceable document and the second step of the permit is the vehicle to establish the clear, specific and measurable actions to comply with the TMDL waste load allocation and implementation plan.

Comment #6 (SEEI) – MCM 3 – Illicit Discharge Detection and Elimination (IDDE) Program, last two paragraphs on Page 29 of the permit. The commenter states – “The first paragraph implies that the wet weather monitoring won’t start until the next permit cycle. The second paragraph states the monitoring could start before that based on when the IDDE plan is completed. We suggest clarifying this section.”

Response #6 – At a minimum, each permittee must identify the wet weather outfalls that are to be sampled during the next permit cycle. Given the complexity (or lack thereof) of issues for each permittee, some permittees may be able to complete the wet weather assessment plans in year 3, 4 or 5 of this permit cycle. If this is the case, the permit is requiring the permittees to move forward on the sampling plan during the term of this permit and not put implementation of the plan off until the next permit cycle. The Department does not see the need to provide additional clarification of the permit language. Therefore, the final language remains unchanged.

Comment #7 (SEEI) – MCM 5 – Post Construction Stormwater Management in New Development and Redevelopment – The commenter states “The municipal permit does not include maximum extent practicable so why does the state/federal? We suggest removing the MEP language and keeping content stated in the second sentence of the paragraph, so that the section reads: Permittees must develop or update their enforceable program to require that is at least as stringent as the LID techniques found in Appendix F of this permit, unless such techniques are infeasible on site. The commenter is referring to paragraph 5(a)(i) on the bottom of page 32 of the permit.

Response #7 - To promote consistency with the final municipal MS4 permit modification issued by the Department on November 23, 2021, this section of the permit is being revised as follows:

PART IV - RESPONSE TO COMMENTS (cont'd)

5. MCM5 - Post-Construction Stormwater Management in New Development and Redevelopment.

Each permittee must implement and enforce a program to address post construction stormwater runoff to the maximum extent practicable 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 that discharge into the MS4.

- a. The permittee must implement strategies which include a combination of structural and/or non-structural BMPs appropriate to prevent or minimize water quality impacts.
 - i. **On or before the effective date of this permit (October 1, 2022)**, each permittee must develop and begin implementation of an enforceable program for stormwater management on new and redevelopment sites which establishes performance standards that are at least as stringent as the LID techniques contained in Table 1 of Attachment F of this permit unless such techniques are infeasible on a site. The enforceable program should, at a minimum, refer to Attachment F for guidance.

Comment #8 (ESSI) – **E. Discharges to Impaired Waters** – The commenter stated “We suggest reducing the number of required UIS BMPs for state and federal facilities to be commensurate with their smaller impact (as compared to municipalities). Suggest changing the language to....The permittee must propose and fully implement at least one structural or non-structural BMP or equivalent measure or assist the municipality that UIS is within with at least one of their BMPs to be considered for inclusion in the permittee specific DEP order.”

Response #8 – To be consistent with the municipal MS4 and the transportation MS4 General Permits, the language for requiring three structural or non-structural BMPs remains unchanged in final permit. As the commenter stated, the permit provides the flexibility for the state and federal permittees to assist the municipalities in proposing one, two or all three BMPs collectively.

Comment #9 (ESSI) – The commenter stated “Will the date for submission of the Notice of Intent (NOI) form be moved from December 31, 2021 to a later date given the delay in issuance of the final permit?”

Response #9 – Yes, the date for submission of the NOI forms has been modified from December 31, 2021 to March 1, 2022 given the delay in issuance of this final permit. The delay was a result of a modification to Attachment F, *Guidance, Low Impact Development (LID)*. Attachment F was modified in a permit modification (November 23, 2021) to settle an appeal of the small MS4 General Permit issued on October 15, 2020. To promote consistency between the two permits, the issuance of this permit was delayed until the small MS4 permit was finalized.



DEP INFORMATION SHEET

Appealing a Department Licensing Decision

Dated: November 2018

Contact: (207) 287-2452

SUMMARY

There are two methods available to an aggrieved person seeking to appeal a licensing decision made by the Department of Environmental Protection's (DEP) Commissioner: (1) an administrative process before the Board of Environmental Protection (Board); or (2) a judicial process before Maine's Superior Court. An aggrieved person seeking review of a licensing decision over which the Board had original jurisdiction may seek judicial review in Maine's Superior Court.

A judicial appeal of final action by the Commissioner or the Board regarding an application for an expedited wind energy development (35-A M.R.S. § 3451(4)) or a general permit for an offshore wind energy demonstration project (38 M.R.S. § 480-HH(1)) or a general permit for a tidal energy demonstration project (38 M.R.S. § 636-A) must be taken to the Supreme Judicial Court sitting as the Law Court.

This information sheet, in conjunction with a review of the statutory and regulatory provisions referred to herein, can help a person to understand his or her rights and obligations in filing an administrative or judicial appeal.

I. ADMINISTRATIVE APPEALS TO THE BOARD

LEGAL REFERENCES

The laws concerning the DEP's *Organization and Powers*, 38 M.R.S. §§ 341-D(4) & 346; the *Maine Administrative Procedure Act*, 5 M.R.S. § 11001; and the DEP's *Rules Concerning the Processing of Applications and Other Administrative Matters* ("Chapter 2"), 06-096 C.M.R. ch. 2.

DEADLINE TO SUBMIT AN APPEAL TO THE BOARD

The Board must receive a written appeal within 30 days of the date on which the Commissioner's decision was filed with the Board. Appeals filed more than 30 calendar days after the date on which the Commissioner's decision was filed with the Board will be dismissed unless notice of the Commissioner's license decision was required to be given to the person filing an appeal (appellant) and the notice was not given as required.

HOW TO SUBMIT AN APPEAL TO THE BOARD

Signed original appeal documents must be sent to: Chair, Board of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017. An appeal may be submitted by fax or e-mail if it contains a scanned original signature. It is recommended that a faxed or e-mailed appeal be followed by the submittal of mailed original paper documents. The complete appeal, including any attachments, must be received at DEP's offices in Augusta on or before 5:00 PM on the due date; materials received after 5:00 pm are not considered received until the following day. The risk of material not being received in a timely manner is on the sender, regardless of the method used. The appellant must also send a copy of the appeal documents to the Commissioner of the DEP; the applicant (if the appellant is not the applicant in the license proceeding at issue); and if a hearing was held on the application, any intervenor in that hearing process. All of the information listed in the next section of this information sheet must be submitted at the time the appeal is filed.

INFORMATION APPEAL PAPERWORK MUST CONTAIN

Appeal materials must contain the following information at the time the appeal is submitted:

1. *Aggrieved Status.* The appeal must explain how the appellant has standing to maintain an appeal. This requires an explanation of how the appellant may suffer a particularized injury as a result of the Commissioner's decision.
2. *The findings, conclusions, or conditions objected to or believed to be in error.* The appeal must identify the specific findings of fact, conclusions regarding compliance with the law, license conditions, or other aspects of the written license decision or of the license review process that the appellant objects to or believes to be in error.
3. *The basis of the objections or challenge.* For the objections identified in Item #2, the appeal must state why the appellant believes that the license decision is incorrect and should be modified or reversed. If possible, the appeal should cite specific evidence in the record or specific licensing requirements that the appellant believes were not properly considered or fully addressed.
4. *The remedy sought.* This can range from reversal of the Commissioner's decision on the license or permit to changes in specific permit conditions.
5. *All the matters to be contested.* The Board will limit its consideration to those matters specifically raised in the written notice of appeal.
6. *Request for hearing.* If the appellant wishes the Board to hold a public hearing on the appeal, a request for public hearing must be filed as part of the notice of appeal, and must include an offer of proof in accordance with Chapter 2. The Board will hear the arguments in favor of and in opposition to a hearing on the appeal and the presentations on the merits of an appeal at a regularly scheduled meeting. If the Board decides to hold a public hearing on an appeal, that hearing will then be scheduled for a later date.
7. *New or additional evidence to be offered.* If an appellant wants to provide evidence not previously provided to DEP staff during the DEP's review of the application, the request and the proposed evidence must be submitted with the appeal. The Board may allow new or additional evidence, referred to as supplemental evidence, to be considered in an appeal only under very limited circumstances. The proposed evidence must be relevant and material, and (a) the person seeking to add information to the record must show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process; or (b) the evidence itself must be newly discovered and therefore unable to have been presented earlier in the process. Specific requirements for supplemental evidence are found in Chapter 2 § 24.

OTHER CONSIDERATIONS IN APPEALING A DECISION TO THE BOARD

1. *Be familiar with all relevant material in the DEP record.* A license application file is public information, subject to any applicable statutory exceptions, and is made easily accessible by the DEP. Upon request, the DEP will make application materials available during normal working hours, provide space to review the file, and provide an opportunity for photocopying materials. There is a charge for copies or copying services.
2. *Be familiar with the regulations and laws under which the application was processed, and the procedural rules governing your appeal.* DEP staff will provide this information on request and answer general questions regarding the appeal process.
3. *The filing of an appeal does not operate as a stay to any decision.* If a license has been granted and it has been appealed, the license normally remains in effect pending the processing of the appeal. Unless a stay of the decision is requested and granted, a license holder may proceed with a project pending the outcome of an appeal, but the license holder runs the risk of the decision being reversed or modified as a result of the appeal.

WHAT TO EXPECT ONCE YOU FILE A TIMELY APPEAL WITH THE BOARD

The Board will formally acknowledge receipt of an appeal, and will provide the name of the DEP project manager assigned to the specific appeal. The notice of appeal, any materials accepted by the Board Chair as supplementary evidence, any materials submitted in response to the appeal, and relevant excerpts from the DEP's application review file will be sent to Board members with a recommended decision from DEP staff. The appellant, the license holder if different from the appellant, and any interested persons are notified in advance of the date set for Board consideration of an appeal or request for public hearing. The appellant and the license holder will have an opportunity to address the Board at the Board meeting. With or without holding a public hearing, the Board may affirm, amend, or reverse a Commissioner decision or remand the matter to the Commissioner for further proceedings. The Board will notify the appellant, the license holder, and interested persons of its decision.

II. JUDICIAL APPEALS

Maine law generally allows aggrieved persons to appeal final Commissioner or Board licensing decisions to Maine's Superior Court (see 38 M.R.S. § 346(1); 06-096 C.M.R. ch. 2; 5 M.R.S. § 11001; and M.R. Civ. P. 80C). A party's appeal must be filed with the Superior Court within 30 days of receipt of notice of the Board's or the Commissioner's decision. For any other person, an appeal must be filed within 40 days of the date the decision was rendered. An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. See 38 M.R.S. § 346(4).

Maine's Administrative Procedure Act, DEP statutes governing a particular matter, and the Maine Rules of Civil Procedure must be consulted for the substantive and procedural details applicable to judicial appeals.

ADDITIONAL INFORMATION

If you have questions or need additional information on the appeal process, for administrative appeals contact the Board's Executive Analyst at (207) 287-2452, or for judicial appeals contact the court clerk's office in which your appeal will be filed.

Note: The DEP provides this INFORMATION SHEET for general guidance only; it is not intended for use as a legal reference. Maine law governs an appellant's rights.



APPENDIX D

BASWG REGIONAL STORMWATER MANAGEMENT PLAN



**Municipal Separate Storm Sewer System (MS4)
Regional Stormwater Management Plan (SWMP)
for the Bangor Area Stormwater Group (BASWG)**

**For Small Municipal Separate Storm Sewer Systems (MS4)
MER041000 Final Permit Dated October 15, 2020 and effective
July 1, 2022 - June 30, 2027**

First Submitted to Maine DEP: March 26, 2021

Last Revised: June 18, 2021

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1.0 Introduction

This section of the plan describes the Maine MS4 Program, the BASWG’s regional plan, permit requirements around initial and modified plans. It also includes information on how the plan will be implemented, made available to the public, and updated over time. This section of the plan concludes with key contacts for the BASWG membership, executive committee, the BASWG’s organizational structure, and a map of the Bangor Urbanized Area (BUA).

1.1. MS4 Program

The Maine Department of Environmental Protection (MDEP) reissued the Municipal Separate Storm Sewer System (MS4) General Permit (GP) on July 1, 2022 (included as Attachment A). The GP 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 GP only covers operations or activities associated with stormwater runoff within the identified EPA-designated Urbanized Area of each regulated MS4. The GP requires that permittees shall develop, implement, and enforce a Stormwater Management Plan (SWMP) that is designed to reduce or eliminate polluted stormwater runoff to the maximum extent practicable from its regulated MS4.

1.2 Regional Plan Development

This Regional SWMP was developed in accordance with the terms and conditions of the MDEP General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4) MER041000 Final Permit Dated October 15, 2020, and becomes effective on July 1, 2022. The GP required the following six Minimum Control Measures (MCMs) be addressed in a SWMP.

- I. Public Education and Outreach on Stormwater Impacts
- II. Public Involvement and Participation
- III. Illicit Discharge Detection and Elimination
- IV. Construction Site Stormwater Runoff Control
- V. Post-Construction Stormwater Management in New and Re-development
- VI. Pollution Control/Good Housekeeping for Municipal Operations

During the previous MS4 permit cycles (2003-2021), the twelve municipal or federally owned MS4s located in the Bangor Urbanized Area (BUA) of Maine decided to develop a Regional SWMP. The purpose of the regional SWMP was to take advantage of ongoing MS4 permit compliance activities that were performed in an efficient, collaborative effort. The MDEP supported the development of multiple cycles of regional SWMPs in the BUA, recognizing that regional collaboration among the regulated MS4s has proven to be an effective means of achieving compliance. Notably, the BASWG members have selected to collaborate on those

MCMs which evaluation has shown regionalization increases efficiency, effectiveness and reduces costs to MS4s.

As a result, this Regional SWMP is limited to collaborative work on two MCMs:

- I. Public Education and Outreach on Stormwater Impacts
- II. Public Involvement and Participation

As of the submission of this plan, the MDEP has yet to finalize the 2022 MS4 General Permit for state or federally owned MS4 facilities. BASWG has a total of five members that are regulated under the state or federally owned MS4 General Permit (the Dorothea Dix Psychiatric Center, Eastern Maine Community College, the Maine National Guard, the University of Maine Augusta – Bangor Campus, and the University of Maine). The BMPs included in this plan were developed following the requirements associated with the 2021 General Permit for the Discharge of Stormwater from Small MS4s, and therefore, may not be entirely applicable to state or federally owned facilities. Given this, these MS4s will comply with all BMPs included in this plan that are relevant to their permit, once it is available. If following the release of the state or federally owned MS4 General Permit, additional BMPs are required, these will be included as an attachment to this plan and submitted to MDEP for approval.

1.3 Initial and Modified SWMPs

As required in Part IV.A, this plan represents the BASWG’s initial SWMP and is submitted to MDEP with a Notice of Intent (NOI) describing how the BASWG will implement the plan. The initial plan will be updated within 60 days of the initial plan authorization by MDEP to document how the BASWG will meet the requirements of the MDEP order.

In compliance with requirements in Part IV.B, a modified SWMP will be developed and submitted to MDEP within 60 days of permit authorization to include how the BASWG will meet all requirements in the MDEP order. The modified SWMP will include a summary of the comments received during the MS4s public comment period and any corresponding changes to the SWMP made in response to the comments. The BASWG will submit the updated SWMP to MDEP indicating how the BASWG has modified the SWMP to be consistent with the GP and permittee-specific MDEP order. BASWG will file an application on a MDEP form with the MDEP that includes a justification to formally modify the original permittee-specific MDEP order.

1.4 SWMP Implementation

This Regional SWMP should be implemented in conjunction with individual SWMPs developed independently with each of the twelve (12) regulated MS4 entities within the BUA (submitted under separate cover). This SWMP addresses all Best Management Practices (BMPs) for specific MCMs that will be implemented as a collaborative group effort to comply with the current issuance of the MS4 GP. Individual permittees in the BUA will continue to participate in

and support regional BMPs that are outlined in the Regional SWMP. Each individual MS4 is responsible for meeting the terms and conditions of the GP. Each regulated MS4 in the Greater Bangor Urbanized Area acknowledges that they must meet the requirements of the GP. This plan provides a regional methodology for accomplishing what each individual MS4 is responsible to do independently. No MS4 will be responsible for the non-compliance of another. Individual MS4s will be held accountable for participating in regional activities in order to be given credit for group activities in annual reporting to MDEP. Responsible parties and primary contacts are listed in Section 2.0 of this SWMP for each member MS4.

1.5 Plan Availability and Keeping Plans Current

In compliance with Part IV.B.1, a signed copy of the BASWG’s modified SWMP will be available in each BASWG member MS4 office and on each MS4 website. Each MS4 must make a copy of the SWMP available upon request to EPA, the operator of any MS4 with an adjacent or interconnected storm sewer system, a public water supply company (if the MS4 stormwater discharges to a supply watershed), and members of the public. The BASWG will keep the SWMP plan current. The BASWG will allow the public to comment on any changes to the SWMP at a minimum of once per year (Part IV.B.2.).

2.0 BASWG Information

BASWG Member Organizations and Primary Contact Person

City of Bangor	Richard May, Stormwater Utility Technician
City of Brewer	Kenneth Locke, Director of Environmental Services
Town of Hampden	Victor Smith, Public Works Director
Town of Milford	Sarah Comeau, Town Administrator
Town of Orono	Belle Ryder, Assistant Town Manager
City of Old Town	John Rouleau, Director of Public Works
Town of Veazie	Mark Leonard, Town Manager
Dorothea Dix Psychiatric Center	Mark Faulkner, Facilities Management
Eastern Maine Community College	George Hanson, Facilities Maintenance Engineer
Maine Air National Guard	Chris Cronin, Federal Environmental Manager
University of Maine	Jodi Munster, Assistant Director of Administration and Environmental Compliance
University of Maine Augusta Bangor Campus	Patrick Decker, Facilities Maintenance Manager

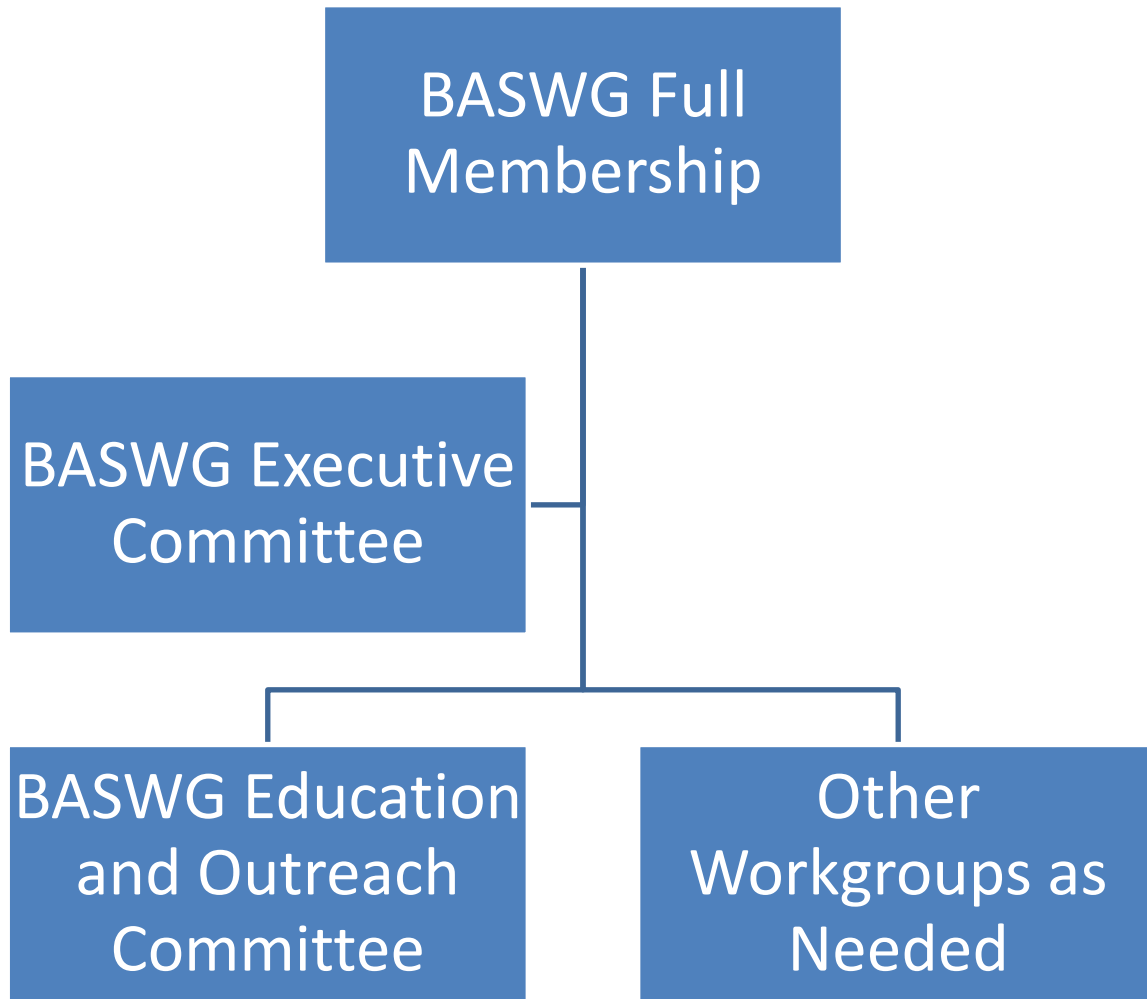
BASWG Executive Committee – As of March 2021

- Chair – Richard May, City of Bangor
- Vice Chair – John Rouleau, City of Old Town
- Secretary – Victor Smith, Town of Hampden
- Treasurer – Kyle Drexler, Town of Orono

BASWG Facilitator

- Brenda Zollitsch, Facilitator, Bangor Area Stormwater Group Consultant Facilitator

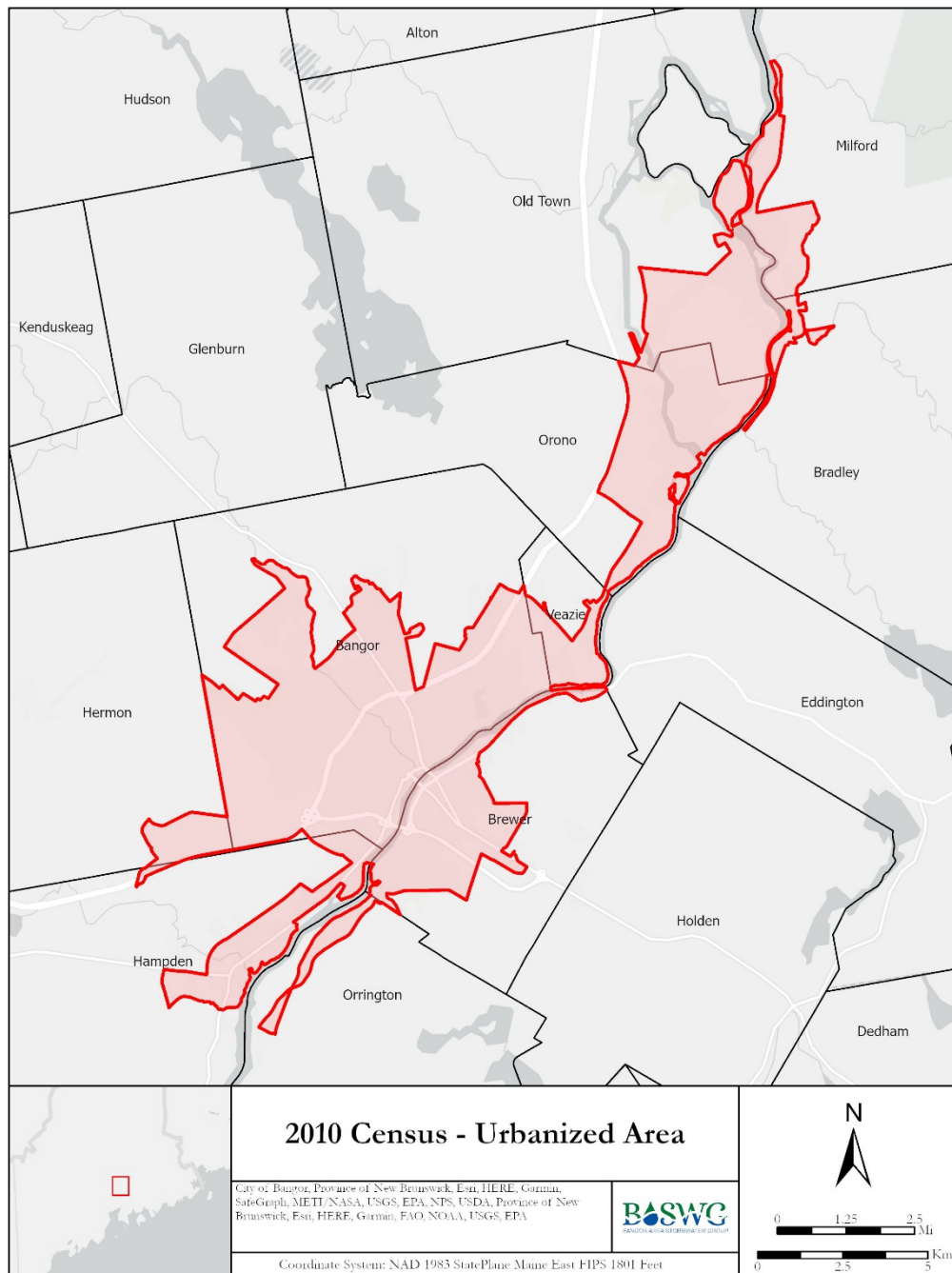
BASWG Organizational Structure



2.1. Urbanized Area Map

The Greater Bangor Urbanized Area Map was developed from the inclusive sum of the United States Census Bureau census conducted in 2003 and 2010 and is included in Figure 1.

Figure 1. Bangor Urbanized Area Map



3.0 Minimum Control Measures

This plan includes for each of the MCMs the following information:

1. Measurable goals by which the BMP will be evaluated.
2. The responsible parties for implementing the BMP
3. The date by which the BMP will be implemented, including as appropriate, timelines and milestones for implementation.

3.1 MCM 1: Education/Outreach Program

The BASWG will develop and implement an ongoing Education/Outreach Program addressing discharges and impacts on water bodies and steps that can be taken to reduce pollutants in stormwater runoff. The BASWG's program is designed to address stormwater issues of significance. The ultimate goal is to educate the audience and change the behavior of the target audiences so that pollutants in stormwater are reduced. *Each BMP is labeled with a reference to MS4 Permit numbering.*

BMP 1.g.1. Outreach to Raise Awareness Campaign of Stormwater Pollution Issues

Description: The BASWG will develop a campaign to raise awareness of stormwater pollution issues targeted at the general public and one additional audience (municipal, commercial, development/construction; or institutions).

This campaign will consist of two campaigns during the term of the permit:

1. A campaign targeted to the general public; and
2. Another campaign targeted to one of the audiences cited above.

Campaign Targeted to the General Public

This general public outreach campaign has been developed to increase awareness of stormwater pollution, its sources, impacts, and personal actions members of the public can take to reduce it. The campaign has been designed to make measurable gains in awareness based on metrics listed under the evaluation section of this campaign plan.

Target Audience

The BASWG will conduct outreach to the general public, targeting residents of the Greater Bangor Urbanized Area (BUA) ages 25-55.

Specific Messages

1. Stormwater is rain and snow melt that could carry pollutants to our local waterways and lakes.
2. Most stormwater is not “treated” before it is released to the nearest waterbody.
3. Stormwater sewers are different from sanitary sewers, which flow through closed systems to a water treatment plant.
4. Residents must be mindful of what enters our stormwater systems and reduce/eliminate the entry of items that contribute to stormwater pollution.
5. Stormwater can become contaminated with many different pollutants, including those associated with sediment, automotive care, industrial practices, salt, and litter.
6. There are many ways to prevent stormwater pollution, including actions that can be taken at the individual level to reduce stormwater pollution:
 - a. reducing chloride applications during winter maintenance,
 - b. picking up litter and pet waste and properly disposing of them,
 - c. lawncare practices that reduce the use of chemicals, etc.)
7. A community effort to keep stormwater free from pollutants will contribute to clean local waterways.

Message Delivery/Implementation Tools

The BASWG’s outreach to the general public will deliver at least three (3) of the following outreach tools per year:

- **Outreach Tool #1:** Online digital marketing campaigns that use purchased ads on search engines (e.g. Google ads), and social media (e.g. “boosted” posts) to drive targeted users to electronic landing pages with additional information on stormwater pollution and prevention, including the BASWG’s website and online landing pages. These ads seek to provide outreach to both existing BASWG social media followers and non-followers in the Bangor UA.
- **Outreach Tool #2:** The use of social media (e.g. BASWG’s Facebook, Twitter and Instagram accounts) as a regular outreach tool, including delivery of targeted messaging through ongoing use of strategically-timed, seasonally-focused content on stormwater pollution prevention. These posts are designed to provide outreach to both current followers and, through paid “boosts” to attract new viewers and followers as specified in Outreach Tool #1.
- **Outreach Tool #3:** Distribution and display of stormwater outreach printed materials in public areas. Flyers and stickers will be available for the public to take at events, such as the Maine Science Festival, (once in-person events resume, as COVID-19 pandemic restrictions end and the public can safely gather again). One informational poster will be displayed in each member’s MS4 public-serving offices where they can be viewed by visitors to the offices.

- **Outreach Tool #4** (i.e. COVID-19 pandemic safety concerns can be met): Engagement of the public at targeted in-person events, including the BASWG’s participation in the Maine Science Festival and other BASWG public events that are part of BASWG’s targeted behavior change events, such as street and stream clean-ups and stormdrain marking events with the public or schools. BASWG MS4s have built a strong relationship with community members through in person stormwater outreach events. These events have the ability to provide face-to-face messaging and affirm citizen engagement on the issue.

Optional additional outreach activities that may augment required outreach activities:

1. Links on BASWG sites to the Thinkblumaine.org website, Yardscapers website, and other relevant web resources where additional stormwater messaging resides.
2. Messaging on street and stream clean-up event t-shirts and other giveaway items.

Measurable Goals:

1.g.1.	The BASWG will conduct a campaign to raise awareness of stormwater pollution issues targeted at the general public
1.h.1.	The BASWG will conduct baseline evaluation prior to each outreach campaign
1.h.2.	The BASWG will conduct an evaluation in PY5 of this permit to assess the overall effectiveness of the program.

Responsible Party – BASWG Executive Committee

Evaluation Methods

General Public Outreach Campaign evaluation will include an online survey of the general public and electronic media analytics on exposure, use, and engagement.

The BASWG may collect data for both general public outreach and behavior change using the same or different evaluation instruments in PY1 and PY5, or at any time evaluation occurs prior to a new outreach or behavior change activity.

- **Evaluation Mechanism 1: Online Survey of the General Public:** The BASWG will build on its successful, research-based survey tool to gather data on public awareness of the general public in the Greater Bangor Urbanized Area. The survey will be delivered via Survey Monkey or another online survey mechanism. The survey will be disseminated to the campaign’s target audience through online outreach, including the BASWG website, social media, push prompts, MS4 websites, and other mechanisms.

Measurable Goals:

The BASWG secured guidance on what an achievable impact would be from the proposed outreach activities. Pulse Marketing from Bangor has advised the BASWG to set outreach goals as a 10% increase¹ between a PY1 baseline and PY5.

- 10% increase in **general awareness** of stormwater pollution between the baseline established in PY1 and the evaluation in PY5.
- 10% increase in awareness of **impacts** of stormwater pollution between the baseline established in PY1 and the evaluation in PY5.
- 10% increase in awareness of **individual actions** that can be taken to reduce stormwater pollution between the baseline established in PY1 and the evaluation in PY5.

- ***Evaluation Mechanism 2: Electronic Media Analytics:***

The BASWG will collect and evaluate the following information annually, with baseline data collected in PY1 and summative analysis of the five-year cycle conducted in PY5.

A. BASWG Targeted Online Display Ad Campaigns

The BASWG will include a survey on each ad campaign landing page,

- Including specific questions around their awareness of stormwater pollution, its sources, impacts, and actions that can be taken to reduce it.

The BASWG will also document the following analytics:

- The number and content of the individual seasonal ad campaigns that are delivered;
- The number of individuals that view each of BASWG's outreach campaign online advertisements;
- The number and percentage of individuals that click through to the BASWG targeted messages to each campaign's landing pages; and
- Amount of time individuals spend viewing content via landing page;
- The number and percentage of individuals that interact with each campaign's landing page content.

B. BASWG Social Media Accounts and Posts

The BASWG will document and analyze the following social media analytics:

- Descriptive information about targeted social media outreach content;
- Number of Visitors to each social media platform (e.g., Facebook, Twitter, Instagram); Number of followers for each social media platform;
- Audience growth of each social media platform over the reporting period;

¹ A 10% increase would mean either a 10% increase in the number of correct answers to the survey questions (i.e. 100 to 110) or a 10% increase in the percentage of correct answers (i.e. 30% to 33%).

- Number of click-throughs for any targeted social media posts designed to take the user to another landing page or site; and
- Information on which social media posts garnered the greatest number of views, engagements, and shares.

C. Interactions with BASWG.org Website

The BASWG will document and analyze the following website analytics:

- Descriptive information about targeted website outreach content;
- Number of unique website users;
- Number of return users;
- Number of click-throughs to additional pages on the website; and
- Data on which website pages are visited the most often.

- **Evaluation Mechanism 3: In-person Events**

In-person Events will include the following additional measures:

The BASWG will document for each event annually:

- Number of event participants;
- MS4 representative staff involvement in the event;
- Messages shared with the public at the event;
- Anecdotal feedback from participants in the event.

Implementation Schedule

During each permit year, three of the four outreach tools will be used. A baseline evaluation will be conducted in PY1 and an impact evaluation in PY5, utilizing evaluation mechanisms 1, 2 and 3.

Second Outreach Campaign

BASWG members have decided that this second outreach campaign will be undertaken individually by each MS4 member entity. However, over the permit period, MS4s may consider coordination and collaboration to meet this permit requirement.

Measurable Goals:

BMP 1.h.1.	The BASWG will include Second Outreach Campaign Measures for individual MS4s, if requested, in its baseline evaluation in PY1
BMP 1.h.2.	The BASWG will include Second Outreach Campaign Measures for individual MS4s, if requested, in its PY5 evaluation to assess the overall effectiveness of individual MS4 second outreach campaigns.

BMP 1.g.2. Outreach to Change Behavior Campaign

The BASWG will develop a campaign to promote and reinforce desirable behaviors designed to reduce stormwater pollution. This campaign will promote at least one behavior change to two audiences using a minimum of three different outreach tools per year.

Campaign to Reduce Stormwater Pollution from Chlorides

Background

Chlorides are a major component of winter road maintenance for snow and ice removal. Chloride pollution likely contributes to the detriment of water quality in stormwater. This campaign will build on efforts over the last permit cycle to make MS4 winter maintenance decision-makers aware of the negative impacts of chlorides on local waters and actions that can be taken to reduce chloride impacts.

For these reasons, the BASWG will conduct a behavior change campaign to address chloride pollution in the Greater Bangor Urbanized Area. The campaign has been designed to reduce chloride use in the UA by promoting behaviors that maximize the effectiveness of deicing products. Chloride reductions must be balanced with Public Safety concerns as the public has come to expect clear roads shortly after winter storm events.

The BASWG's behavior change campaign will focus on two different target audiences:

- 1) MS4 entity winter maintenance managers (WMMs) from the 12 regulated MS4s within the Greater Bangor Urbanized Area, and
- 2) Homeowners aged 25-55 years who manage their own snow and ice removal within the Greater Bangor Urbanized Area.

Measurable Goals

BMP 1.g.1.	The BASWG will conduct two campaigns to change winter maintenance behaviors that contribute to stormwater pollution (one targeted at MS4 Winter Maintenance Managers and one targeted at Homeowners)
BMP 1.h.1.	The BASWG will conduct baseline evaluation prior to each targeted behavior change campaign
BMP 1.h.2.	The BASWG will conduct an evaluation in PY5 of this permit to assess the overall effectiveness of the behavior change campaigns.

Behavior Change Campaign Target Audience 1: MS4 Winter Maintenance Managers

The BASWG will support MS4 winter maintenance managers in self-assessment of their winter maintenance practices. This self-assessment will foster the desired behavior change of the

adoption, or increase in adoption, of best management practices (BMPs) to reduce chloride pollution in the region's waters.

Target Audience: The BASWG's first behavior change target audience is MS4 winter maintenance managers (or winter maintenance contractor supervisor if the MS4 does not have winter maintenance managers) that provide services to the MS4 from the 12 regulated MS4s within the BUA. This target audience shall hereafter be referred to as winter maintenance managers, or WMM.

Behavior Change Message Delivery/Implementation Tools

Behavior change messages will be delivered to MS4 employee WMMs. In MS4s where winter maintenance activities are completed through a contractor, WMMs will modify their winter maintenance practices through their management of their winter maintenance contractors.

- **Behavior Change Implementation Tool #1:** The BASWG will provide annual training to MS4 winter maintenance managers on winter maintenance BMPs and ways to implement them. The BASWG may engage experts such as Maine Local Roads or Maine DEP staff in helping to deliver trainings. Specific training will be conducted on the importance of the following BMPs:
 - **Pre- and post-storm meetings and analysis**
 - **The use of pre-wetted salt**
 - **Anti-icing and pretreatment**
 - **Calibration of product spreaders**
 - **Material storage and loading**

- **Behavior Change Implementation Tool #2:** The BASWG will create a Chloride Tracking Tool (CTT) for public works and winter maintenance managers to track the amount of chlorides (brines and solid materials) used and storm event data. The tool will be developed to focus on amount of chlorides per storm. Other factors such as the precipitation type, precipitation amount, temperature, and BMPS used will be included in this tool. These factors will help managers compare the amount of deicing materials between storms, which will allow them to gauge the effectiveness of the BMPs in their chloride reduction efforts.

- **Behavior Change Implementation Tool #3:** Facilitate sharing of successes and failures between the different MS4 managers to aide in BMP selection. The BASWG will host MS4 winter maintenance managers at a meeting of the BASWG annually to discuss their progress working towards the plan's winter maintenance goals and share technical challenges and opportunities. Peer-to-peer sharing is a primary learning tool for public works staff. The focus of this meeting is to learn from others and compare approaches. MS4s commit to incorporating lessons learned and brainstorm any additional improvements. In the fifth year of the plan, BASWG will host a roundtable discussion of

these managers to present regional comparisons and discuss future strategies for winter road maintenance chloride BMPs.

- **Measurable Goals**

By the end of PY5,

- 100% of MS4 winter maintenance managers will receive annual training on the following best management practices:
 - Proper material handling practices to reduce waste and limit chloride content site runoff
 - Proper chloride use of chemicals used for deicing measures, including storage, handling, and application
- The BASWG will make a Chloride Tracking Tool available to all members to track the amount of deicing product used each storm which will also include storm data. The CTT may have features/data that do not apply to all MS4s.
- At least 80% of BASWG MS4s will utilize the BASWG’s Chloride Tracking Tool, or otherwise track:
 - Usage of deicing products and number of storm events.
 - The amount of salt and brines used per event, the number and dates of storm events, which may include storm characteristics such as precipitation type, accumulation totals, duration, and temperature.
- As a result of using the CTT tool, at least 80% of MS4s will use their own CTT data to modify their management strategies to reduce salt usage.
- At least 65% of BASWG MS4s will report adoption of new BMPs, or an increase in adoption of existing BMPs. These BMPs will include, but are not limited to:
 - Holding pre-and post-storm team meetings
 - Calibrated spreading of deicing materials
 - Using additional chemicals to augment the effectiveness of salt/sand spread on treatment areas
 - Pre-wetting dry deicers
- The BASWG will host a focused chloride plan discussion among BASWG MS4 winter maintenance managers at a meeting of the BASWG annually and a PY5 roundtable to evaluate progress and next steps.
- By the end of PY5, all MS4s have reviewed and, if needed, revised their winter maintenance level of service plan.

Evaluation

Annual MS4 Winter Maintenance Manager Survey	The BASWG will collect data on use of winter maintenance BMPs annually from MS4 winter maintenance managers in MS4s. The results will be shared at annual roundtable meetings. PY1 and PY5 data will be used to
--	---

	document the impact of this behavior change campaign (aka 80% are using chloride tracking tool, 65% adopted at least the 4 specified BMPs).
Training Evaluations	The BASWG will conduct pre-and post-training evaluations to determine the impact of training activities.
PY 2-4 Annual focused chloride plan discussion at BASWG Meeting	Documentation of MS4 participation and summary notes of meeting discussion and decisions; identification of practices that can be shared to increase efficient use of products and reduce chloride use.
Reviewed Winter Maintenance Service Plans	Each BASWG MS4 will share any changes that have been made to their service level plans as a result of their analysis during the roundtable
PY5 Roundtable Participation and Outcomes	Documentation of MS4 participation and summary notes of roundtable discussion and decisions. Identification of key next steps for strengthening the use of or adopting new winter snow and ice control BMPs in the region.

Implementation Schedule

The BASWG will deliver this campaign according to the following implementation schedule:

PY1:

- BASWG conducts baseline evaluation for behavior change campaign target audience 1.
- BASWG delivers annual training to MS4 winter maintenance managers (prior to the winter maintenance season if possible)
- BASWG develops Chloride Tracking Tool and guidance on how to use these tools
- BASWG hosts annual MS4 Winter Maintenance Manager Discussion (following the winter maintenance season if possible)
-

PY2:

- BASWG delivers annual training to MS4 winter maintenance managers
- MS4s use Chloride Tracking Tool and BASWG provides technical assistance
- BASWG hosts annual MS4 Winter Maintenance Manager Discussion

PY3:

- BASWG delivers annual training to MS4 winter maintenance managers

- MS4s use Chloride Tracking Tool and BASWG provides technical assistance
- BASWG hosts annual MS4 Winter Maintenance Manager Discussion

PY4:

- BASWG delivers annual training to MS4 winter maintenance managers
- MS4s use Chloride Tracking Tool and BASWG provides technical assistance
- BASWG hosts annual MS4 Winter Maintenance Manager Discussion
- MS4s review their winter maintenance service level plans in light of received BMP trainings and MS4 analysis of chloride use. BASWG continues to provide support to MS4s as needed in this process.

PY5:

- BASWG delivers annual training to MS4 winter maintenance managers
- MS4s use Chloride Tracking Tool and BASWG provides technical assistance
- BASWG hosts annual MS4 Winter Maintenance Manager Discussion
- MS4s incorporate changes into their winter service level plans to address any identified areas for improvement. BASWG continues to provide support to MS4s as needed in this process.
- BASWG conducts evaluation of overall effectiveness of the behavior change campaign for Target Audience 1.

Responsible Party

- 1) BASWG Executive Committee

Behavior Change Campaign Target Audience 2: Homeowners

The BASWG seeks to encourage homeowners to adopt stormwater-friendly chloride application planning and application practices to reduce the amount of chlorides entering local waters.

Target Audience: The BASWG’s second behavior change target audience is homeowners between the ages of 25 and 55 who manage their own snow and ice removal within the Greater Bangor Urbanized Area.

Background

Chlorides are a major component of winter road maintenance for snow and ice removal. Chloride pollution likely contributes to the detriment of water quality in stormwater. This campaign will build on efforts over the last permit cycle to make MS4 winter maintenance decision-makers aware of the negative impacts of chlorides on local waters and actions that can be taken to reduce chloride impacts. Chloride reductions must be balanced with Public Safety concerns as the public has come to expect clear roads shortly after winter storm events.

This campaign will build on initial efforts over the two years to make target audience homeowners aware that their winter maintenance activities can impact stormwater, lead to pollution, its impacts, and that there are specific actions they can take to reduce these impacts. BASWG led a regional ad campaign via electronic media to share messaging on this issue in 2019-2021.

Behavior Change Messages:

Initial feedback from homeowners in the BUA in March 2021 indicates that safety for the residents of the home is the primary reason homeowners apply chloride products. Additional reasons often include the safety of visitors and delivery persons, especially mail and oil deliveries, and concerns about liability. Other reasons are reported to play less of a role, such as influence of neighbor behaviors, because they have always done it that way, and concerns about aesthetics.

Based on the findings in the Maine Local Roads Winter Snow and Ice Control Best Management Practices Handbook, the Margaret Chase Smith Center Salt Project Research Report, and survey data from BASWG landing page surveys, the BASWG will use the following behavior change messages:

- Keep your walkways safe this winter with smart salt usage.
 - Always shovel before applying salt
 - Only apply salt when temperatures are above 15 degrees Fahrenheit and before any ice can form.
 - Read and follow the application instructions on the product packaging for best results.

Behavior Change Message Delivery/Implementation Tools

Due to the seasonal nature of this behavior change campaign, these messages may only be delivered during the colder months of the year when ice and snow are present.

- **Outreach Tool #1:** Winter maintenance-focused online digital marketing campaigns that use purchased ads on search engines (e.g. Google ads), and social media (e.g. “boosted” posts) to drive targeted users to electronic landing pages with additional information on best practices for winter maintenance. These ads seek to provide outreach to both existing BASWG social media followers and non-followers in the Bangor UA.
- **Outreach Tool #2:** The use of social media (e.g. BASWG’s Facebook, Twitter and Instagram accounts) to communicate winter maintenance behavior change messages as a regular outreach tool, including delivery of targeted messaging through ongoing use of strategically-timed, seasonally-focused snow and ice control content. These posts are designed to provide outreach to both current followers and, through paid “boosts” to attract new viewers and followers as specified in Outreach Tool #1.

- **Outreach Tool #3:** Distribution and display of winter snow and ice control behavior change messaging on printed materials in public areas, including posters and flyers at MS4 offices that serve the public and at an event (such as the Maine Science Festival) once in-person events resume as COVID-19 pandemic restrictions end and the public can safely gather again. In the meantime, the BASWG will place materials in open MS4 public-serving offices that are open and people can view these printed materials safely.

Measurable Objectives

The BASWG secured guidance on what an achievable impact would be from the proposed behavior change efforts. Pulse Marketing from Bangor has advised the BASWG to set impact goals at 10% increase of the target audience adopting each targeted behavior between the PY1 baseline and PY5.

Between a PY1 baseline and PY5, 10% increase of homeowners 25-55 years of age in the BUA report:

- 10% increase in respondents that shovel snow before applying salt.
- 10% increase in respondents that read the product packaging before applying product
- 10% increase in respondents that follow the directions on the product package when applying it on their property
- 10% increase in respondents that apply salt only when temperatures are above 15 degrees Fahrenheit.

Evaluation

The BASWG will evaluate the impact of the behavior change campaign for homeowners and renters through four evaluation methods:

- 1) The BASWG's PY1 baseline and PY5 impact survey;
- 2) Analytics from the online behavior change ad campaign;
- 3) Social media analytics; and
- 4) BASWG.org website analytics. The BASWG may also utilize a landing page survey during specific years to gauge progress.

1. BASWG Online Surveys

The BASWG will conduct an online awareness and behavior change survey in PY1 and PY5, including specific targeted questions around winter maintenance behaviors of target audience homeowners. The BASWG will collect the following data from the target audience:

- Whether respondents read and followed the application instructions on the product packaging before applying product
- Whether respondents shovel snow before applying product

- Whether respondents apply salt only when temperatures are above 15 degrees Fahrenheit.
- Whether respondents apply salt before ice can form.

2. BASWG Targeted Online Behavior Change Ad Campaign on Winter Maintenance

The BASWG will document and analyze:

- The number and content of the individual seasonal winter maintenance display campaigns that are delivered;
- The number of individuals that view each of the BASWG’s display campaign online ads;
- The number and percentage of individuals that click through to the BASWG targeted messages to the campaign’s landing page;
- The amount of time individuals spend viewing campaign content via the winter maintenance landing page;
- The number and percentage of individuals that interact with the campaign’s landing page content.

3. BASWG Social Media Posts on Chloride Reduction and Winter Maintenance Practices

The BASWG will document and analyze the following social media analytics:

- Descriptive information about targeted social media outreach content
- Number of Visitors to each social media platform (e.g., Facebook, Twitter, Instagram)
- Number of followers for each social media platform
- Number of click-throughs for any targeted social media posts designed to take the user to another landing page or site
- Information on which social media posts garnered the greatest number of views, engagements, and shares.

4. Interactions with BASWG.org Website Winter Practices Webpage

The BASWG will document and analyze the following website analytics:

- Descriptive information about winter maintenance behavior change website content
- Number website users who visited the winter maintenance landing page; and
- Number of return users.

Implementation Schedule

PY1:

- Conduct baseline evaluation for behavior change campaign target audience
- Deliver winter maintenance behavior change online display ad campaign
- Deliver targeted messaging via BASWG’s social media and website
- Develop and display posters on stormwater-friendly winter maintenance behaviors for target audience in MS4 public areas

PY2:

- Deliver winter maintenance behavior change online display ad campaign
- Deliver targeted messaging via BASWG’s social media and website
- Display posters on stormwater-friendly winter maintenance behaviors in MS4 public areas

PY3:

- Deliver winter maintenance behavior change online display ad campaign
- Deliver targeted messaging via BASWG’s social media and website
- Display posters on stormwater-friendly winter maintenance behaviors in MS4 public areas

PY4:

- Deliver winter maintenance behavior change online display ad campaign
- Deliver targeted messaging via BASWG’s social media and website
- Display posters on stormwater-friendly winter maintenance behaviors in MS4 public areas

PY5:

- Deliver winter maintenance behavior change online display ad campaign
- Deliver targeted messaging via BASWG’s social media and website
- Display posters on stormwater-friendly winter maintenance behaviors in MS4 public areas
- Conduct evaluation of overall effectiveness of winter maintenance behavior change campaign

Responsible Party

- 1) BASWG Executive Committee

3.2 MCM 2 – Public Involvement and Participation**Public Notice**

To meet the requirements in MCM2a, the BASWG will comply with applicable state and local public notice requirements using effective mechanisms for reaching the public. The BASWG will comply with the requirements of the Maine Freedom of Access Act (1 M.R.S. §401 et seq (“FOAA”) when involving stakeholders in the implementation of the GP. The BASWG will document meetings and attendance in the BASWG’s SWMP annual report to measure this goal.

Measurable Goals

BMP 2.a.1	The BASWG will meet applicable state and local public notice requirements.
BMP 2.a.2	The BASWG will meet FOAA requirements.
BMP 2.a.3	The BASWG will document meetings and attendance in the BASWG’s annual report.

Public Event(s)

To meet the requirements in MCM2b, the BASWG will annually host/conduct/participate in one public event, with participation focusing on a pollution prevention and/or water quality theme. This/these events will be targeted at either the general public in the seven regulated communities or a segment of this population the BASWG wishes to reach.

Measurable Goal

BMP 2.b.1	The BASWG will host/conduct/participate in one public event focusing on a pollution prevention and/or water quality theme
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When public safety requirements can be met (i.e., COVID-19 pandemic safety concerns can be met), the BASWG will participate in the Maine Science Festival. If this event is not available, BASWG will select a comparable public event or conduct street and stream clean-ups or stormdrain marking events.

At times when in-person interaction is not possible due to public safety concerns (e.g., COVID-19 safety hazards), the BASWG will instead conduct public outreach via social media and an online ad campaign content (e.g. BASWG’s ad campaign to limit the improper disposal of personal protective equipment, such as masks, gloves and sanitizer bottles during the pandemic, which was approved as an acceptable replacement for BASWG’s planned activities by DEP in 2020-2021).

Individual MS4s are Solely Responsible for Compliance Activities for MCMs 3-6

The BASWG plan does not address any specific requirements or activities in this plan related to compliance with Minimum Control Measures 3-6, which are:

- MCM 3: Illicit Discharge Detection and Elimination Program;
- MCM 4: Construction Site Stormwater Runoff Control;
- MCM 5: Post-Construction Stormwater Management in New Development and Redevelopment; and
- MCM 6: Pollution Prevention/Good Housekeeping for Municipal Operations.

Individual MS4s are responsible for compliance with these requirements. The BASWG may provide meeting time or other supports around these MCMs but is not required to do so in this plan.

4.0 General Requirements

The following section addresses BASWG's plans to comply with the compliance record and annual reporting required in the MS4 GP.

4.1 Compliance Records

In compliance with the requirements of the permit, the BASWG will keep all records required by this GP for at least three (3) years following its expiration or longer if requested by the Department or the U.S. Environmental Protection Agency (EPA). The BASWG will also make records, including its SWMP, available to the public during regular business hours.

4.2 Annual Reporting

In compliance with the requirements of the permit, the BASWG will submit electronically an Annual Compliance Report to the Department for review by September 15 of each year, using any Standardized Annual Compliance Report forms provided by the Department or provide an alternative form to the Department for review and approval.

The BASWG's Annual Compliance Report will include the following:

- The status of compliance with the terms and conditions of this GP and permittee specific DEP Order permit modification based on the implementation of the permittee's SWMP for each permit year, an assessment of the effectiveness of the components of its stormwater management program, an assessment of the appropriateness of identified BMPs, progress towards achieving identified measurable goals for each of the MCMs and progress toward achieving the goal of reducing the discharge of pollutants to the MEP.
- A summary of information collected and analyzed, including monitoring data, if any, during the reporting period.
- A summary of the stormwater activities the permittee intends to undertake pursuant to its SWMP to comply with the terms and conditions of this GP and permittee specific DEP Order permit modification during the next reporting cycle.
- A change in any identified BMPs or measurable goals that apply to the SWMP.
- A description of the activities, progress, and accomplishments for each of the MCMs #1 and #2, including such items as the status of education and outreach efforts and public involvement activities. Where applicable, the MS4 will quantify steps/measures/activities taken to comply with this GP and its SWMP including reporting on the types of trainings presented, the number of municipal and contract staff that received training, the length of the training and training content delivered as well as any changes in municipal operations.

Changes to the report based on the Department's review comment(s) must be submitted to the Department within 60 calendar days of the receipt of the comment(s).

5.0 Appendices

Appendix A: MS4 General Permit



APPENDIX E

NON-STORMWATER DISCHARGE POLICY



NON-STORMWATER DISCHARGE POLICY

Purpose.

The purpose of this non-stormwater discharge policy is to prohibit non-stormwater discharges to the University of Maine at Augusta – Bangor Campus (UMAB) storm drainage system as required by federal and state law.

Applicability.

This policy shall apply to all discharges of into the facility storm drainage system.

Prohibition of non-stormwater discharges.

Except as allowed or exempted herein, no person shall create, initiate, originate, or maintain a non-stormwater (illicit) discharge to the storm drainage system. Such non-stormwater discharges are prohibited.

Allowed non-stormwater discharges.

The creation, initiation, origination, or maintenance of the following non-stormwater discharges to the storm drainage system are allowed:

- 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; and swimming pool water provided that the chlorine level is less than one mg/l and a plan has been submitted to the DEP by the pool owner indicating the discharge procedure and amount, duration, and location of the discharge;
- Discharges specified in writing by the facility as being necessary to protect public health and safety; and
- Dye testing, with verbal notification to the facility prior to the time of the test.

Investigations, Monitoring, Elimination.

The facility will maintain an Illicit Discharge Detection Plan. This plan will establish processes by which UMAB will identify, investigate, and eliminate any illicit discharges to the storm drainage system.

City of Bangor Jurisdiction.

UMAB is located within the City of Bangor. Therefore, enforcement of non-stormwater discharges will be by the City of Bangor in accordance with its non-stormwater discharge ordinance.



APPENDIX F

ILLICIT DISCHARGE DETECTION AND ELIMINATION PLAN



HALEY WARD

ENGINEERING | ENVIRONMENTAL | SURVEYING

ILLICIT DISCHARGE DETECTION AND ELIMINATION PLAN

FOR

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FEBRUARY 2022

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- Attachment B Quality Assurance Project Plan



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AUTHORITY

The Director of Facilities Management will implement at the Bangor Campus the policies and procedures established by this written Illicit Discharge Detection and Elimination (IDDE) Plan.



DEFINITIONS

Allowable Non-Stormwater Discharge: Non-stormwater discharges are authorized by the Permit, provided they do not contribute to a violation of water quality standards as determined by the Maine Department of Environmental Protection (MDEP). Allowable non-stormwater discharges include: landscape irrigation, diverted stream flows, rising groundwater, uncontaminated groundwater infiltration (as defined at 40 CFR 35.2005(20)), uncontaminated pumped groundwater, 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, firefighting activity runoff, water line flushing, discharges from potable water sources, individual residential car washing, and dechlorinated swimming pool discharges. (MDEP, 2020).

Generating Site: The source area, or operation, where a stormwater, non-stormwater (illicit), or allowable non-stormwater discharge is produced or originated. (Pitt, 2004).

Grab Sample: A single sample or collection of stormwater taken during a qualifying storm event from a single location. The sample may be collected manually or with an automatic sampler.

Illicit Connection: Any drain or conveyance, whether on the surface or subsurface that allows an illegal discharge to enter the storm drain system including but not limited to conveyances that allow non-stormwater discharge including sewage, process wastewater, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains and sinks, regardless of whether the drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency; or any drain or conveyance connected from a commercial or industrial land use to the storm drain system that has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency. (Pitt, 2004).

Illicit Discharge: Any discharge to a regulated Municipal Separate Storm Sewer (MS4) system that is not composed entirely of stormwater other than: discharges authorized pursuant to another permit issued pursuant to 38 M.R.S. Section 413; uncontaminated groundwater; water from a natural resource (such as a wetland); or other Allowable Non-Stormwater Discharge identified in Part IV(C)(3)(h) of the Permit and summarized above. (MDEP, 2020).



Municipal Separate Storm Sewer System (MS4): A conveyance or system of conveyances designed or used for collecting or conveying stormwater (other than a publicly owned treatment works (POTW), as defined at 40 CFR 122.2, or a combined sewer), including, but not limited to, roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels or storm drains owned or operated by any municipality, sewer or sewage district, Maine Department of Transportation (MDOT), Maine Turnpike Authority (MTA), State agency or Federal agency or other public entity that discharges to waters of the State other than groundwater. (MDEP, 2020).

Non-Stormwater Discharge: Any discharge to an MS4 that is not composed entirely of stormwater. See also Illicit Discharge.

Permit: MDEP *General Permit for the Discharge of Stormwater from Small State and Federally Owned Municipal Separate Storm Sewer Systems*, effective October 1, 2022.

Stormwater: The part of precipitation including runoff from rain or melting ice and snow that flows across the surface as sheet flow, shallow concentrated flow, or in drainage ways. (MDEP, 2020).



ILLICIT DISCHARGE DETECTION AND ELIMINATION PLAN

SECTION 1.0 | INTRODUCTION

1.1 Overview of Regulatory Program

The *General Permit for Discharge of Stormwater from Small State and Federally Owned Municipal Separate Storm Sewer Systems (MS4; General Permit)* is issued by the Maine Department of Environmental Protection (MDEP).¹ Compliance with the General Permit, and applicable provisions of Maine waste discharge and water classification statutes and rules, authorizes the direct discharge of stormwater from or associated with a small State and/or Federally owned municipal separate storm sewer system (MS4) to another MS4 or waters of the State other than groundwater (38 M.R.S.A. §413).²

The University of Maine at Augusta, Bangor Campus (UMAB) is a small State-owned MS4. The UMAB MS4 is located within the City of Bangor (City) MS4. Therefore, UMAB is also subject to stormwater discharge requirements established by the City.

The MS4 Permit requires UMAB to implement six Minimum Control Measures (MCMs). Each MCM is designed to protect water quality by reducing the discharge of pollutants within the UA to the maximum extent practicable (MEP; **Section 1.3**). This Illicit Discharge Detection and Elimination (IDDE) Plan satisfies the MCM 3 requirement that UMAB implement and enforce a program to detect and eliminate illicit and non-stormwater discharges.

1.2 Unauthorized Discharges

In accordance with its Stormwater Management Plan, UMAB prohibits unauthorized (illicit) discharges to its stormwater system (Haley Ward, 2022). In accordance with the City's non-stormwater discharge ordinance (*Code of Ordinances, Chapter 197, Non-stormwater Discharges*), UMAB is prohibited from making unauthorized discharges to the City's stormwater system. The City's non-stormwater discharge ordinance establishes the City's legal authority to carry out inspection, monitoring and enforcement activities at UMAB to ensure compliance therewith.

Unauthorized (illicit) discharges referenced within this document include, but may not be limited to, the following types of discharges that are not authorized by the General Permit:

- Discharges that are mixed with sources of non-stormwater (other than allowable non-stormwater sources).

¹ MEP means "available and feasible considering cost, existing technology, and logistics based on overall purpose of the project."

² The General Permit authorizes direct discharges in those parts of Maine for which the MDEP has received delegated federal authority under the National Pollutant Discharge Elimination System (NPDES) program.



- Discharges of hazardous substances, chemicals, or oil.
- Discharges that cause or contribute to a violation of water quality standards.

1.3 IDDE Compliance

The Director of Facilities Management or their designee has primary responsibility for implementing the IDDE Plan and ensuring that all reasonable steps are taken to investigate, track, and eliminate illicit discharges to the UMAB stormwater system. The types of data and records stored by UMAB to aid in any such effort include:

- Stormwater Infrastructure
- Sanitary sewer infrastructure
- Facilities
- Construction sites
- Post-construction sites
- Investigations
- Assessments
- Inspections
- Documents identified in the IDDE Quality Assurance Program Plan (QAPP; **Attachment B**)

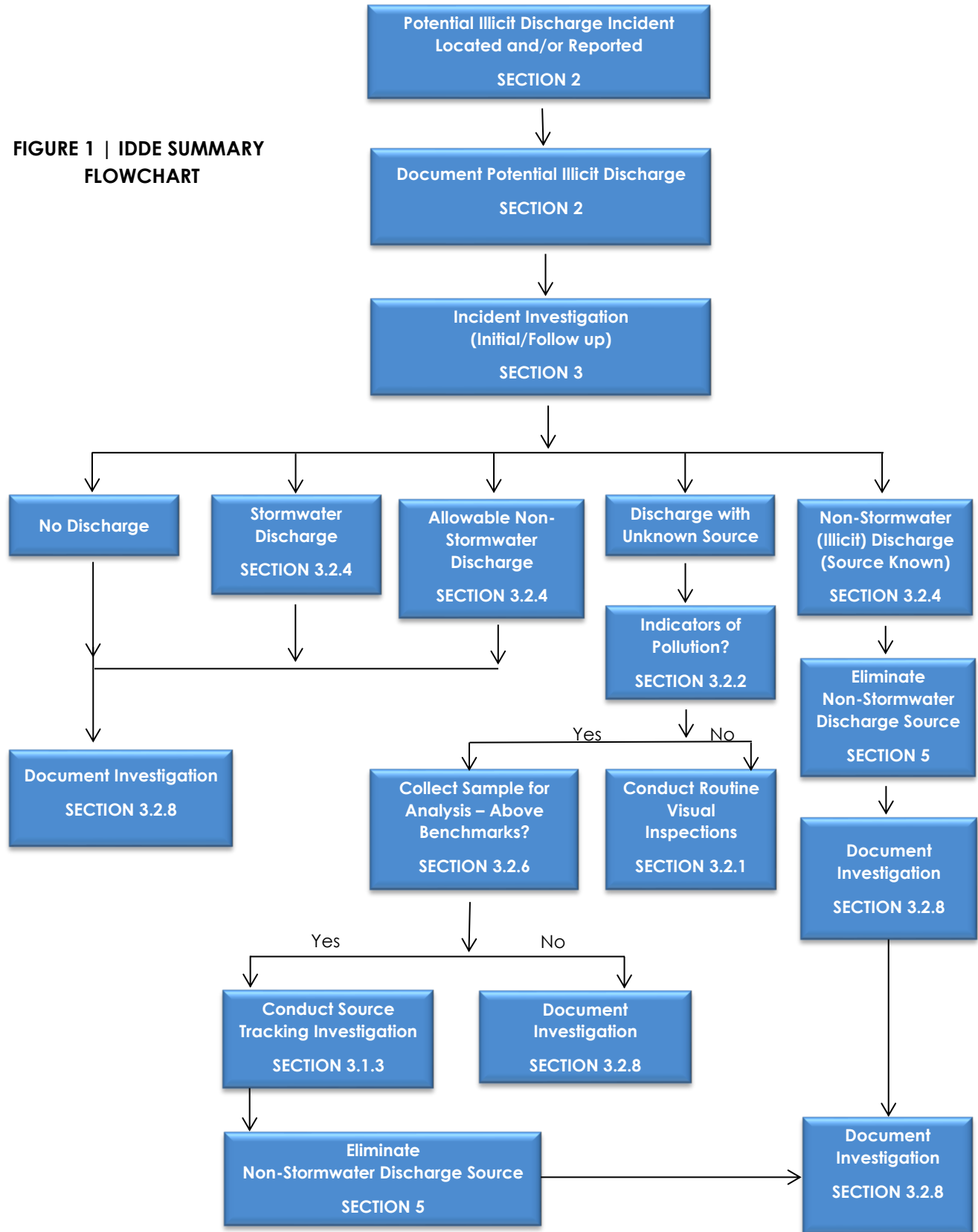
The Director of Facilities Management is supported by UMAB's Consulting Engineer.

1.4 Summary of IDDE Process

Figure 1 summarizes the steps involved in UMAB's IDDE process. Refer to **Sections 2** through **5** for a specific delineation of responsibilities regarding illicit discharge identification, reporting, investigation, cleanup, and addressment.



FIGURE 1 | IDDE SUMMARY FLOWCHART





SECTION 2.0 | ILLICIT DISCHARGE IDENTIFICATION AND REPORTING

It is important to identify and track each potential illicit discharge and complete follow up investigations as needed to determine the generating site, potential pollutants discharged, cleanup procedures required, and whether corrective actions are needed.

An illicit discharge can be identified and reported to UMAB as a result of community complaints through telephone or walk-ins to the Facilities Management office, infrastructure inspections, internal reporting, accidents/spills, infrastructure failures, and construction and post-construction projects.

2.1 Report Types

2.1.1 Community Complaint

Complaints regarding potential illicit discharges may come from students, local residents, nonresidents, campus stakeholders, or could be made by an anonymous source. Complaints can be made to the Facility either through the facilities management phone number (207-356-0280), filing a complaint at the Dean's office, or by contacting security (207-262-7777). A summary of the investigation findings should be made available to the complainant if requested. Contact information for the complainant should be collected at the time the complaint is reported. Complainants may also make anonymous complaints and should not be required to submit their name or contact information.

Telephone Reporting

All phone calls received by UMAB employees related to stormwater are forwarded to the Director of Facilities Management or designee, alerting them to the report. The Facilities Management Office or designee receives these calls during normal business hours. Concerns during off-hours can be reported to Campus Security.

Illicit Discharge Telephone Reporting:
207-262-7712 (Facilities Management Office)
207-631-3138 (Facilities Lead)
207-262-7777 (Campus Security)

Walk-in

Potential illicit discharge incidents can be reported to UMAB by walking into any of the offices located at the facility. All complainants making a walk-in report of a potential illicit discharge should be asked to speak with the Director of Facilities Management or their designee. If the complainant is unwilling or unable to wait to speak to one of these parties, the UMAB employee collecting the report from the complainant must attempt to collect as much information regarding the potential illicit discharge as possible and forward this information along to the Director of Facilities Management or their designee immediately. Facility employees should refer to **Section 2.2** for guidance on completing the Potential Illicit Discharge Incident Report (**Attachment A**).



2.1.2 Infrastructure Inspections

The infrastructure operated by UMAB is inspected on a regular basis to assess functionality and maintenance requirements. Infrastructure inspections may include the potable water system, sanitary sewer system, or the stormwater system.

Sanitary Sewer System

The sanitary sewer system is maintained by the City of Bangor. Routine inspections and flushing are conducted by the City. Copies of the sanitary sewer infrastructure maps are located at Acadia Hall.

Stormwater System

Dry weather outfall and catch basin inspections are routinely completed by UMAB (**Attachment 5**). Discharges at outfalls and flows within catch basins may be caused by:

- Dumping
- Spills
- Illicit connections
- Groundwater intrusion
- Surface water discharges
- Allowable non-stormwater discharges

Potential illicit discharge incident reports are not required for all discharges observed during dry weather outfall inspections or catch basin inspections. If dry weather flow is observed during a dry weather inspection, or other indicators of pollution are observed during the outfall or catch basin inspections, the inspector will report the potential illicit discharge to the Director of Facilities Management or their designee immediately. If dry weather flow is observed during a dry weather outfall inspection, discharge sampling will be conducted in accordance with **Section 3.2.6** and the QAPP (**Attachment B**).

All observations will be documented on the Dry Weather Outfall Inspection Form. Discharges or steady flows with no obvious indicators of pollution will be investigated by the Director of Facilities Management or designated staff based on sample results and a prioritized schedule, giving areas with active use priority over less developed areas.

Outfalls that are inaccessible due to safety concerns are not required to be inspected; however, a substitute inspection must be conducted at the first (i.e., closest) accessible inspection location within the stormwater system (e.g., catch basin, manhole, pipe, etc.) that drains to the inaccessible outfall. Accordingly, if a dry weather flow is present at the closest accessible inspection location, it must be sampled.



Potable Water System

The potable water system is maintained by Bangor Water, an independent water management district. Routine inspections are conducted by Bangor Water. Copies of the potable water infrastructure maps are located in Acadia Hall.

Hydrants

Hydrants at the Facility are maintained by Bangor Water. Routine inspections and flushing are conducted by the District and an annual report of these activities is reported to the City and the Facility.

2.1.3 Internal Reporting

Reports of potential illicit discharges from Facility employees should be made to the Director of Facilities Management or designee. This includes accidents/spills that do not involve hazardous or petroleum products. The Director of Facilities Management or their designee will complete a Potential Illicit Discharge Incident Report (**Section 2.2**) and will either investigate (**Section 3**) or complete notification to the necessary responders (**Section 2.2**).

2.1.4 Accidents/Spills

All potential illicit discharge incidents involving accidents or spills of hazardous products or petroleum products where there is the potential concern for health and safety of the public must be reported to the municipal fire department.

2.1.5 Infrastructure Failure

Stormwater conveyance systems are often co-located with other infrastructure below grade or within close proximity of other facility infrastructure systems. If a failure of any of these systems occurs, discharges of pollutants to the stormwater conveyance system are possible. Infrastructure failures should be reported to the Director of Facilities Management or their designee immediately upon identification. The Director of Facilities Management or designee will complete a Potential Illicit Discharge Incident Report (**Section 2.2**) and will either investigate (**Section 3**) or complete notification to the necessary responders (**Section 2.2**).

These infrastructure systems could include:

- Sanitary Sewer
- Stormwater
- Potable water
- Hydrants

2.1.6 Construction/Post-construction Projects

Construction projects at UMAB have the potential to discharge pollutants to the stormwater conveyance system during construction as well as post-construction. The Director of Facilities Management or designee conducts periodic inspections of



construction projects that disturb one acre of land or more. If illicit discharges are observed during these inspections, the Director of Facilities Management or designee will address the contractors on the site immediately and complete a Potential Illicit Discharge Incident Report (**Section 2.2**).

Projects subject to the City of Bangor Stormwater Ordinance (*Code of Ordinances, Chapter 268, Stormwater*) will be inspected by the owner annually and the findings will be reported to the City.

2.1.7 Interconnections between MS4s

Regulated MS4s do not discharge into the UMAB MS4. If this changes in the future, UMAB will notify any such entities of how to report an illicit discharge to the UMAB MS4. The UMAB MS4 discharges into the City's MS4.

2.2 Steps of Reporting

2.2.1 Incident Tracking Number

Incident tracking numbers must be issued for each potential illicit discharge reported to UMAB. The tracking number allows UMAB to document all written communication on the incident from reporting, investigating, cleanup, and enforcement. The incident tracking number should include the four-digit year followed by the two-digit month followed by a dash and the incident number reported for that month (e.g., 201412-01, 201412-02, 201501-01).

2.2.2 Incident Tracking Database

At the time that an incident tracking number is issued, the potential illicit discharge should be entered into the Incident Tracking Database. The database should identify each potential incident by tracking number, date of incident, type of report, and status of the potential incident investigation. The database should be updated as the progress of the investigation changes.

2.2.3 Potential Illicit Discharge Incident Report

If a potential illicit discharge is reported, UMAB will document the potential illicit discharge on forms similar to those in **Attachment A**. The following types of incident reporting details will be collected by UMAB at the time a potential illicit discharge incident is reported:

- Report type
- Report date
- Report time
- Report taken by
- Precipitation in past 48 hours
- Incident date
- Incident time
- Complainant name
- Complainant phone



- Complainant contact information
- Whether an illicit discharge occurred

Report type is the manner in which UMAB was notified of the potential illicit discharge. The type of report should be listed as one of the following:

- Citizen complaint
- Infrastructure inspection
- Internal reporting
- Accident/spill
- Infrastructure failure
- Construction/post-construction
- Interconnection with MS4
- Interconnection with MDOT

Report date is the date that a UMAB employee is made aware of the potential illicit discharge.

Report time is the time on the Report Date that a UMAB employee is made aware of the potential illicit discharge.

Report taken by is the UMAB employee who was made aware of the potential illicit discharge and is completing the Potential Illicit Discharge Report.

Precipitation (in) in past 48 hours is the total precipitation, measured in inches, within the last 48 hours prior to the incident being reported to UMAB.

Incident date is the date or dates that the potential illicit discharge incident occurred. The Incident Date and the Report Date may not always be the same. For example, a complaint may be reported on Monday stating that they observed someone dumping waste oil into a catch basin on the previous Friday.

Incident time is the time on the Incident Date that the potential illicit discharge incident occurred.

Complainant name is the name of the individual making the report to UMAB. The Complainant may be a student, facility employee, or may wish to remain anonymous.

Complainant phone is the contact phone number for the complainant. The contact phone for the complainant is needed in case they request additional information on the findings of the incident investigation, or if additional details are needed by UMAB in order to investigate, cleanup, or enforce the potential illicit discharge incident.



Complainant contact information is the best form of contact for the complainant and may be a street address, mailing address, or email address. The contact information for the complainant is needed in case they request additional information on the findings of the incident investigation, or if additional details are needed by UMAB in order to investigate, cleanup, or enforce the potential illicit discharge incident.

Whether an Illicit Discharge Occurred is the determination of the Director of Facilities Management or their designee. A "No" closes the case while a "Yes or Unknown" triggers a follow up investigation.

2.2.4 Response

Once the incident is documented, the person completing the incident report will notify the proper responder based on the severity and type of report. The following details may be noted.

- Responder Notified
- Responder Contact Information
- Notification Date
- Notification Time

Immediate Response

Immediate responses are required for any potential discharges that pose an immediate risk to health and safety.

Delayed Response

Delayed responses may occur when there is delayed reporting or when there is not an immediate risk to human health or the environment.

2.2.5 Notification

Emergency

Notification to local emergency responders must be made for all potential discharges that pose an immediate risk to health and safety. Depending on the source, type of discharge, and cleanup requirements the appropriate regulatory agency may also need to be notified of the discharge.

Emergency Response: 911

For any emergency, notification must be made to the proper emergency responders and if there is potential for illicit discharges into another MS4s system, notification should be made to 911 and the interconnected MS4:

City of Bangor: Engineering Department, 207-992-4243

**Non-Emergency**

Non-emergency situations include those that do not have the potential to have a detrimental effect on human health and the environment.

For any non-emergency, notification of potential illicit discharges into another MS4 system should be made to the interconnected MS4:

City of Bangor: Engineering Department, 207-992-4243
stormwater@bangormaine.gov



SECTION 3 | INVESTIGATION

3.1 Types of Investigations

3.1.1 Initial Investigation

An initial investigation is the first time that UMAB personnel visit a potential discharge location to gather information and potentially aid in spill response procedures. At the time of the initial investigation, the details of the investigation and the necessity of follow up action are identified. Refer to **Section 3.2.8**.

Initial investigations may result in the determination that no discharge to the stormwater system occurred as a result of the incident reported. If it is determined that a discharge to the stormwater system has occurred or is continuing to occur as a result of the incident reported, then a full investigation must be completed to identify and stop the source of the discharge.

3.1.2 Follow up Investigations

Follow up investigations may be needed to gather additional information, make visual observations, collect samples, assess damage to infrastructure, or to track sources of illicit discharges. At the time of the follow up investigation, the details of the investigation and whether additional steps are required will be documented. Refer to **Section 3.2.8**.

3.1.3 Source Tracking Investigations

Source tracking investigations are a type of follow up investigation used to determine the source of a discharge. Sampling and analysis should be used as necessary to aid in determining the type of the discharge. Refer to **Section 3.2.6** for additional information on sampling procedures.

When the source of the discharge is anticipated to be wastewater, UMAB will coordinate with the City of Bangor, as necessary, to conduct a source tracking investigation. The facility will utilize standard practices, including video line inspections, to track the source of the discharge.

When the source of the discharge is anticipated to be drinking water, the facility will coordinate with Bangor Water conduct a source tracking investigation. Bangor Water will follow their standard practices to track the source of the discharge.

When the source of the discharge is unknown, visual observations of the drainage area and stormwater system draining to the outfall will be conducted to identify any natural sources or illicit connections contributing to the discharge. If visual observations of the system are not sufficient to determine the source, UMAB will conduct a video line inspection of the stormwater system that drains to the discharge outfall. Once a source is determined it may be necessary to conduct dye testing to confirm the source of the discharge.



All investigations can be informed by existing data from the UMAB's dry weather outfall inspections.

3.2 Steps of Investigating

3.2.1 Visual Observations

The responder from UMAB must document their visual observations at the time of the investigation (**Section 3.2.8**). The responder should include as much information as necessary at the time of the initial investigation. Observations should include whether a discharge to the stormwater system has occurred or if there was no discharge to the stormwater system based on the report made to UMAB. If a discharge has occurred and is observed at the time of the investigation, the responder must gather additional information from the discharge location.

3.2.2 Indicators of Pollution

Indicators of pollution must be reported during the initial and any follow up investigations. Indicators of pollution will aid UMAB in determining whether additional investigations or sampling of discharges are necessary. Responders should identify any odors near the point of the discharge, as well as any color, turbidity, floatable materials, sheen, or foam in the discharge. If the responder is uncertain of how to proceed based on the indicators observed, the responder should contact UMAB's stormwater consultant.

3.2.3 Generating Site and Source of Discharge

If it is determined that a discharge to the stormwater system occurred, the source of the discharge will be determined, as feasible. Understanding the generating sites in the watershed will aid in prioritizing investigations to those land uses that have the highest risk of stormwater pollution. The generating site is the source area or operation where a stormwater, non-stormwater (illicit), or allowable non-stormwater discharge is produced or originated. Generating sites are defined by the land use or activity at the source of the discharge and may include residential, commercial, industrial, institutional, agricultural, municipal, construction, or unknown. Defining the generating site may be helpful in determining the type of discharge and ultimately eliminating the discharge from the stormwater system.

3.2.4 Types of Discharge

The culmination of a potential illicit discharge investigation is the determination as to the type of discharge or whether a discharge to the system even occurred. The types of discharge could be stormwater, allowable non-stormwater, or non-stormwater (illicit). This determination may not be able to be made at the time of the initial investigation and follow up investigations or sampling may be required before the type of discharge can be determined. It may also be determined after the completion of the investigations that a discharge to the stormwater system did not occur.

- Stormwater discharges include rainwater or ice and snow melt that run off the land and do not infiltrate into the ground.



- Allowable non-stormwater discharges are non-stormwater discharges authorized by the Permit provided they do not contribute to a violation of water quality standards as determined by the Department. Refer to “Definitions” for the definition of a non-stormwater discharge.
- Non-stormwater or illicit discharges include any direct or indirect non-stormwater discharge to the storm drain system, except for the allowable non-stormwater discharges, as defined.

If the discharge is determined to be stormwater or an allowable non-stormwater discharge, it should be noted (**Section 3.2.8**) and no further actions by UMAB are required. If the type of discharge is determined to be a non-stormwater (illicit) discharge, then the source of the discharge needs to be identified and eliminated.

3.2.5 Photo Documentation

Photos of the discharge area and the upland areas draining to the stormwater system may be helpful in determining the source and type of discharge. All photos should include a timestamp with the appropriate stormwater structure name/number identified.

3.2.6 Sampling and Analysis

Sampling and analysis of a discharge from the stormwater system may be required to determine the source and type of discharge.

- UMAB will use its discretion to determine when complaints should be sampled based on the type, nature, and location of the complaint.
- Sampling and analysis are required where dry weather flow is present for E.coli, enterococci, total fecal coliform, or human bacteroids; ammonia, total residual chlorine, temperature, and conductivity; and optical enhancers or surfactants (MDEP, 2020). Generally, non-bacterial analyses can be performed with field test kits or field instrumentation and bacterial analyses must be performed in a laboratory.

Sampling must be completed in a consistent and thorough manner to ensure data quality. The most likely types of samples to be collected will be grab samples from an outfall location or from within the stormwater system (catch basins or pipes).

Refer to **Attachment B** for a QAPP that establishes written sampling and quality assurance/quality control procedures to ensure that sample results collected by the facility during dry weather inspections can be used to confidently determine the nature of any such flows. All sampling results should be compared to the sampling parameter action levels in **Table 1** and process in **Figure 2** to aid in determining whether the discharge may be illicit and the potential source of the discharge.



TABLE 1 | SAMPLING PARAMETER ACTION LEVELS*

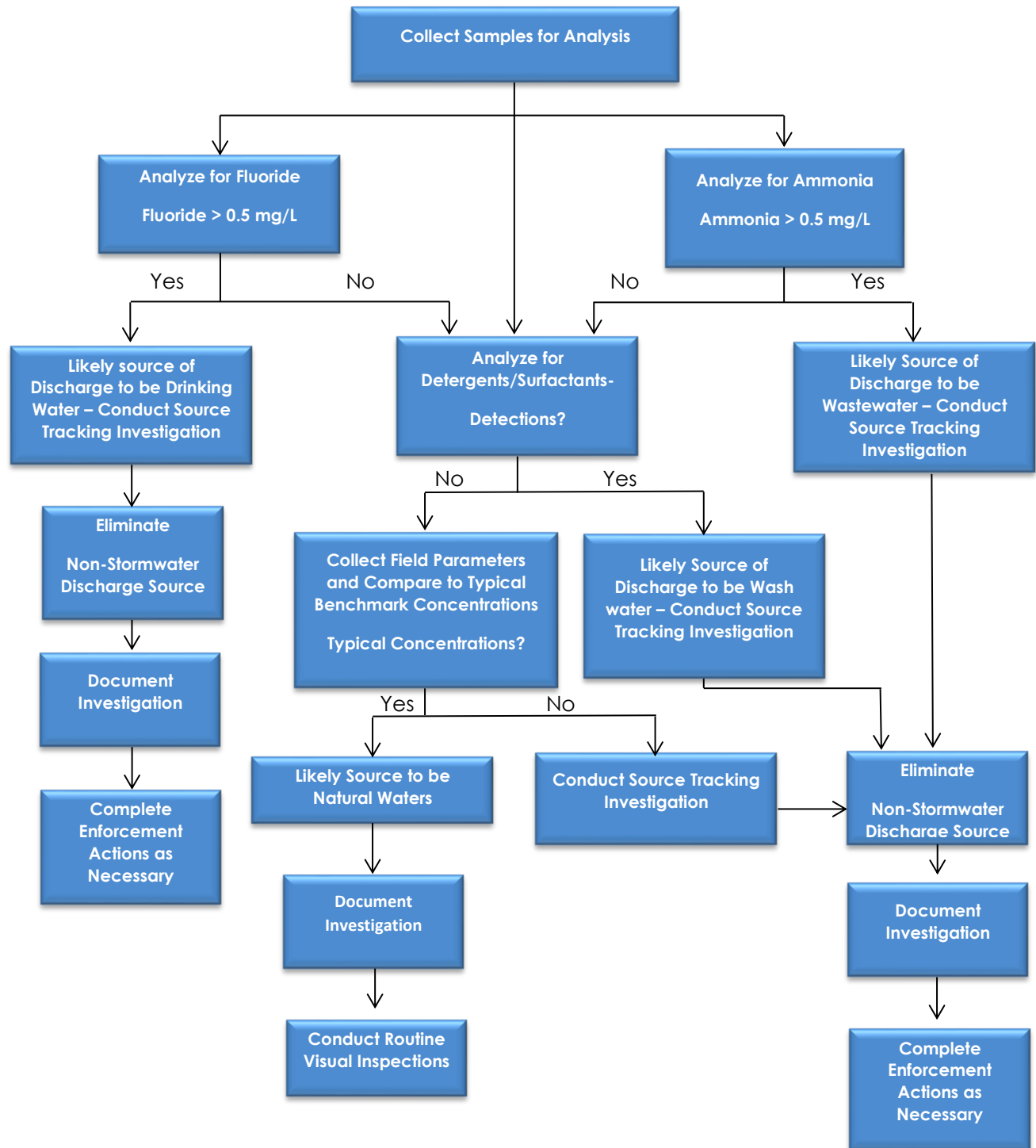
PARAMETER**	BENCHMARK CONCENTRATION	COMMENTS
Ammonia	≥ 0.5 mg/L	Likely source to be wastewater
Chlorine	≥ 0.05 mg/L	Typical drinking water is 1.0 – 1.3 ppm
Conductivity	≥ 2,000 µS/cm	Potential industrial source or dumping activity
Fluoride	>0.5 mg/L	Likely source to be drinking water. Typical drinking water is 0.7 ppm.
pH	6 - 9 s.u.	Likely source to be industrial if outside of this typical range of values.
Surfactants/Detergents	≥ 0.25 mg/L	Likely source to be wash water
Optical Brighteners	Any Detected Values	Likely source to be wash water
Turbidity	>1,000 NTU	Likely source to be a significant sediment discharge.
E. coli	≥ 236 cfu/100 mL	Likely source to be wastewater
Enterococcus	≥ 61 cfu/100 mL	Likely source to be wastewater
Fecal Coliform	≥ 54 cfu/100 mL	Likely source to be wastewater
Human Bacteroides	Any Detected Values	Likely source to be wastewater

*Information provided in Table 1 is informed by EPA 2012, Pitt 2004, and State surface water classification requirements.

** Dry weather flow is required to be sampled for some of the parameters identified in this table. These parameters are listed in **Attachment B**. Other parameters listed in the table are not required to be sampled for; however, may be sampled for as part of an investigation.



FIGURE 2 | SAMPLING AND ANALYSIS FLOWCHART





3.2.7 Notification to Proper Facility Official

If the type of discharge is found to be a non-stormwater (illicit) discharge from a residential, industrial, agricultural, construction, commercial, or institutional source, notification must be made to the Director of Facilities Management or their designee.

If the type of discharge is found to be a non-stormwater (illicit) discharge from a facility source, the Director of Facilities Management or their designee is responsible for directing cleanup and/or repairs.

3.2.8 Illicit Discharge Incident Investigation Report(s)

Refer to **Attachment A** for a sample investigation report that identifies key information that will be collected during an investigation and documented by the facility. When an investigation is completed, the following details should also be documented:

- Type of investigation
- Investigation date
- Investigation time
- Responder name
- Investigation location
- Investigation observations

Type of investigation indicates whether this is the initial investigation of the incident or whether this is a follow up investigation. If conducting a follow up investigation, indicate the number of the investigation being conducted (2, 3, 4, etc.).

Investigation date is the date that the investigation being documented on the report was conducted.

Investigation time is the time that the investigation being documented on the report was conducted.

Responder name is the name of the individual conducting the investigation.

Investigation location is the location or locations where the investigation occurred. The location could include the street address, latitude, and longitude, or catch basin/outfall ID. A description of the location should be included to accurately define the areas of UMAB that were investigated by the responder.

Investigation observations are the visual observations made by the responder during the investigation. The observations should be as descriptive as possible. If indicators of pollution (odor, color, turbidity, floatables, sheen, or foam) are observed a description of these observations should be included. The observations may result in the determination of the generating site (source) or type of discharge.



SECTION 4.0 | CLEANUP

Stormwater pollutants can be broken into their basic categories: natural pollutants, chemical pollutants, and trash/litter. When a discharge of pollutants occurs from the stormwater system cleanup activities may be necessary to ensure that additional pollutants are not discharged from the source. This could include good housekeeping activities, spill response, or site remediation.

4.1 Natural Pollutants

Natural pollutants include sediment, leaves, or other natural sources that can deplete the water quality of the stormwater discharge. If sediment tracking is observed on construction sites, the facility will notify the contractor of the need to clean up the sediment immediately. If sediment tracking is observed and the contractor is unable to address the discharge source, the Director of Facilities Management or their designee will coordinate cleanup of the sediment by using a street sweeper or other equipment.

As part of UMAB's routine visual inspections of the stormwater system, the sediment accumulation within catch basin sumps is quantified. The facility cleans excess sediment accumulation from within their catch basin system annually, or as needed.

4.2 Chemical Pollutants

The municipal fire department will respond to and coordinate the cleanup of spills and discharges related to hazardous materials.

If the source of the discharge is determined to be the sanitary sewer system or the drinking water system, cleanup activities will be coordinated by UMAB with the City or Bangor Water, as necessary.

If the source of the discharge is determined to be a contaminated groundwater source, the investigation findings regarding the contaminated groundwater source should be referred to the MDEP.

4.3 Trash/Litter

The Director of Facilities Management or their designee will be responsible for removing trash and litter from the stormwater system.



SECTION 5.0 | CORRECTIVE ACTIONS AND ENFORCEMENT

When an incident report or an investigation identify the source of an illicit discharge to be infrastructure failures or illicit connections, corrective actions must be completed to eliminate the source of the discharge to the stormwater system.

5.1 Infrastructure Upgrades

When the source of the discharge is determined to be the sanitary sewer system or the drinking water system, the source will be eliminated by the facility in conjunction with the City of Bangor or Bangor Water, as necessary. Both entities maintain contingency funds in their annual budgets to address these activities.

UMAB maintains a prioritized schedule of maintenance and investment as well as an annual budget for stormwater system repairs. Illicit discharges will take the highest priority practicable.

5.2 Illicit Connection Disconnection

Illicit connections should be disconnected from the stormwater system as soon as possible upon identification.

Where elimination of an illicit discharge within 60 calendar days of its identification and verification as an illicit discharge is not possible, the facility will establish an expeditious schedule for its elimination and report the dates of identification and schedules for removal in annual reports, as required by the Permit. In the interim, UMAB will take all reasonable and prudent measures to minimize the discharge of pollutants to and from the MS4, including follow up screening and inspection to confirm permanent elimination of the discharge.

5.3 Enforcement

UMAB prohibits unauthorized (illicit) discharges to its stormwater system (Haley Ward, 2022). UMAB is also subject to the City's non-stormwater discharge ordinance (*Code of Ordinances, Chapter 197, Non-stormwater Discharges*), which prohibits unauthorized discharges to the City's stormwater system. The City's non-stormwater discharge ordinance establishes the City's legal authority to carry out inspection, monitoring and enforcement activities ensure compliance with its non-stormwater discharge ordinance. UMAB is subject to the enforcement activities therein, which include notices of violation, fines, injunctive relief, etc.



SECTION 6.0 | REFERENCES

EPA, January 2012, *New England Bacterial Source Tracking Protocol – Draft*.

Haley Ward, *University of Maine at Augusta, Bangor Campus, Stormwater Management Plan, 2022*.

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

MDEP, Bureau of Land and Water Quality Division of Watershed Management, June 2017. *Standard Operating Procedures and Visual Monitoring Guidelines for Stormwater Discharges Associated with Industrial Activities*.

MDEP, Bureau of Land and Water Quality, October 2020. *General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4)*.



ATTACHMENT A

EXAMPLE ILLICIT DISCHARGE INVESTIGATION REPORTS



ATTACHMENT B

QUALITY ASSURANCE PROJECT PLAN



HALEY WARD

ENGINEERING | ENVIRONMENTAL | SURVEYING

**ILLICIT DISCHARGE DETECTION
AND ELIMINATION PLAN
QUALITY ASSURANCE PROJECT
PLAN**

FOR

**UNIVERSITY OF MAINE AT AUGUSTA
BANGOR CAMPUS**

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FEBRUARY 2022

JN: 10021.002

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Haley Ward, Inc.

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Attachment 4	Example Equipment Testing, Inspection, and Maintenance Log
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TITLE AND APPROVAL PAGE

Document Title: Illicit Discharge Detection Elimination, Quality Assurance Project Plan

Preparer's Name and Organizational Affiliation:

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Preparation Date:

February 2022

University of Maine at Augusta:

Printed Name and Title

Signature/Date

Haley Ward, Inc.:

Printed Name and Title

Signature/Date



QUALITY ASSURANCE PROJECT PLAN REVIEW AND CERTIFICATION

DATE OF CHANGE/ REVIEW	SECTION AFFECTED	CHANGE	SIGNATURE



SECTION 1 | QAPP DISTRIBUTION

1.1 Distribution List

The University of Maine at Augusta, Bangor Campus (UMAB) Illicit Discharge Detection and Elimination (IDDE) Quality Assurance Project Plan (QAPP) and any subsequent revisions, addenda, and/or amendments shall be distributed to the Personnel identified in the facility Stormwater Management Plan. The method of distribution shall include hard copies and electronic submission via email as detailed in **Table 1**.

TABLE 1 | DISTRIBUTION LIST

QAPP RECIPIENT	TITLE	ORG.	EMAIL ADDRESS	DISTRIB. METHOD
James Kauppila	Director of Facilities Management	UMAB	james.kauppila@umaine.edu	Hard Copy (2) Electronic
Andrea Dickinson	Consultant	Haley Ward, Inc.	adickinson@haleyward.com	Electronic

A hard copy of the IDDE QAPP and any updates shall be maintained by the Director of Facilities Management in a clearly labeled binder at the Facilities Management office.

1.2 Project Organization/Responsibilities

The following table, **Table 2**, identifies personnel involved in the oversight and/or implementation of the IDDE QAPP.

TABLE 2 | IDDE QAPP PERSONNEL

NAME	TITLE	ORGANIZATIONAL AFFILIATION	RESPONSIBILITIES
James Kauppila	Director of Facilities Management	UMAB	Program oversight and implementation.
Andrea Dickinson	Consultant	Haley Ward, Inc.	Program implementation and quality assurance.



SECTION 2 | BACKGROUND

2.1 Background

UMAB is subject to the *General Permit for the Discharge of Stormwater from Small State and Federally Owned Municipal Separate Storm Sewer Systems* (General Permit). The General Permit requires regulated MS4s to develop an Illicit Discharge Detection and Elimination (IDDE) Plan to identify and eliminate illicit discharges. The term “illicit discharge” means 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, or other allowable non-stormwater discharges identified in Part IV(C)(3)(h) of the General Permit. The General Permit requires that the IDDE Plan include a Quality Assurance Project Plan (QAPP) that describes the procedures to be used during the investigation and monitoring of outfalls identified during a dry weather outfall inspection as flowing.

In accordance with the requirements of the General Permit, this QAPP establishes written sampling and quality assurance and quality control (QA/QC) procedures to ensure that sample results collected by UMAB during dry weather inspections can be used to confidently determine the nature of any such flows. **Section 3** of the QAPP establishes sampling procedures, **Section 4** of the QAPP identifies analytical methods and reporting requirements, **Section 5** of the QAPP identifies QA/QC procedures and documentation requirements, **Section 6** of the QAPP identifies sampling documentation that will be maintained by UMAB.

2.2 Sampling Requirements

The General Permit requires dry weather inspections to be conducted on 100% of identified outfalls during the effective term of the General Permit. A list of outfalls that are required to be inspected and a copy of the inspection form are included in **Attachments 1 and 2**. Per General Permit Part IV(C)(3)(e)(iv), flow that is present at an outfall during a dry weather inspection must be sampled and analyzed for the following parameters:

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

Sampling for ammonia and surfactants must use sufficiently sensitive methods to detect said parameters at or below the minimum reporting concentrations as follows:

- Ammonia (0.5 mg/L);
- Surfactants (0.25 mg/L);
- Total residual chlorine (0.05 mg/L);
- E. coli bacteria (4 cfu/100 ml); and
- Enterococcus (10 cfu/100 ml).



Outfalls that are flowing during a dry weather inspection may be exempted from the dry weather investigation sampling required in Part IV(C)(3)(e)(iv) under any of the following conditions:

- The outfall is associated with roadway drainage in undeveloped areas with no dwellings and no sanitary sewers.
- The outfall is associated with only subsurface drainage for any of the following: an athletic field, a park or undeveloped green space and associated parking without services.
- The outfall is from cross-country drainage that neither cross nor are in proximity to sanitary sewer alignments through undeveloped land.
- The contributing pipes to the outfall have been televised in a previous permit cycle and determined to be structurally sound with no illicit connections or connections from structures that could contribute an illicit discharge, and no new construction or redevelopment has occurred in the outfall drainage area since the screening.
- The outfall was screened in accordance with General Permit requirement IV(C)(3)(e)(iv) in a previous permit cycle and no new construction or redevelopment has occurred in the outfall drainage area since the screening.



SECTION 3 | SAMPLING PROCEDURES

Dry weather inspections will be conducted only on pre-scheduled days when there has not been measurable precipitation greater than 1/4 of an inch, or ice or snow melt within the previous 72 hours. Refer to **Attachments 1 and 2** for a list of all outfalls that will be inspected during the permit term and a copy of the outfall inspection form.

If flow is observed at an outfall during a dry weather inspection, that outfall will be sampled in accordance with this QAPP to identify whether the discharge may be illicit.

3.1 Sampling Procedures

Dry weather flow may be transient and/or intermittent. Therefore, dry weather flow must be sampled by inspection personnel at the time of inspection. **Table 3** identifies typical field equipment that should be available to use for sampling during all inspection events.

TABLE 3 | TYPICAL FIELD EQUIPMENT REQUIRED FOR SAMPLING

EQUIPMENT	USE/NOTES
Clipboard	For organization of field sheets and writing surface
Field Sheets	Field sheets for both dry weather inspection and Dry weather sampling should be available with extras
Chain of Custody Forms	To ensure proper handling of all samples
Pens/Pencils/Permanent Markers	For proper labeling
Nitrile Gloves	To protect the sampler as well as the sample from contamination
Flashlight/headlamp w/batteries	For looking in outfalls or manholes, helpful in early mornings as well
Cooler with Ice	For transporting samples to the laboratory
Digital Camera	For documenting field conditions at time of inspection
Personal Protective Equipment (PPE)	Reflective vest, Safety glasses and boots at a minimum
GPS Receiver	For taking spatial location data
Water Quality Sonde	If needed, for sampling conductivity, temperature, pH
Water Quality Meter	Handheld meter, if available, for testing for various water quality parameters such as ammonia, surfactants, and total residual chlorine
Test Kits	Have extra kits on hand to sample more outfalls than are anticipated to be screened in a single day
Label Tape	For labeling sample containers
Sample Containers	Make sure all sample containers are clean. Keep extra sample containers on hand at all times. Make sure there are proper sample containers for what is being sampled for (i.e., bacteria require sterile containers).
Pry Bar or Pick	For opening catch basins and manholes when necessary



EQUIPMENT	USE/NOTES
Small Mallet or Hammer	Helping to free stuck manhole and catch basin covers
Utility Knife	Multiple uses
Measuring Tape	Measuring distances and depth of flow
Safety Cones	Safety
Hand Sanitizer	Disinfectant/decontaminant
Zip Ties/Duct Tape	For making field repairs
Rubber Boots/Waders	For accessing shallow streams/areas
Sampling Pole/Dipper/Sampling Cage	For accessing hard to reach outfalls and manholes

If dry weather flow is determined to be present during a dry weather outfall inspection:

- A grab sample of the dry weather flow will be collected. Grab samples should be taken from the vertical and horizontal center of flow directly into the sample container. Grab samples should be collected by inserting a container under or downstream of a discharge with the container opening facing upstream, and with the opening of the container completely immersed under water, whenever possible. Take the grab sample from the horizontal and vertical center of the flow. If sampling in a channel, avoid stirring up bottom sediments. Avoid touching the inside of the container to prevent contamination.
- Any field measurements will be taken at the same time as the grab sample is collected using the equipment specified in **Table 3** and/or **Table 4**. Field parameters should be allowed to stabilize prior to documentation (i.e., temperature/conductivity, etc.).
- Attention should be given to the time of day that sampling is conducted if there is the potential for the source of the discharge to be the sanitary sewer infrastructure.

Outfalls that are inaccessible due to safety concerns are not required to be inspected but a substitute inspection must be conducted of the first (i.e., closest) accessible inspection location within the stormwater system (e.g., catch basin, manhole, pipe, etc.) that drains to the inaccessible outfall. Accordingly, if a dry weather flow is present at the closest accessible inspection location, it must be sampled.

The following general procedure will be used if dry weather flow samples are collected:

1. Complete a field data sheet (**Attachment 3**).
The field data sheet is used to document the date, time, and location of sample collection; field conditions (temperature, precipitation, weather, etc.); name of sampler; observations relevant to the sample taken; and the results of any sampling results collected in the field.



2. Label sample bottles.

*All samples collected in the field for laboratory analysis will be affixed with a label that includes the project name, sample location, date and time of sample, sampler's initials, analytical parameters, and sample preservation method. If analytical testing will be conducted by a third-party laboratory, the sample bottles should be provided by the laboratory prior to the sampling event. The sampler should coordinate with the off-site and/or third-party laboratory to ensure compliance with holding time and preservation requirements (**Table 4**).*

3. Put on clean protective gloves (nitrile/latex/other) before sampling.
4. If using a pole/dipper/sampling cage to collect the sample, triple rinse the device with distilled water and then in water to be sampled (not for bacteria sampling).
5. Collect sample with pole/dipper/sampling cage or directly in sample containers. *Avoid touching the inside or lip of the sample container or container lid. The sampler should coordinate with the off-site and/or third-party laboratory to ensure that minimum sample volumes are to perform required testing.*
6. Use test strips, test kits, and field meters to sample in-field parameters, as applicable.

Field equipment, such as field meters should be triple rinsed in accordance with Step 4, above. Field equipment must be maintained in accordance with the manufacturer's recommendations. Each meter will have a maintenance log which will be kept in accordance with the documentation standards outlined in Section 5.

7. Place laboratory samples on ice for analysis of contaminants of concern. *All samples will be placed in a cooler immediately after sample collection. The sampler should coordinate with the off-site and/or third-party laboratory to ensure compliance with preservation requirements (**Table 4**).*
8. Fill out chain-of-custody form for samples to be transported to a laboratory (**Section 3.2**).
9. Transport samples to the laboratory within 24-hours of sample collection.

*See **Section 3.2**. The sampler should coordinate with the off-site and/or third-party laboratory to ensure compliance with holding time requirements (**Table 4**).*

10. Dispose of used test strips and test kit ampules properly.

Any disposable equipment (intended for one-time use) will require proper disposal.



11. Decontaminate all reusable testing personnel and equipment.

The decontamination process requires the rinsing of sampling equipment that is expected to be reused using deionized or distilled water. Each piece of equipment will be rinsed twice after each use and before the next use.

When dry weather flow is sampled and analyzed, any deviations from the procedures identified in this QAPP, along with justification for why the changes were made, will be documented by the MS4 on the field data sheet and described in the annual report.

3.2 Sample Handling and Custody

The following procedures will be observed for transporting samples to a laboratory:

- Samples will be closed tightly.
- Bubble wrap will be used on all containers with the potential to break (i.e. glass);
- Samples will be iced during transport;

If a sample will be shipped to a third-party laboratory:

- Fill any empty space or voids within the cooler with bubble wrap or other material;
- Place completed chain of custody in a sealed plastic bag and place in cooler (**Attachment 3**). *A copy of the completed chain of custody should be maintained by the sampler. Prior to shipment, the information provided on the sample label should be compared to the information recorded on the chain of custody for accuracy and consistency. If multiple coolers are being shipped, a chain of custody must be included with each cooler for the specific samples within the cooler.*
- Tape cooler lid shut with packing tape.
- Affix custody seal to cooler lid lip to ensure samples are not tampered with during transport.

An affixed custody seal will be placed on each sample cooler prepared for shipment. The custody seal will be signed and dated and placed on the cooler in a way to determine if the cooler has been tampered with during sample transport.



SECTION 4 | ANALYTICAL METHODS

The General Permit does not require sample analytical methods to comply with the analytical methods codified at 40 CFR Part 136. However, it is recommended that samples be analyzed by Maine Accredited Laboratories¹, where practicable. These actions are expected to improve the quality of sample results, such that they can be used to confidently determine the nature of any dry weather flows. A municipal wastewater treatment plant laboratory may be used for some analyses.

Dry weather flows must be analyzed for:

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

Table 4 identifies other parameters that may be analyzed as part of an illicit discharge investigation, as well as acceptable field and/or analytical methods, sample preservation requirements, and sample holding time requirements.

¹ A list of accredited laboratories is available at: <https://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml>.



TABLE 4 | PARAMETER SPECIFICATIONS

PARAMETER	METHOD OR FIELD EQUIPMENT*	PRESERVATION	HOLDING TIME	SAMPLE CONTAINER
E. Coli	SM 9221B.2, SM 9223B, or EPA 1603	Ice	6 hours to lab; Lab analysis within 2 hours (8 hours total)	From Laboratory
Enterococcus	SM 9230 B, C, or D, or EPA 1603	Ice	6 hours to lab; Lab analysis within 2 hours (8 hours total)	From Laboratory
Fecal Coliform	SM 9221 C E or SM9222D	Ice	6 hours to lab; Lab analysis within 2 hours (8 hours total)	From Laboratory
Human Bacteroides	EMSL Analytical, Inc.; Source Molecular; or EnviroBiomics, Inc.	Ice	N/A; (Recommended: Ship within 24 hours, analysis within 48 hours)	From Laboratory (w/ sodium thiosulfate)
Ammonia (laboratory)	EPA 350.1	Ice	28 days	From Laboratory (w/ sulfuric acid)
Ammonia (field)	Hach DR300 Pocket Colorimeter	None	Immediate (within 15 minutes)	Field Container
Total Residual Chlorine	Hach DR300 Pocket Colorimeter, Low Range	None	Immediate (within 15 minutes)	Field Container
Temperature	Temperature/ Conductivity Probe (YSI)	None	Immediate (within 15 minutes)	Field Container
Conductivity	Conductivity Probe (YSI)	None	Immediate (within 15 minutes)	Field Container
Fluoride	Hach Colorimeter Test Kit	None	Immediate (within 15 minutes)	Field Container
pH	Test Strips	None	Immediate (within 15 minutes)	Field Container



PARAMETER	METHOD OR FIELD EQUIPMENT*	PRESERVATION	HOLDING TIME	SAMPLE CONTAINER
Optical Enhancers	Sterile chlorine-free cotton pad; VWR handheld UV lamp (89131-488)	None	Cotton pad must be dried	Field Container; Light-proof storage
Optical Enhancers	Fluorometer	None	Immediate (within 15 minutes)	Field Container; Light-proof storage
Surfactants (laboratory)	SM 5540 C	Ice	24 hours to lab; Lab analysis within 24 hours (48 hours total)	From Laboratory
Surfactants (field)	CHEMetrics K-9400	None	Immediate (within 15 minutes)	Field Container
Turbidity	Temperature/Conductivity Probe (YSI)	None	Immediate (within 15 minutes)	Field Container

* The methods and field equipment identified in this table may be substituted with similar equipment or methods.

Sampling for ammonia and surfactants must use sufficiently sensitive methods to detect said parameters at or below the minimum reporting concentrations as follows: 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) (**Section 2.2**). Use of the analytical methods in **Table 4** will ensure compliance with these requirements.



SECTION 5 | QUALITY ASSURANCE AND QUALITY CONTROL

Quality Control is a critical part of this sampling and analytical program and is used to allow assessment of the adequacy of results for their intended use. Sample handling quality control measures are discussed in **Section 3.2**.

5.1 Instrument/Equipment Inspection, Maintenance, and Calibration

Field instruments and equipment will be inspected, maintained, and calibrated in accordance with manufacturer recommendations prior to any sampling events. UMAB will maintain a log of all instrument and sampling equipment inspections and any maintenance performed (**Attachment 4**). Expired or damaged field equipment or test kits will not be used for dry weather flow sampling activities. Refer to **Attachment 5** for field equipment specifications and Safety Data Sheets.

Where a laboratory is used to conduct an analysis (bacteria), inspection and maintenance of the laboratory equipment will be the responsibility of the laboratory and shall be made available upon request.

5.2 Data Review

All field data and sample results will be reviewed by UMAB after each sampling event. This includes reviewing calibration records, recordkeeping, data completeness, observation of appropriate holding times, etc. All records may be reviewed by the MDEP or the EPA upon request. Any deficiencies identified will be documented and corrective actions identified. Any required corrective action identified will be addressed immediately and discussed in the annual report.

5.3 Data Reports

All data reports will be reviewed by UMAB upon receipt against the Action Level Criteria identified in the IDDE Plan. If Action Level Criteria (see IDDE Plan) are met or exceeded, UMAB will exact steps outlined in the IDDE Plan to further investigate and eliminate any potential illicit discharges.

Draft reports will not be released without a complete review by UMAB.



SECTION 6 | DOCUMENTATION

Documents and records for this IDDE QAPP are generated through field activities, laboratory processes, and data reviews. Any such documents and will be maintained in accordance with documentation practices identified in the UMAB Stormwater Management Plan (SWMP) and IDDE Plan.

- List of Outfalls;
- Field Data Sheets;
- Chains of Custody;
- Instrument/Equipment Testing, Inspection, and Maintenance Log; and
- Laboratory Reports.

The laboratory will keep a sample receipt log, and all completed chain of custody documentation submitted with the samples. The laboratory will also keep records of all analyses performed, as well as associated quality control information, including laboratory blanks, matrix spikes, laboratory control samples, and laboratory duplicates.

The data generated by the laboratory for each sampling event will be compiled into individual data reports. All laboratory reports will be reviewed by the laboratory's Quality Assurance (QA) Officer before report submittal. Any problems identified during the QA Officer review must be documented in the narrative section of the laboratory report. Laboratory reports associated with outfall monitoring under the IDDE program will be saved in an electronic format by UMAB.



ATTACHMENT 1

DRY WEATHER OUTFALL INSPECTION LIST OF OUTFALLS

UMAB List of Stormwater Outfalls

Infrastructure Identification Number	Description
OF8-CB4	Stormwater Outfall
OF1-CB8	Stormwater Outfall
OF1-CB6	Stormwater Outfall
OF1-CB5	Stormwater Outfall
OF1-CB4	Stormwater Outfall
OF1-CB3	Stormwater Outfall
OF1-CB14	Stormwater Outfall
OF1-CB13	Stormwater Outfall
OF1-CB12	Stormwater Outfall
OF1-CB8	Stormwater Outfall
OF1-CB9	Stormwater Outfall
OF1-CB10	Stormwater Outfall
OF1-CB11	Stormwater Outfall
OF9-CB6	Stormwater Outfall
OF9-CB5	Stormwater Outfall
OF8-CB26	Stormwater Outfall
OF8-CB24	Stormwater Outfall
OF8-CB25	Stormwater Outfall
OF8-CB20	Stormwater Outfall
OF8-CB21	Stormwater Outfall
OF8-CB22	Stormwater Outfall
OF8-CB23	Stormwater Outfall
OF8-CB19	Stormwater Outfall
OF7-CB4	Stormwater Outfall
OF7-CB5	Stormwater Outfall
OF7-CB6	Stormwater Outfall
OF7-CB8	Stormwater Outfall
OF7-CB9	Stormwater Outfall
OF7-CB7	Stormwater Outfall
OF7-CB3	Stormwater Outfall
OF8-CB6	Stormwater Outfall
OF8-CB7	Stormwater Outfall
OF8-CB9	Stormwater Outfall
OF8-CB11	Stormwater Outfall
OF8-CB12	Stormwater Outfall
OF8-CB14	Stormwater Outfall
OF8-CB16	Stormwater Outfall
OF8-CB13	Stormwater Outfall
OF8-CB10	Stormwater Outfall
OF8-CB5	Stormwater Outfall
OF1-CB30	Stormwater Outfall
OF1-CB28	Stormwater Outfall
OF1-CB27	Stormwater Outfall
OF3-CB1	Stormwater Outfall
OF1-CB26	Stormwater Outfall
OF1-CB25	Stormwater Outfall
OF1-CB24	Stormwater Outfall
OF1-CB20	Stormwater Outfall
OF1-CB23	Stormwater Outfall
OF1-CB19	Stormwater Outfall
OF1-CB18	Stormwater Outfall
OF1-CB21	Stormwater Outfall
OF1-CB17	Stormwater Outfall
OF1-CB16	Stormwater Outfall
OF1-CB15	Stormwater Outfall
OF9-CB17	Stormwater Outfall
OF9-CB16	Stormwater Outfall
OF9-CB11	Stormwater Outfall
OF9-CB12	Stormwater Outfall
OF9-CB13	Stormwater Outfall
OF1-CB15	Stormwater Outfall
OF9-CB14	Stormwater Outfall
OF9-CB18	Stormwater Outfall
OF9-CB19	Stormwater Outfall
OF9-CB2	Stormwater Outfall



ATTACHMENT 2

SAMPLE INSPECTION FORM

**UMAB, Stormwater Outfall Inspection,
Information Collected for Each Outfall**

Outfall Inspection Parameters

Outfall ID	
Date	
Inspector	
Temperature	
Rainfall in Previous 24 Hours	
Rainfall in Previous 48 Hours	
Flow Present?	
Flow Description	
Outfall Damage?	
Damage Description	
Flow Present?	
Flow Description	
Odors?	
Odor Description	
Color?	
Color Description	
Turbidity?	
Turbidity Description	
Floatables?	
Floatables Description	
Follow-up Required?	
Notes/Comments	

Note: Other parameters appear on the inspection checklist; however, have been omitted from this list because they are unlikely to change significantly over time. Parameters include, but are not limited to pipe material, size, and location.



ATTACHMENT 3

SAMPLE CHAIN OF CUSTODY

CHAIN OF CUSTODY

CLIENT: _____

ADDRESS: _____

TEL #: _____

TRACKING #: _____

CONTACT: _____

JOB NAME/NUMBER: _____

LOCATION: _____

COLLECTOR: _____

PO #: _____

FIELD IDENTIFICATION	DATE	TIME	SAMPLE MATRIX	CONTAINER VOL/TYPE					ANALYSIS REQUESTED

RELINQUISHED BY: _____ DATE: _____ TIME: _____

RECEIVED BY: _____ DATE: _____ TIME: _____



ATTACHMENT 4

EXAMPLE INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE LOG



ATTACHMENT 5

FIELD EQUIPMENT SPECIFICATIONS AND SAFETY DATA SHEETS



Technical Data Sheet

Detergents (Anionic Surfactants, MBAS) Methylene Blue Method

Applications and Industries: Stormwater, glassware rinsate, drinking water, pharmaceutical cleaning validation

References: APHA Standard Methods, 22nd ed., Method 5540 C - 2000. EPA Methods for Chemical Analysis of Water and Wastes, Method 425.1 (1983). ASTM D 2330-02, Methylene Blue Active Substances.

Chemistry: Methylene blue active substances (MBAS) bring about the transfer of methylene blue, a cationic dye, from an aqueous solution into an immiscible organic solvent. This occurs through ion pair formation by the MBAS anion and the methylene blue cation. The intensity of the blue color in the organic solvent is directly related to the concentration of MBAS in the sample. Anionic surfactants commonly used in commercially available detergent formulations are prominent methylene blue active substances, and are strongly responsive to this chemistry. Test results are expressed as ppm (mg/L) linear alkylbenzene sulfonate (LAS).

Interference Information:

This test is designed for the measurement of anionic surfactants. Positive interferences result from all other MBAS species.

The test does not measure cationic or non-ionic surfactants; however, cationic detergents and other cationic compounds (e.g. amines) may cause a negative interference by competing with methylene blue in the formation of ion pairs.

Organic sulfonates, sulfates, carboxylates, phosphates, and phenols as well as inorganic cyanates and thiocyanates may interfere.

Sulfides may interfere negatively.

Nitrate interferes positively; 10 ppm NO₃-N may read as approximately 0.2 ppm.

Isopropanol at up to 0.1% does not interfere.

Chloride at up to 100 ppm does not interfere significantly. However, because higher chloride levels will interfere positively, this test kit is not recommended for the analysis of brine or seawater samples unless additional sample manipulation is performed. CHEMetrics' Technical Services staff can provide additional information upon request.

NOTE: It is recommended that only the components contained in each kit be used to perform these tests. The reaction tube contained in the visual colorimetric CHEMetrics® test kit is made of polypropylene and the dropper bottle contained in the Instrumental test kit is low-density polyethylene. Use of tubes or bottles made of various other polymers (including polystyrene) is discouraged, as the chloroform in the test reagents may react with these containers.

Safety Information: Safety Data Sheets (SDS) are available upon request and at www.chemetrics.com. Read SDS before using these products. Breaking the tip of a CHEMet™ ampoule in air rather than liquid may cause the glass ampoule to shatter. Wear safety glasses and protective gloves.

Available Analysis Systems: Visual colorimetric: CHEMetrics® Kits. Instrumental colorimetric: Single Analyte Photometer (SAM) Kit.

Storage Requirements: Products should be stored in the dark and at room temperature.

Shelf Life: *When stored in the dark and at room temperature:* Visual colorimetric: The R-9400 CHEMetrics refill has a shelf life of 5 months. The R-9404 CHEMetrics refill has a shelf life of 8 months. The color comparators have 2-year shelf lives. Instrumental colorimetric: The Instrumental refill has a shelf life of 8 months.

Accuracy: CHEMetrics kits: ± 1 color standard increment; Single Analyte Photometer kit: ± 30% error at 0.25 ppm, 0.63 ppm, and 1.88 ppm.

Detergents CHEMets Kit

K-9400/R-9400: 0 - 3 ppm

Test Procedure

1. Rinse the reaction tube with the sample to be tested, and then fill it to the 5 mL mark with the sample.
2. While holding the double-tipped ampoule in a vertical position, snap the upper tip using the tip breaking tool (fig. 1).
3. Invert the ampoule and position the open end over the reaction tube. Snap the upper tip and allow the contents to drain into the reaction tube (fig. 1).
4. Cap the reaction tube and shake it vigorously for **30 seconds**. Allow the tube to stand undisturbed for **1 minute**.
5. Make sure that the flexible tubing is firmly attached to the CHEMet ampoule tip.
6. Insert the CHEMet assembly (tubing first) into the reaction tube making sure that the end of the flexible tubing is at the bottom of the tube. Break the tip of the CHEMet ampoule by gently pressing it against the side of the reaction tube (fig. 2). The ampoule should draw in fluid only from the organic phase (bottom layer).
7. When filling is complete, remove the CHEMet assembly from the reaction tube.
8. Remove the flexible tubing from the CHEMet ampoule and wipe all liquid from the exterior of the ampoule. Place an ampoule cap firmly onto the tip of the CHEMet ampoule. Invert the ampoule several times, allowing the bubble to travel from end to end.

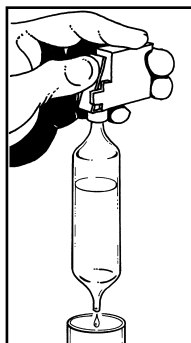


Figure 1

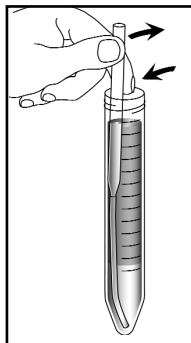


Figure 2

9. Obtain a test result by placing the ampoule, flat end first, into the comparator. Hold the comparator up toward a source of light and view from the bottom. Rotate the comparator until the best color match is found (fig. 3).

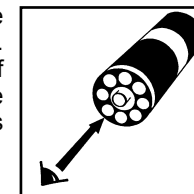


Figure 3

Tip Breaker

The tip breaker opens for easy disposal of the glass tips (pull lever away from body of tip breaker or pull open the side wall). The tip breaker will work most effectively if the tips are emptied out frequently.

Test Method

The Detergents CHEMets^{®1} test kit employs the methylene blue extraction method^{2,3,4}. Anionic detergents react with methylene blue to form a blue complex that is extracted into an immiscible organic solvent. The intensity of the blue color is directly related to the concentration of "methylene blue active substances (MBAS)" in the sample. Anionic detergents are one of the most prominent methylene blue active substances. Test results are expressed in ppm (mg/Liter) linear alkylbenzene sulfonate (equivalent weight 325).

1. CHEMets is a registered trademark of CHEMetrics, Inc. U.S. Patent No. 3,634,038
2. APHA Standard Methods, 22nd ed., Method 5540 C - 2000
3. EPA Methods for Chemical Analysis of Water and Wastes, Method 425.1 (1983)
4. ASTM D 2330-02, Methylene Blue Active Substances

Safety Information

Read SDS (available at www.chemetrics.com) before performing this test procedure. Wear safety glasses and protective gloves.



Simplicity in Water Analysis

www.chemetrics.com

4295 Catlett Road, Midland, VA 22728 U.S.A.

Phone: (800) 356-3072; Fax: (540) 788-4856

E-Mail: orders@chemetrics.com

Feb. 18, Rev. 10

Scroll down for all Safety Data Sheets (SDS) for this product.

Total Enclosures: 2



Simplicity in Water Analysis

Cover Page for Safety Data Sheet

Thank you for choosing CHEMetrics, Inc. We appreciate your business. In order to best serve your needs for accurate and complete Safety Data, we offer the following information as supplemental to the attached SDS.

SDS No.: R9402

Version No.: 3.6

Product Name: Double-Tipped Ampoules for Detergents CHEMets® Kit and Refill and for Detergents Instrumental Test

Components of water analysis reagent sets: Refills R-9400, R-9423; and Kits I-2017, K-9400

Product Descriptions:

Double-Tipped Ampoules: Glass ampoules with dual tapered tips. Each double-tipped ampoule in K-9400 and R-9400 contains approximately 4 mL of liquid reagent. Each double-tipped ampoule in R-9423 contains approximately 9.5 mL of liquid reagent. Refills and test kits contain 20 double-tipped ampoules.

Addendum to Section 14 Transport Information:

Shipping container markings and labels for this product, as received, may vary from the contents of section 14 of the SDS for one or both of the following reasons:

- CHEMetrics has packaged this product as Dangerous Goods in Excepted Quantities according to IATA, US DOT, and IMDG regulations.
- CHEMetrics has packaged this product as part of a test kit or reagent set composed of various chemical reagents and elected to ship as UN 3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

In case of reshipment, it is the responsibility of the shipper to determine appropriate labels and markings in accordance with applicable transportation regulations.

Additional Information:

- "Print Date" = Revision Date (expressed as DD/MM/YYYY)
- Test kits and reagents sets may contain additional chemical reagents. See separate SDS(s).

CHEMets®, VACUettes®, Vacu-vials®, and Titrets® are registered trademarks of CHEMetrics Inc.



Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

CHEMetrics, Inc.

Chemwatch: 9-87557

SDS No: R9402

Version No: 3.6

Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Chemwatch Hazard Alert Code:

Issue Date: 03/02/2018

Print Date: 03/02/2018

Initial Date: 03/02/2018

S.GHS.USA.EN

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test
Synonyms	Not Available
Proper shipping name	Chemical kits; First aid kits
Chemical formula	Not Applicable
Other means of identification	Not Available
CAS number	Not Applicable

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Component of water analysis reagent sets: Refills R-9400, R-9423 and Kits I-2017, K-9400
--------------------------	--

Details of the supplier of the safety data sheet

Registered company name	CHEMetrics, Inc.
Address	4295 Catlett Road, Midland VA 22728 - United States
Telephone	1-540-788-9026
Fax	1-540-788-4856
Website	www.chemetrics.com
Email	technical@chemetrics.com

Emergency telephone number

Association / Organisation	ChemTel, Inc.
Emergency telephone numbers	1-800-255-3924
Other emergency telephone numbers	+01-813-248-0585

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

Classification	Acute Toxicity (Oral) Category 4, Acute Toxicity (Inhalation) Category 3, Skin Corrosion/Irritation Category 2, Serious Eye Damage Category 1, Carcinogenicity Category 2, Reproductive Toxicity Category 2, Specific target organ toxicity - repeated exposure Category 2
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Label elements

Hazard pictogram(s)	
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SIGNAL WORD **DANGER**

Hazard statement(s)

H302	Harmful if swallowed.
H331	Toxic if inhaled.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H351	Suspected of causing cancer.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.

Continued...

Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P271	Use in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P281	Use personal protective equipment as required.
P270	Do not eat, drink or smoke when using this product.

Precautionary statement(s) Response

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P310	Immediately call a POISON CENTER or doctor/physician.
P362	Take off contaminated clothing and wash before reuse.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P301+P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P330	Rinse mouth.
P332+P313	If skin irritation occurs: Get medical advice/attention.

Precautionary statement(s) Storage

P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.
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SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
67-66-3	71	<u>chloroform</u>
7732-18-5	26	<u>water</u>
13472-35-0	2	<u>sodium phosphate, monobasic, dihydrate</u>
7664-93-9	1	<u>sulfuric acid</u>
61-73-4	<0.1	<u>methylene blue</u>
Not Available	<0.1	Proprietary ingredient

SECTION 4 FIRST AID MEASURES

Description of first aid measures

General	
Eye Contact	If this product comes in contact with the eyes: <ul style="list-style-type: none"> ▶ Immediately hold eyelids apart and flush the eye continuously with running water. ▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▶ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. ▶ Transport to hospital or doctor without delay. ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin contact occurs: <ul style="list-style-type: none"> ▶ Immediately remove all contaminated clothing, including footwear. ▶ Flush skin and hair with running water (and soap if available). ▶ Seek medical attention in event of irritation.
Inhalation	<ul style="list-style-type: none"> ▶ If fumes or combustion products are inhaled remove from contaminated area. ▶ Lay patient down. Keep warm and rested. ▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▶ Transport to hospital, or doctor, without delay.
Ingestion	NOTE: IN massive chloroform overdose, DO NOT INDUCE EMESIS because of the rapid onset of CNS depression and the risk of aspiration If poisoning occurs, contact a doctor or Poisons Information Centre. <ul style="list-style-type: none"> ▶ Avoid giving milk or oils. ▶ Avoid giving alcohol. ▶ If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

- ▶ If swallowed do **NOT** induce vomiting.
- ▶ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- ▶ Observe the patient carefully.
- ▶ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- ▶ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- ▶ Seek medical advice.

Most important symptoms and effects, both acute and delayed

See Section 11

Indication of any immediate medical attention and special treatment needed

For chloroform intoxications:

Chloroform concentrations may be determined in blood.

Treat irritation symptomatically.

Oral Management:

Chloroform is radiopaque and X-rays confirm ingestion.

DO NOT INDUCE EMESIS because of the rapid onset of CNS depression and the risk of aspiration.

Consider gastric lavage within 1 hour of ingestion because of very rapid absorption of chloroform (use cuffed ET tube to protect airway)

Contact a poisons information service for further guidance on gut decontamination.

Systematic Management.

All patients initially require at least 24 hours observation with ECG monitoring.

Patients should be kept at complete bed rest, the use of stimulants (including adrenaline and noradrenaline) should be avoided because of the risk of sensitisation of the myocardium.

In symptomatic patients the hepatic and renal function should be monitored for at least 3-days post-exposure.

Chest X-rays will be necessary to monitor development of respiratory complications.

Chloroform depletes glutathione stores; N-acetylcysteine (used in the treatment of paracetamol overdose) has been suggested as a possible antidote for hepatotoxic organic solvents (success in carbon tetrachloride intoxications has been reported).

for intoxication due to Freons/ Halons;

A: Emergency and Supportive Measures

- ▶ Maintain an open airway and assist ventilation if necessary
- ▶ Treat coma and arrhythmias if they occur. Avoid (adrenaline) epinephrine or other sympathomimetic amines that may precipitate ventricular arrhythmias. Tachyarrhythmias caused by increased myocardial sensitisation may be treated with propranolol, 1-2 mg IV or esmolol 25-100 microgm/kg/min IV.
- ▶ Monitor the ECG for 4-6 hours

B: Specific drugs and antidotes:

- ▶ There is no specific antidote

C: Decontamination

- ▶ Inhalation; remove victim from exposure, and give supplemental oxygen if available.
- ▶ Ingestion; (a) Prehospital: Administer activated charcoal, if available. **DO NOT** induce vomiting because of rapid absorption and the risk of abrupt onset CNS depression. (b) Hospital: Administer activated charcoal, although the efficacy of charcoal is unknown. Perform gastric lavage only if the ingestion was very large and recent (less than 30 minutes)

D: Enhanced elimination:

- ▶ There is no documented efficacy for diuresis, haemodialysis, haemoperfusion, or repeat-dose charcoal.

POISONING and DRUG OVERDOSE, Californian Poison Control System Ed. Kent R Olson; 3rd Edition

- ▶ Do not administer sympathomimetic drugs unless absolutely necessary as material may increase myocardial irritability.
- ▶ No specific antidote.
- ▶ Because rapid absorption may occur through lungs if aspirated and cause systematic effects, the decision of whether to induce vomiting or not should be made by an attending physician.
- ▶ If lavage is performed, suggest endotracheal and/or esophageal control.
- ▶ Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach.
- ▶ Treatment based on judgment of the physician in response to reactions of the patient

For acute or short term repeated exposures to strong acids:

- ▶ Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- ▶ Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
- ▶ Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- ▶ Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the desiccating action of the acid on proteins in specific tissues.

INGESTION:

- ▶ Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- ▶ **DO NOT attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.**
- ▶ Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- ▶ Charcoal has no place in acid management.
- ▶ Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:

- ▶ Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- ▶ Deep second-degree burns may benefit from topical silver sulfadiazine.

EYE:

- ▶ Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. **DO NOT use neutralising agents or any other additives.** Several litres of saline are required.
- ▶ Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- ▶ Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).

[Ellenhorn and Barceloux: Medical Toxicology]

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

- ▶ Water spray or fog.
- ▶ Foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.

Special hazards arising from the substrate or mixture

Fire Incompatibility

- ▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Advice for firefighters

Continued...

Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

Fire Fighting	<ul style="list-style-type: none"> ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear breathing apparatus plus protective gloves. ▶ Prevent, by any means available, spillage from entering drains or water courses. ▶ Use fire fighting procedures suitable for surrounding area. ▶ DO NOT approach containers suspected to be hot. ▶ Cool fire exposed containers with water spray from a protected location. ▶ If safe to do so, remove containers from path of fire. ▶ Equipment should be thoroughly decontaminated after use.
Fire/Explosion Hazard	<ul style="list-style-type: none"> ▶ Non combustible. ▶ Not considered to be a significant fire risk. ▶ Acids may react with metals to produce hydrogen, a highly flammable and explosive gas. ▶ Heating may cause expansion or decomposition leading to violent rupture of containers. ▶ May emit corrosive, poisonous fumes. May emit acrid smoke. <p>carbon dioxide (CO2) hydrogen chloride phosgene other pyrolysis products typical of burning organic material. May emit poisonous fumes.</p>

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Minor Spills	<ul style="list-style-type: none"> ▶ Clean up all spills immediately. ▶ Avoid breathing vapours and contact with skin and eyes. ▶ Control personal contact with the substance, by using protective equipment. ▶ Contain and absorb spill with sand, earth, inert material or vermiculite. ▶ Wipe up. ▶ Place in a suitable, labelled container for waste disposal.
Major Spills	<ul style="list-style-type: none"> ▶ Clear area of personnel and move upwind. ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear breathing apparatus plus protective gloves. ▶ Prevent, by any means available, spillage from entering drains or water courses. ▶ No smoking, naked lights or ignition sources. ▶ Increase ventilation. ▶ Stop leak if safe to do so. ▶ Water spray or fog may be used to disperse / absorb vapour. ▶ Contain or absorb spill with sand, earth or vermiculite. ▶ Collect recoverable product into labelled containers for recycling. ▶ Collect solid residues and seal in labelled drums for disposal. ▶ Wash area and prevent runoff into drains. ▶ After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using. ▶ If contamination of drains or waterways occurs, advise emergency services.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	<ul style="list-style-type: none"> ▶ Avoid all personal contact, including inhalation. ▶ Wear protective clothing when risk of exposure occurs. ▶ Use in a well-ventilated area. ▶ Prevent concentration in hollows and sumps. ▶ DO NOT enter confined spaces until atmosphere has been checked. ▶ DO NOT allow material to contact humans, exposed food or food utensils. ▶ Avoid contact with incompatible materials. ▶ When handling, DO NOT eat, drink or smoke. ▶ Keep containers securely sealed when not in use. ▶ Avoid physical damage to containers. ▶ Always wash hands with soap and water after handling. ▶ Work clothes should be laundered separately. Launder contaminated clothing before re-use. ▶ Use good occupational work practice. ▶ Observe manufacturer's storage and handling recommendations contained within this SDS. ▶ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained. <p>Wear impact- and splash-resistant eyewear.</p>
Other information	<ul style="list-style-type: none"> ▶ Store in original containers. ▶ Keep containers securely sealed. ▶ Store in a cool, dry, well-ventilated area. ▶ Store away from incompatible materials and foodstuff containers. ▶ Protect containers against physical damage and check regularly for leaks. ▶ Observe manufacturer's storage and handling recommendations contained within this SDS. <p>For optimum analytical performance, store in the dark and at room temperature.</p>

Conditions for safe storage, including any incompatibilities

Suitable container	<ul style="list-style-type: none"> ▶ DO NOT use aluminium or galvanised containers ▶ Lined metal can, lined metal pail/ can. ▶ Plastic pail. ▶ Polyliner drum. ▶ Packing as recommended by manufacturer. ▶ Check all containers are clearly labelled and free from leaks.
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Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

	<p>For low viscosity materials</p> <ul style="list-style-type: none"> ▶ Drums and jerricans must be of the non-removable head type. ▶ Where a can is to be used as an inner package, the can must have a screwed enclosure. <p>For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):</p> <ul style="list-style-type: none"> ▶ Removable head packaging; ▶ Cans with friction closures and ▶ low pressure tubes and cartridges <p>may be used.</p> <p>-</p> <p>Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages *.</p> <p>-</p> <p>In addition, where inner packagings are glass and contain liquids of packing group I and II there must be sufficient inert absorbent to absorb any spillage *.</p> <p>-</p> <p>* unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.</p> <p>All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.</p>
<p>Storage incompatibility</p>	<p>Chloroform</p> <ul style="list-style-type: none"> ▶ decomposes in the presence of excess water, high temperature, including hot surfaces, evolving phosgene and hydrogen chloride ▶ on contact with warm water may form hydrogen chloride ▶ decomposes at ordinary temperatures in sunlight, in the absence of air, and in the dark in the presence of air ▶ may form explosive materials when mixed with strong bases, alkali metals, lithium, sodium, potassium, sodium-potassium alloys; these may be heat-, friction-, and/or impact sensitive ▶ reacts violently with light metals, aluminium, magnesium or titanium powder, disilane, potassium tert-butoxide, methylates (methoxides), potassium acetylene-1,2-dioxide, sodium amide, uranium(III) hydride ▶ reacts violently with (acetone + a base), (perchloric acid + phosphorous pentoxide), (KOH + methanol) and (NaOH + methanol). ▶ is incompatible with acetone, beryllium, decaborane, methanol, nitrogen tetroxide, strong oxidisers, fluorine, oxygen, potassium, sodium, strong mineral acids, trisopropylphosphine, chemically active metals (Li, NaK alloy), zinc ▶ attacks many plastics and rubber ▶ attacks iron and other metals in the presence of moisture and elevated temperatures ▶ may generate electrostatic charges due to low conductivity <p>Haloalkanes:</p> <ul style="list-style-type: none"> ▶ are highly reactive:some of the more lightly substituted lower members are highly flammable; the more highly substituted may be used as fire suppressants, not always with the anticipated results. ▶ may react with the lighter divalent metals to produce more reactive compounds analogous to Grignard reagents. ▶ may produce explosive compounds following prolonged contact with metallic or other azides ▶ may react on contact with potassium or its alloys - although apparently stable on contact with a wide rage of halocarbons, reaction products may be shock-sensitive and may explode with great violence on light impact; severity generally increases with the degree of halocarbon substitution and potassium-sodium alloys give extremely sensitive mixtures . <p>BREThERICK L.: Handbook of Reactive Chemical Hazards</p> <ul style="list-style-type: none"> ▶ react with metal halides and active metals, eg. sodium (Na), potassium (K), lithium (Li),calcium (Ca), zinc (Zn), powdered aluminium (Al) and aluminium alloys, magnesium (Mg) and magnesium alloys. ▶ may react with brass and steel. ▶ may react explosively with strong oxidisers ▶ may degrade rubber, and plastics such as methacrylate polymers, polyethylene and polystyrene, paint and coatings ▶ Avoid strong bases.

PACKAGE MATERIAL INCOMPATIBILITIES

Not Available

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US NIOSH Recommended Exposure Limits (RELs)	chloroform	Methane trichloride, Trichloromethane	Not Available	9.78 mg/m3 / 2 ppm	Not Available	Ca See Appendix A
US ACGIH Threshold Limit Values (TLV)	chloroform	Chloroform	10 ppm	Not Available	Not Available	TLV® Basis: Liver & embryo/fetal dam; CNS impair
US OSHA Permissible Exposure Levels (PELs) - Table Z1	chloroform	Chloroform (Trichloromethane)	Not Available	Not Available	240 mg/m3 / 50 ppm	Not Available
US NIOSH Recommended Exposure Limits (RELs)	sulfuric acid	Battery acid, Hydrogen sulfate, Oil of vitriol, Sulfuric acid (aqueous)	1 mg/m3	Not Available	Not Available	Not Available
US ACGIH Threshold Limit Values (TLV)	sulfuric acid	Sulfuric acid	0.2 mg/m3	Not Available	Not Available	TLV® Basis: Pulm func
US OSHA Permissible Exposure Levels (PELs) - Table Z1	sulfuric acid	Sulfuric acid	1 mg/m3	Not Available	Not Available	Not Available

EMERGENCY LIMITS


Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
chloroform	Chloroform	2 ppm	Not Available	Not Available
sulfuric acid	Sulfuric acid	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
chloroform	500 ppm	Not Available
water	Not Available	Not Available

Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

sodium phosphate, monobasic, dihydrate	Not Available	Not Available
sulfuric acid	15 mg/m3	Not Available
methylene blue	Not Available	Not Available
Proprietary ingredient	Not Available	Not Available

Exposure controls

Appropriate engineering controls	<p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.</p> <p>Employers may need to use multiple types of controls to prevent employee overexposure.</p> <p>Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. An approved self contained breathing apparatus (SCBA) may be required in some situations.</p> <p>Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Type of Contaminant:</th> <th>Air Speed:</th> </tr> </thead> <tbody> <tr> <td>solvent, vapours, degreasing etc., evaporating from tank (in still air).</td> <td>0.25-0.5 m/s (50-100 f/min.)</td> </tr> <tr> <td>aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)</td> <td>0.5-1 m/s (100-200 f/min.)</td> </tr> <tr> <td>direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)</td> <td>1-2.5 m/s (200-500 f/min.)</td> </tr> <tr> <td>grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).</td> <td>2.5-10 m/s (500-2000 f/min.)</td> </tr> </tbody> </table> <p>Within each range the appropriate value depends on:</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Lower end of the range</th> <th>Upper end of the range</th> </tr> </thead> <tbody> <tr> <td>1: Room air currents minimal or favourable to capture</td> <td>1: Disturbing room air currents</td> </tr> <tr> <td>2: Contaminants of low toxicity or of nuisance value only.</td> <td>2: Contaminants of high toxicity</td> </tr> <tr> <td>3: Intermittent, low production.</td> <td>3: High production, heavy use</td> </tr> <tr> <td>4: Large hood or large air mass in motion</td> <td>4: Small hood-local control only</td> </tr> </tbody> </table> <p>Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.</p>	Type of Contaminant:	Air Speed:	solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min.)	aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)	direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)	grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)	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Personal protection																					
Eye and face protection	<ul style="list-style-type: none"> ▶ Safety glasses with side shields. ▶ Chemical goggles. ▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent] 																				
Skin protection	See Hand protection below																				
Hands/feet protection	<ul style="list-style-type: none"> ▶ Wear chemical protective gloves, e.g. PVC. ▶ Wear safety footwear or safety gumboots, e.g. Rubber 																				
Body protection	See Other protection below																				
Other protection	<ul style="list-style-type: none"> ▶ Overalls. ▶ Eyewash unit. ▶ Barrier cream. ▶ Skin cleansing cream. 																				
Thermal hazards	Not Available																				

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the **computer-generated** selection:

Respiratory protection

Type AB-P Filter of sufficient capacity (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection

Continued...

Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

Material	CPI
BUTYL	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE	C
PE	C
PE/EVAL/PE	C
PVA	C
PVC	C
SARANEX-23	C
TEFLON	C
VITON	C

* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	AB-AUS P2	-	AB-PAPR-AUS / Class 1 P2
up to 50 x ES	-	AB-AUS / Class 1 P2	-
up to 100 x ES	-	AB-2 P2	AB-PAPR-2 P2 ^

^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO₂), G = Agricultural chemicals, K = Ammonia(NH₃), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Two phase: Blue / Colorless		
Physical state	Liquid	Relative density (Water = 1)	1.49 (chloroform layer)
Odour	Characteristic	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Available
pH (as supplied)	1.35 (aqueous layer)	Decomposition temperature	Not Available
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	Not Available	Molecular weight (g/mol)	Not Available
Flash point (°C)	Not Applicable	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water (g/L)	Partly miscible	pH as a solution	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> ▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

Inhaled	<p>Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects. The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of vapours, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.</p> <p>Exposure to vapours of some rare earth salts can cause sensitivity to heat, itching, and increased sensitivity of smell and taste. Other effects include inflamed airways and lung, emphysema, regional narrowing of terminal airways and cell changes.</p> <p>Chloroform concentrations of 1000-2000 parts per million (ppm) may cause dizziness, headache, fatigue, salivation and nausea. 4000 ppm may cause vomiting, serious disorientation and a fainting feeling. 14000-16000 ppm may cause rapid loss of consciousness. More than 20000 ppm may cause breathing failure, heart rhythm disturbances and death. If death does not immediately occur from stoppage of breathing or heart beat, it may occur later from liver and kidney damage.</p> <p>Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness.</p> <p>Acute intoxication by halogenated aliphatic hydrocarbons appears to take place over two stages. Signs of a reversible narcosis are evident in the first stage and in the second stage signs of injury to organs may become evident, a single organ alone is (almost) never involved.</p> <p>Depression of the central nervous system is the most outstanding effect of most halogenated aliphatic hydrocarbons. Inebriation and excitation, passing into narcosis, is a typical reaction. In severe acute exposures there is always a danger of death from respiratory failure or cardiac arrest due to a tendency to make the heart more susceptible to catecholamines (adrenalin)</p>
Ingestion	<p>The material is not thought to produce adverse health effects following ingestion (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum.</p> <p>Symptoms of chloroform ingestion include burning of the mouth, throat, gullet and stomach; diarrhoea and abdominal/lower chest pain; cold, clammy skin, blueness of the extremities and face, muscle cramps, dilated pupils, low blood pressure, blood vessel dilatation on the periphery, irregular breathing, respiratory failure, unconsciousness and liver damage.</p> <p>Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident.</p>
Skin Contact	<p>The material may accentuate any pre-existing dermatitis condition</p> <p>Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p> <p>The material may cause mild but significant inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering.</p>
Eye	<p>If applied to the eyes, this material causes severe eye damage.</p> <p>Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely.</p>
Chronic	<p>Repeated or long-term occupational exposure is likely to produce cumulative health effects involving organs or biochemical systems. There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment. Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.</p> <p>Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs.</p> <p>Long term exposure to chloroform may produce dizziness, fatigue, drowsiness, memory impairment, increased dreams, loss of appetite, palpitations, liver and kidney damage. There may be depression, confusion, negative changes in behaviour and passive mood states. Chronic abuse of chloroform may cause psychotic behaviour. Repeated exposure may also cause dullness, urinary frequency, gastrointestinal disturbances, dry mouth, thirst, headache, general unwellness, blurred vision, pins and needles, loss of sense of balance, tremors, memory and anaemia. It may be dangerous to the foetus (unborn baby). It has been shown to induce liver, kidney, intestinal and urinary bladder tumours, including cancer.</p>

Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	TOXICITY	IRRITATION
Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	TOXICITY	IRRITATION

CHLOROFORM	<p>The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.</p> <p>WARNING: This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans. Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen [National Toxicology Program: U.S. Dep. of Health & Human Services 2002]</p>
WATER	No significant acute toxicological data identified in literature search.
SODIUM PHOSPHATE, MONOBASIC, DIHYDRATE	Data for anhydride
SULFURIC ACID	<p>Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.</p>

Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

	<p>WARNING: For inhalation exposure <u>ONLY</u>: This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS</p> <p>Occupational exposures to strong inorganic acid mists of sulfuric acid:</p>
METHYLENE BLUE	<p>The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing. After i.v. administration Methylene Blue may cause nausea, vomiting, abdominal and chest pain, headache, dizziness, mental confusion, profuse sweating, and hypertension; with very high doses methaemoglobinemia and a hemolysis may occur. Methylene Blue activates a normally dormant reductase enzyme system which reduces the methylene blue to leucomethylene blue, which in turn is able to reduce methaemoglobin to haemoglobin. Methylene Blue is absorbed from the gastrointestinal tract. It is believed to be reduced in the tissues to the leuco form which is slowly excreted, mainly in the urine together with some unchanged drug. Methylene Blue imparts a blue color to urine and faeces. In large doses Methylene Blue can produce methaemoglobinaemia. Although intra-amniotic injection of Methylene Blue has been used to diagnose premature rupture of fetal membranes or to identify separate amniotic sacs in twin pregnancies, there have been several reports of hemolytic anemia (Heinz-body anemia) and hyperbilirubinemia in neonates exposed to Methylene Blue in the amniotic cavity. In most cases, exchange transfusions and/or phototherapy are required to control the jaundice. Methylene Blue should be used with caution in the treatment of toxic methemoglobinemia; high doses can cause hemolytic anemias and patients with glucose-6-phosphate dehydrogenase (G6PD) deficiencies are particularly susceptible. A rapid disappearance of cyanosis in response to Methylene Blue would be expected within one hour but might not occur if the patient has erythrocyte G6PD or NADPH-diaphorase deficiency or if methemoglobinemia is due to the ingestion of compounds such as aniline or dapsone. A second dose has been recommended if cyanosis does not disappear within 1 hour of Methylene Blue administration but results of a study in animals and of a patient with aniline poisoning indicated that an increased dosage of Methylene Blue might be of no additional benefit and could be potentially dangerous in that it could enhance Heinz body formation. Methylene Blue should not be injected s.c. as it may cause necrotic abscesses. It should not be given by intrathecal injection as neural damage has occurred. Methylene Blue should be used with caution in patients with glucose-6-phosphate dehydrogenase deficiency.</p>

Acute Toxicity	✓	Carcinogenicity	✓
Skin Irritation/Corrosion	✓	Reproductivity	✓
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	⊘
Respiratory or Skin sensitisation	⊘	STOT - Repeated Exposure	✓
Mutagenicity	⊘	Aspiration Hazard	⊘

Legend: ✓ – Data available to make classification
 ✗ – Data available but does not fill the criteria for classification
 ⊘ – Data Not Available to make classification

CMR STATUS

Not Applicable

REPROTOXIN	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available
CARCINOGEN	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available
MUTAGEN	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available
EYE	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available
RESPIRATORY	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available
SKIN	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

NOT AVAILABLE

Ingredient	Endpoint	Test Duration (hr)	Effect	Value	Species	BCF
Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
chloroform	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
water	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
sodium phosphate, monobasic, dihydrate	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
sulfuric acid	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
methylene blue	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available

For Haloalkanes:

Atmospheric Fate: Fully, or partially, fluorinated haloalkanes released to the air can restrict heat loss from the Earth's atmosphere by absorbing infrared emissions from the surface. The major fate of haloalkanes in the atmosphere is via breakdown by hydroxyl radicals. These substances react with atmospheric ozone and nitrates, which also causes them to change, (transform). Chlorofluorocarbons, (CFC), haloalkanes can break down into chlorine atoms in the air, which also contribute to ozone destruction.
 Terrestrial Fate: Biological breakdown of these substances is expected to be faster than non-biological breakdown, provided that there are sufficient substrates, nutrients and microbial populations. However, because haloalkane-degrading microorganisms are not easily found, biological breakdown of these substances is rare. Several methane-utilizing bacteria have been identified that may use haloalkanes. Biological breakdown may occur through various pathways.
 Aquatic Fate: Haloalkanes do not easily break down in water. Biological breakdown of these substances is expected to be faster than non-biological breakdown, provided that there are sufficient substrates, nutrients and microbial populations. In general, alpha- and alpha, omega-chlorinated haloalkanes are de-halogenated by water. Alpha- and alpha, omega-haloalkanes with longer chains, may be de-halogenated by the addition of oxygen, (oxidized). Haloalkanes may break down in water, if certain sulfur ions are present, such as bisulfide ions.

Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

Ecotoxicity: Haloparaffins C12 to C18 may be incorporated into fatty acids in bacteria, yeasts, and fungi, resulting in their build up in the food chain. Haloalkanes are persistent and toxic to fish and wildlife.

Ecotoxicity:

The tolerance of water organisms towards pH margin and variation is diverse. Recommended pH values for test species listed in OECD guidelines are between 6.0 and almost 9. Acute testing with fish showed 96h-LC50 at about pH 3.5

For Chloroform:

log Kow: 1.97; Koc: 34; Half-life (hr) air: 1920; Half-life (hr) H₂O surface water: 28 744; Henry's atm m³/mol: 4.35E-03; BOD 5: 0.02; ThOD: 0.33,1.346; BCF: 1.9-10.35. Drinking Water Standard - Hydrocarbon total: 10 ug/l (UK max.); Chloroform: 200 ug/l (WHO guideline); Soil Guidelines - Dutch criteria: 0.001 mg/kg.

Atmospheric Fate: Chloroform will generally evaporate to atmosphere; however, transportation may occur over long distances and photo-oxidization will occur (half-life 80 days). Chloroform is expected to exist almost entirely in the vapor phase in the atmosphere. Large amounts of chloroform in the atmosphere may be removed during precipitation; however, most chloroform removed in precipitation is likely to re-enter the atmosphere by volatilization. Long-range atmospheric transport of chloroform is possible. The major degradation process in the air involves reactions with free radicals such as hydroxyl groups. Breakdown products include phosgene and hydrogen chloride. Chloroform is more reactive in photochemical smog conditions where the approximate half-life is 11 days.

Aquatic Fate: Direct photolysis of chloroform will not be a significant degradation process in surface waters and the dominant fate process for chloroform in surface waters is volatilization.

Chloroform present in surface water is expected to volatilize rapidly to the atmosphere. A half-life of 44 hours for volatilization has been estimated.

Terrestrial Fate: Spills and releases on land will evaporate quickly or leach into groundwater where they persist for long periods. Chloroform is not expected to adsorb significantly to sediment or suspended organic matter in surface waters. In soil, the dominant transport mechanism for chloroform near the surface will probably be volatilization with relatively constant rates over a wide variety of soil types.

Ecotoxicity: Chloroform is not expected to concentrate in the food chain. Chloroform does not appear to bioconcentrate in higher aquatic organisms including bluegill sunfish but, has a moderate tendency to concentrate in nonvascular aquatic plants such as green algae. Significant degradation of chloroform under aerobic conditions has been reported in tests. Under the proper conditions, chloroform appears to be much more susceptible to anaerobic biodegradation. Above certain dosage levels, chloroform becomes toxic to anaerobic and aerobic microorganisms. This is especially noticeable for biological treatment facilities that use anaerobic digestion systems, where sustained inputs with chloroform concentrations approaching 100 mg/L can all but eliminate methane fermenting bacteria.

For Cerium:

Environmental Fate: Despite their name, rare earth elements are relatively plentiful in the Earth's crust, with cerium being the 25th most abundant element. Cerium compounds include cerium oxide, cerium carbonate, and cerium chloride.

Atmospheric Fate: Cerium oxidizes very readily at room temperature, especially in moist air. Except for europium, cerium is the most reactive of the rare-earth metals.

Terrestrial Fate: Soil ♦ Cerium is found in minerals including allanite, monazite, cerite, and bastnaesite. Plants ♦ Crops can take up cerium.

Aquatic Fate: Cerium oxide and cerium carbonate are insoluble in water, while cerium chloride is soluble in water. Cerium has affinity for humic substances, which may alter its availability in aquatic systems. The substance slowly decomposes in cold water, and rapidly decomposes in hot water. Alkali solutions and dilute/concentrated acids attack the metal rapidly.

Ecotoxicity: Current fate and transport studies are limited and may not adequately address long term environmental exposure risks to both humans and other living organisms. Although cerium has low acute toxicity, long term health and environmental effects are less well understood. The form cerium takes can also influence its biological and environmental fate. Oxides and hydroxides of cerium are poorly soluble in body fluids thus are slow to clear from the organism. Cerium can affect the respiratory tract and associated lymph nodes, (inhalation exposure), and, once in the circulatory system, can partition to the skeleton, liver, kidney and spleen. Studies subjecting animals to large dosages of cerium show evidence of neurological effects, possibly due to cerium competing with calcium binding sites in the brain. Long term human expose to cerium is correlated with rare earth pneumoconiosis, but, the precise role of cerium in this disease is not well characterized.

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
chloroform	HIGH (Half-life = 1800 days)	HIGH (Half-life = 259.63 days)
water	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
chloroform	LOW (BCF = 13)
water	LOW (LogKOW = -1.38)

Mobility in soil

Ingredient	Mobility
chloroform	LOW (KOC = 35.04)
water	LOW (KOC = 14.3)


SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> ▶ ▶ ▶ Dispose of according to federal, state, and local regulations. ▶
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SECTION 14 TRANSPORT INFORMATION

Labels Required

	
Marine Pollutant	NO

Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

Land transport (DOT)

UN number	3316
Packing group	II
UN proper shipping name	Chemical kits; First aid kits
Environmental hazard	No relevant data
Transport hazard class(es)	Class : 9
Special precautions for user	Hazard Label : 9 Special provisions : 15

Air transport (ICAO-IATA / DGR)

UN number	3316
Packing group	II
UN proper shipping name	Chemical kit; First aid kit
Environmental hazard	No relevant data
Transport hazard class(es)	ICAO/IATA Class : 9 ICAO / IATA Subrisk : Not Applicable ERG Code : 9L
Special precautions for user	Special provisions : A44 A163 Cargo Only Packing Instructions : 960 Cargo Only Maximum Qty / Pack : 10 kg Passenger and Cargo Packing Instructions : 960 Passenger and Cargo Maximum Qty / Pack : 10 kg Passenger and Cargo Limited Quantity Packing Instructions : Y960 Passenger and Cargo Limited Maximum Qty / Pack : 1 kg

Sea transport (IMDG-Code / GGVSee)

UN number	3316
Packing group	II
UN proper shipping name	CHEMICAL KIT or FIRST AID KIT
Environmental hazard	Not Applicable
Transport hazard class(es)	IMDG Class : 9 IMDG Subrisk : Not Applicable
Special precautions for user	EMS Number : F-A , S-P Special provisions : 251 340 Limited Quantities : See SP251

Transport in bulk according to Annex II of MARPOL and the IBC code

Source	Ingredient	Pollution Category
	Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test	

SECTION 15 REGULATORY INFORMATION**Safety, health and environmental regulations / legislation specific for the substance or mixture**

<p>chloroform(67-66-3) is found on the following regulatory lists</p>	<p>"International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs", "US - Alaska Limits for Air Contaminants", "US - California - Proposition 65 - Priority List for the Development of MADLs for Chemicals Causing Reproductive Toxicity", "US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELS)", "US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)", "US - California Permissible Exposure Limits for Chemical Contaminants", "US - California Proposition 65 - Carcinogens", "US - California Proposition 65 - No Significant Risk Levels (NSRLs) for Carcinogens", "US - California Proposition 65 - Reproductive Toxicity", "US - Hawaii Air Contaminant Limits", "US - Idaho - Limits for Air Contaminants", "US - Massachusetts - Right To Know Listed Chemicals", "US - Michigan Exposure Limits for Air Contaminants", "US - Minnesota Permissible Exposure Limits (PELs)", "US - New Jersey Right to Know - Special Health Hazard Substance List (SHHSL): Carcinogens", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Pennsylvania - Hazardous Substance List", "US - Rhode Island Hazardous Substance List", "US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants", "US - Washington Permissible exposure limits of air contaminants", "US - Washington Toxic air pollutants and their ASIL, SQER and de minimis emission values", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US ACGIH Threshold Limit Values (TLV)", "US ACGIH Threshold Limit Values (TLV) - Carcinogens", "US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)", "US Clean Air Act - Hazardous Air Pollutants", "US CWA (Clean Water Act) - List of Hazardous Substances", "US CWA (Clean Water Act) - Priority Pollutants", "US CWA (Clean Water Act) - Toxic Pollutants", "US EPA Carcinogens Listing", "US EPCRA Section 313 Chemical List", "US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule", "US National Toxicology Program (NTP) 14th Report Part B. Reasonably Anticipated to be a Human Carcinogen", "US NIOSH Recommended Exposure Limits (RELs)", "US Office of Environmental Health Hazard Assessment Proposition 65 No Significant Risk Levels (NSRLs) for Carcinogens and Maximum Allowable Dose Levels (MADLs) for Chemicals Causing Reproductive Toxicity", "US</p>
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Double-Tipped Ampoules for Detergents CHEMets Kit and Refill and for Detergents Instrumental Test

	OSHA Permissible Exposure Levels (PELs) - Table Z1", "US SARA Section 302 Extremely Hazardous Substances", "US Spacecraft Maximum Allowable Concentrations (SMACs) for Airborne Contaminants", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US TSCA Chemical Substance Inventory - Interim List of Active Substances", "US TSCA New Chemical Exposure Limits (NCEL)"
water(7732-18-5) is found on the following regulatory lists	"US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US TSCA Chemical Substance Inventory - Interim List of Active Substances"
sodium phosphate, monobasic, dihydrate(13472-35-0) is found on the following regulatory lists	"US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US TSCA Chemical Substance Inventory - Interim List of Active Substances"
sulfuric acid(7664-93-9) is found on the following regulatory lists	"International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs", "International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft", "US - Alaska Limits for Air Contaminants", "US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)", "US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)", "US - California Permissible Exposure Limits for Chemical Contaminants", "US - Hawaii Air Contaminant Limits", "US - Idaho - Limits for Air Contaminants", "US - Massachusetts - Right To Know Listed Chemicals", "US - Michigan Exposure Limits for Air Contaminants", "US - Minnesota Permissible Exposure Limits (PELs)", "US - New Jersey Right to Know - Special Health Hazard Substance List (SHHSL): Carcinogens", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Pennsylvania - Hazardous Substance List", "US - Rhode Island Hazardous Substance List", "US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants", "US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants", "US - Washington Permissible exposure limits of air contaminants", "US - Washington Toxic air pollutants and their ASIL, SQER and de minimis emission values", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US ACGIH Threshold Limit Values (TLV)", "US ACGIH Threshold Limit Values (TLV) - Carcinogens", "US CWA (Clean Water Act) - List of Hazardous Substances", "US Drug Enforcement Administration (DEA) List I and II Regulated Chemicals", "US EPCRA Section 313 Chemical List", "US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule", "US National Toxicology Program (NTP) 14th Report Part A Known to be Human Carcinogens", "US NIOSH Recommended Exposure Limits (RELs)", "US OSHA Permissible Exposure Levels (PELs) - Table Z1", "US SARA Section 302 Extremely Hazardous Substances", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US TSCA Chemical Substance Inventory - Interim List of Active Substances"
methylene blue(61-73-4) is found on the following regulatory lists	"International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"
Proprietary ingredient() is found on the following regulatory lists	"Not Applicable"

SECTION 16 OTHER INFORMATION

Other information

Ingredients with multiple cas numbers

Name	CAS No
Not Available	Not Available

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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Simplicity in Water Analysis

Cover Page for Safety Data Sheet

Thank you for choosing CHEMetrics, Inc. We appreciate your business. In order to best serve your needs for accurate and complete Safety Data, we offer the following information as supplemental to the attached SDS.

SDS No.: R1001

Version No.: 2.2

Product Name: CHEMetrics® Ampoules for Filming Amines CHEMetrics® Kit & Refill (R-1001) and for Detergents CHEMetrics® Kit & Refill (R-9401)

Component of water analysis reagent sets: Refills R-1000, R-1000E, R-9400, R-9404 and Test Kits K-1001, K-1001E, K-9400, K-9404

Product Descriptions:

CHEMetrics Ampoules: Sealed glass ampoules, 7 mm OD, for visual colorimetric water analysis. Each CHEMet™ ampoule contains approximately 0.25 mL of liquid reagent sealed under vacuum. The refills and kits contain 20 CHEMetrics ampoules.

Addendum to Section 14 Transport Information:

Shipping container markings and labels for this product, as received, may vary from the contents of section 14 of the SDS for one or both of the following reasons:

- CHEMetrics has packaged this product as Dangerous Goods in Excepted Quantities according to IATA, US DOT, and IMDG regulations.
- CHEMetrics has packaged this product as part of a test kit or reagent set composed of various chemical reagents and elected to ship as UN 3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

In case of reshipment, it is the responsibility of the shipper to determine appropriate labels and markings in accordance with applicable transportation regulations.

Additional Information:

- "Print Date" = Revision Date (expressed as DD/MM/YYYY)
- Test kits and reagents sets may contain additional chemical reagents. See separate SDS(s).

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CHEMetrics Ampoules for Filming Amines CHEMetrics Kit & Refill (R-1001) and for Detergents CHEMetrics Kit & Refill (R-9401)

CHEMetrics, Inc.

Chemwatch Hazard Alert Code: 3

Chemwatch: 9-92655
SDS No: R1001
Version No: 2.2
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Issue Date: 03/11/2014
Print Date: 12/03/2015
Initial Date: 05/11/2014
S.GHS.USA.EN

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	CHEMetrics Ampoules for Filming Amines CHEMetrics Kit & Refill (R-1001) and for Detergents CHEMetrics Kit & Refill (R-9401)
Synonyms	Not Available
Proper shipping name	Chemical kits First aid kits
Chemical formula	Not Applicable
Other means of identification	Not Available
CAS number	Not Applicable

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Component of water analysis reagent sets: refills R-1000, R-1000E, R-9400, R-9404 and test kits K-1001, K-1001E, K-9400, K-9404
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Details of the manufacturer/importer

Registered company name	CHEMetrics, Inc.
Address	4295 Catlett Road, Midland, VA. 22728 United States
Telephone	1-540-788-9026
Fax	1-540-788-4856
Website	www.chemetrics.com
Email	technical@chemetrics.com

Emergency telephone number

Association / Organisation	ChemTel Inc.
Emergency telephone numbers	1-800-255-3924
Other emergency telephone numbers	+01-813-248-0585

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS Classification	Flammable Liquid Category 3, Serious Eye Damage Category 1, STOT - SE (Narcosis) Category 3
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Label elements

GHS label elements	
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SIGNAL WORD **DANGER**

Hazard statement(s)

H226	Flammable liquid and vapour
H318	Causes serious eye damage
H336	May cause drowsiness or dizziness

Precautionary statement(s) Prevention

Continued...

CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P103	Read label before use.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P240	Ground/bond container and receiving equipment.

Precautionary statement(s) Response

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor/physician/first aider
P370+P378	In case of fire: Use alcohol resistant foam or fine spray/water fog for extinction.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Precautionary statement(s) Storage

P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised chemical landfill or if organic to high temperature incineration
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SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
71-23-8	98	n-propanol
7732-18-5	2	water

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> ▶ Immediately hold eyelids apart and flush the eye continuously with running water. ▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▶ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. ▶ Transport to hospital or doctor without delay. ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> ▶ Flush skin and hair with running water (and soap if available). ▶ Seek medical attention in event of irritation.
Inhalation	<ul style="list-style-type: none"> ▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area. ▶ Other measures are usually unnecessary.
Ingestion	<ul style="list-style-type: none"> ▶ Immediately give a glass of water. ▶ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor. ▶ If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

Indication of any immediate medical attention and special treatment needed

To treat poisoning by the higher aliphatic alcohols (up to C7):

- ▶ Gastric lavage with copious amounts of water.
- ▶ It may be beneficial to instill 60 ml of mineral oil into the stomach.
- ▶ Oxygen and artificial respiration as needed.
- ▶ Electrolyte balance: it may be useful to start 500 ml. M/6 sodium bicarbonate intravenously but maintain a cautious and conservative attitude toward electrolyte replacement unless shock or severe acidosis threatens.
- ▶ To protect the liver, maintain carbohydrate intake by intravenous infusions of glucose.
- ▶ Haemodialysis if coma is deep and persistent. [GOSSELIN, SMITH HODGE: Clinical Toxicology of Commercial Products, Ed 5]

BASIC TREATMENT

- ▶ Establish a patent airway with suction where necessary.
- ▶ Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- ▶ Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- ▶ Monitor and treat, where necessary, for shock.
- ▶ Monitor and treat, where necessary, for pulmonary oedema.
- ▶ Anticipate and treat, where necessary, for seizures.

CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

- ▶ **DO NOT use emetics.** Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.
- ▶ Give activated charcoal.

ADVANCED TREATMENT

- ▶ Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- ▶ Positive-pressure ventilation using a bag-valve mask might be of use.
- ▶ Monitor and treat, where necessary, for arrhythmias.
- ▶ Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- ▶ If the patient is hypoglycaemic (decreased or loss of consciousness, tachycardia, pallor, dilated pupils, diaphoresis and/or dextrose strip or glucometer readings below 50 mg), give 50% dextrose.
- ▶ Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- ▶ Drug therapy should be considered for pulmonary oedema.
- ▶ Treat seizures with diazepam.
- ▶ Proparacaine hydrochloride should be used to assist eye irrigation.

EMERGENCY DEPARTMENT

- ▶ Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime. Other useful analyses include anion and osmolar gaps, arterial blood gases (ABGs), chest radiographs and electrocardiograph.
- ▶ Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.
- ▶ Acidosis may respond to hyperventilation and bicarbonate therapy.
- ▶ Haemodialysis might be considered in patients with severe intoxication.
- ▶ Consult a toxicologist as necessary. BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

For C8 alcohols and above.

Symptomatic and supportive therapy is advised in managing patients.

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

- ▶ Alcohol stable foam.
- ▶ Dry chemical powder.
- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.
- ▶ Water spray or fog - Large fires only.

Special hazards arising from the substrate or mixture

Fire Incompatibility

- ▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Advice for firefighters

Fire Fighting

- ▶ Alert Fire Brigade and tell them location and nature of hazard.
- ▶ Wear full body protective clothing with breathing apparatus.
- ▶ Prevent, by any means available, spillage from entering drains or water course.
- ▶ Use water delivered as a fine spray to control fire and cool adjacent area.
- ▶ Avoid spraying water onto liquid pools.

Fire/Explosion Hazard

- ▶ Combustible.
- ▶ Slight fire hazard when exposed to heat or flame.
- ▶ Heating may cause expansion or decomposition leading to violent rupture of containers.
- ▶ On combustion, may emit toxic fumes of carbon monoxide (CO).
- ▶ May emit acid smoke.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Minor Spills

- ▶ Remove all ignition sources.
- ▶ Clean up all spills immediately.
- ▶ Avoid breathing vapours and contact with skin and eyes.
- ▶ Control personal contact with the substance, by using protective equipment.
- ▶ Contain and absorb small quantities with vermiculite or other absorbent material.

Major Spills

- Moderate hazard.
- ▶ Clear area of personnel and move upwind.
 - ▶ Alert Fire Brigade and tell them location and nature of hazard.
 - ▶ Wear breathing apparatus plus protective gloves.
 - ▶ Prevent, by any means available, spillage from entering drains or water course.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling

- ▶ **DO NOT allow clothing wet with material to stay in contact with skin**
- ▶ Avoid all personal contact, including inhalation.
- ▶ Wear protective clothing when risk of exposure occurs.
- ▶ Use in a well-ventilated area.
- ▶ Prevent concentration in hollows and sumps.
- ▶ **DO NOT enter confined spaces until atmosphere has been checked.**

CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

	<p>Wear impact- and splash-resistant eyewear. Break the ampoule tip only when it is completely immersed in sample. Breaking the tip in air may cause the glass ampoule to shatter.</p>
Other information	<ul style="list-style-type: none"> ▶ Store in original containers. ▶ Keep containers securely sealed. ▶ Store in a cool, dry, well-ventilated area. ▶ Store away from incompatible materials and foodstuff containers. ▶ Protect containers against physical damage and check regularly for leaks. <p>For optimum analytical performance, store in the dark and at room temperature.</p>

Conditions for safe storage, including any incompatibilities

Suitable container	<ul style="list-style-type: none"> ▶ Metal can or drum ▶ Packaging as recommended by manufacturer. ▶ Check all containers are clearly labelled and free from leaks.
Storage incompatibility	<p>Alcohols</p> <ul style="list-style-type: none"> ▶ are incompatible with strong acids, acid chlorides, acid anhydrides, oxidising and reducing agents. ▶ reacts, possibly violently, with alkaline metals and alkaline earth metals to produce hydrogen ▶ react with strong acids, strong caustics, aliphatic amines, isocyanates, acetaldehyde, benzoyl peroxide, chromic acid, chromium oxide, dialkylzincs, dichlorine oxide, ethylene oxide, hypochlorous acid, isopropyl chlorocarbonate, lithium tetrahydroaluminate, nitrogen dioxide, pentafluoroguanidine, phosphorus halides, phosphorus pentasulfide, tangerine oil, triethylaluminium, triisobutylaluminium ▶ should not be heated above 49 deg. C. when in contact with aluminium equipment

PACKAGE MATERIAL INCOMPATIBILITIES

Not Available

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA


Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US OSHA Permissible Exposure Levels (PELs) - Table Z1	n-propanol	n-Propyl alcohol	500 mg/m ³ / 200 ppm	Not Available	Not Available	Not Available
US ACGIH Threshold Limit Values (TLV)	n-propanol	n-Propanol (n-Propyl alcohol)	100 ppm	Not Available	Not Available	TLV® Basis: Eye & URT irr
US NIOSH Recommended Exposure Limits (RELs)	n-propanol	Ethyl carbinol, 1-Propanol, n-Propanol, Propyl alcohol	500 mg/m ³ / 200 ppm	625 mg/m ³ / 250 ppm	Not Available	[skin]

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
n-propanol	Propyl alcohol, n-; (n-Propanol)	250 ppm	250 ppm	4000 ppm

Ingredient	Original IDLH	Revised IDLH
n-propanol	4,000 ppm	800 ppm
water	Not Available	Not Available

Exposure controls

Appropriate engineering controls	<p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.</p> <p>The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly.</p>
Personal protection	
Eye and face protection	<ul style="list-style-type: none"> ▶ Safety glasses with side shields. ▶ Chemical goggles. ▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience.
Skin protection	See Hand protection below
Hands/feet protection	<p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <p>The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.</p> <p>Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:</p> <ul style="list-style-type: none"> ▶ frequency and duration of contact, ▶ chemical resistance of glove material, ▶ glove thickness and ▶ dexterity

Continued...

CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

	Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).
Body protection	See Other protection below
Other protection	<ul style="list-style-type: none"> ▶ Overalls. ▶ P.V.C. apron. ▶ Barrier cream. ▶ Skin cleansing cream.
Thermal hazards	Not Available

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the **computer-generated** selection:

CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

Material	CPI
NEOPRENE	A
VITON	B
BUTYL	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE	C
NITRILE+PVC	C
PVA	C
PVC	C
TEFLON	C

* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

Respiratory protection

Type A Filter of sufficient capacity, (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	Air-line*	A-2	A-PAPR-2 ^
up to 20 x ES	-	A-3	-
20+ x ES	-	Air-line**	-

* - Continuous-flow; ** - Continuous-flow or positive pressure demand

^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO₂), G = Agricultural chemicals, K = Ammonia(NH₃), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	colorless, may contain black particles		
Physical state	Liquid	Relative density (Water = 1)	0.8
Odour	Characteristic	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	413
pH (as supplied)	Not Available	Decomposition temperature	Not Available
Melting point / freezing point (°C)	-127	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	97	Molecular weight (g/mol)	Not Available
Flash point (°C)	23	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Flammable.	Oxidising properties	Not Available
Upper Explosive Limit (%)	13.5	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	2.1	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water (g/L)	Miscible	pH as a solution	8.5
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
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CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

Chemical stability	<ul style="list-style-type: none"> ▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo. Subjects unacclimatised to n-propanol exposure experienced mild irritation of the eyes, nose and throat at a concentration of 400 parts per million.
Ingestion	Overexposure to non-ring alcohols causes nervous system symptoms. These include headache, muscle weakness and inco-ordination, giddiness, confusion, delirium and coma. The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.
Skin Contact	The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting. The calculated human skin permeability coefficient for n-propanol by the U.S. Environment Protection Agency is 1.3 x 10 ⁻³ cm/hr. Most liquid alcohols appear to act as primary skin irritants in humans. Significant percutaneous absorption occurs in rabbits but not apparently in man.
Eye	If applied to the eyes, this material causes severe eye damage.
Chronic	Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course. N-propanol is shown to cause dose dependent severe liver injury, malignant tumours (blood and liver cancers) and benign tumours in rats. There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.

CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)	TOXICITY	IRRITATION
	TOXICITY	IRRITATION

CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)	No significant acute toxicological data identified in literature search. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
N-PROPANOL	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
WATER	No significant acute toxicological data identified in literature search.

Acute Toxicity	⊖	Carcinogenicity	⊖
Skin Irritation/Corrosion	⊖	Reproductivity	⊖
Serious Eye Damage/Irritation	✔	STOT - Single Exposure	✔
Respiratory or Skin sensitisation	⊖	STOT - Repeated Exposure	⊖
Mutagenicity	⊖	Aspiration Hazard	⊖

Legend: ✔ – Data required to make classification available
✘ – Data available but does not fill the criteria for classification
⊖ – Data Not Available to make classification

CMR STATUS

SKIN	n-propanol	US - Hawaii Air Contaminant Limits - Skin Designation US NIOSH Recommended Exposure Limits (RELs) - Skin US - Washington Permissible exposure limits of air contaminants - Skin US - California Permissible Exposure Limits for Chemical Contaminants - Skin	X[[skin]]S
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CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

For n-Propanol: log Kow: 0.25-0.34;
 Half-life (hr) air: 6.7;
 Half-life (hr) H₂O surface water: 6.5;
 Henry's atm m³/mol: 6.85E-06;
 BOD 5: 1.43-1.6 g O₂/g;
 BOD 20: <2 g O₂/g;
 COD : 91%;
 ThOD : 1.8 g;
 O₂/gBCF: 0.7.

Aquatic Fate: High biochemical oxygen demand and a potential to cause oxygen depletion in aqueous systems, a low potential to affect aquatic organisms, a low potential to affect secondary waste treatment microbial metabolism. n-Propanol is expected to biodegrade and is not expected to persist for long periods in aquatic environments. When diluted with a large amount of water, n-propanol is not expected to have a significant impact.

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
n-propanol	LOW	LOW
water	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
n-propanol	LOW (LogKOW = 0.25)
water	LOW (LogKOW = -1.38)

Mobility in soil

Ingredient	Mobility
n-propanol	HIGH (KOC = 1.325)
water	LOW (KOC = 14.3)


SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	Dispose of according to federal, state, and local regulations.

SECTION 14 TRANSPORT INFORMATION

Labels Required

	
Marine Pollutant	NO

Land transport (DOT)

UN number	3316
Packing group	II
UN proper shipping name	Chemical kits; First aid kits
Environmental hazard	No relevant data
Transport hazard class(es)	Class : 9
Special precautions for user	Special provisions : 15

Air transport (ICAO-IATA / DGR)

UN number	3316
Packing group	II
UN proper shipping name	Chemical kit †; First aid kit †
Environmental hazard	No relevant data
Transport hazard class(es)	ICAO/IATA Class : 9 ICAO / IATA Subrisk : Not Applicable ERG Code : 9L

CHEMets Ampoules for Filming Amines CHEMets Kit & Refill (R-1001) and for Detergents CHEMets Kit & Refill (R-9401)

Special precautions for user	Special provisions	A44 A163
	Cargo Only Packing Instructions	960
	Cargo Only Maximum Qty / Pack	10 kg
	Passenger and Cargo Packing Instructions	960
	Passenger and Cargo Maximum Qty / Pack	10 kg
	Passenger and Cargo Limited Quantity Packing Instructions	Y960
	Passenger and Cargo Limited Maximum Qty / Pack	1 kg

Sea transport (IMDG-Code / GGVSee)

UN number	3316	
Packing group	II	
UN proper shipping name	CHEMICAL KIT or FIRST AID KIT	
Environmental hazard	Not Applicable	
Transport hazard class(es)	IMDG Class	9
	IMDG Subrisk	Not Applicable
Special precautions for user	EMS Number	F-A , S-P
	Special provisions	251 340
	Limited Quantities	See SP251

Transport in bulk according to Annex II of MARPOL 73 / 78 and the IBC code

Source	Ingredient	Pollution Category
IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk	n-propanol	Y

SECTION 15 REGULATORY INFORMATION

Safety, health and environmental regulations / legislation specific for the substance or mixture

n-propanol(71-23-8) is found on the following regulatory lists	"US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Idaho - Limits for Air Contaminants", "US - Hawaii Air Contaminant Limits", "US - California Permissible Exposure Limits for Chemical Contaminants", "US ACGIH Threshold Limit Values (TLV) - Carcinogens", "US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Michigan Exposure Limits for Air Contaminants", "US NIOSH Recommended Exposure Limits (RELs)", "US - Alaska Limits for Air Contaminants", "US - Washington Permissible exposure limits of air contaminants", "US - Minnesota Permissible Exposure Limits (PELs)", "US ACGIH Threshold Limit Values (TLV)", "US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US OSHA Permissible Exposure Levels (PELs) - Table Z1"
water(7732-18-5) is found on the following regulatory lists	"US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

SECTION 16 OTHER INFORMATION

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

www.chemwatch.net/references

The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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DR300 Pocket Colorimeter

Applications

- Drinking Water
- Wastewater
- Power
- Industrial Water
- Field Use
- Beverage
- Food QC Lab



Proven past. Innovative future.

The DR300 maintains the Pocket Colorimeter legacy of reliability while providing state-of-the-art data transfer capability and connection to Claros*. Reduce data collection hassles, eliminate transcription errors, and ensure stronger compliance traceability.

Connected*

Optional Bluetooth connectivity allows you to safely transfer measurement data to Claros – Hach®'s Water Intelligence System – reducing errors and saving time by eliminating manual data entry.

Reliable

Rugged, waterproof (IP67) design withstands whatever conditions you encounter in the field (drops, extreme temperatures, rain and dirt) and still delivers years of dependable, accurate measurements.

Simple

Simple, intuitive operation reduces potential manual error, ensuring accurate measurement data you can trust, time after time. Larger display with improved backlight makes reading measurements in all conditions even easier.

**Claros connectivity currently available only in US, Canada and EU.*

Technical Data*

Source Lamp	Light emitting diode (LED)
Detector	Silicon photodiode
Enclosure Rating	IP67, waterproof at 1 m for 30 minutes
Wavelength	As specified by model, ± 2 nm
Spectral Bandwidth	15 nm filter bandwidth
Absorbance	0 - 2.5 Abs
Sample Cell Compatibility	1 cm (10 mL), 25 mm (10 mL)

Operating Conditions	0 - 50 °C (32 - 122 °F); 0 - 90% relative humidity (non-condensing)
Display	LCD with backlight
Power Supply	Four AAA alkaline batteries; approximate life is 5000 tests
Data Logger	Last 50 measurements
Weight	0.25 kg (0.55 lbs.)
Dimensions (H x W x D)	34 mm x 69 mm x 157 mm

*Subject to change without notice.

Parameters

Parameter	Range	Measurement Method
Aluminum	0.02 - 0.80 mg/L Al	Aluminon
Ammonia	0.01 - 0.80 mg/L NH ₃ -N	Salicylate
Bromine	0.05 - 4.50 mg/L Br ₂ 0.2 - 10.0 mg/L Br ₂	DPD
Chlorine, free ¹⁾ + total ^{1), 2)}	0.02 - 2.00 mg/L Cl ₂ 0.1 - 8.0 mg/L Cl ₂	DPD
Chlorine, free ¹⁾ + total ^{1), 2)} , MR	0.05 - 4.00 mg/L Cl ₂ 0.1 - 10.0 mg/L Cl ₂	DPD
Chlorine, pH	0.1 - 10.0 mg/L Cl ₂ 6.0 - 8.5 pH	DPD Phenol Red
Chlorine dioxide	0.05 - 5.00 mg/L ClO ₂	DPD/Glycine
Iron, Ferrover ²⁾	0.02 - 5.00 mg/L Fe	Ferrover
Iron, TPTZ	0.01 - 1.70 mg/L Fe	TPTZ
Manganese, HR ²⁾	0.2-20.0 mg/L Mn	Periodate Oxidation
Molybdenum	0.02 - 3.00 mg/L Mo 0.1 - 12.0 mg/L Mo	Ternary Complex
Monochlor/Free Ammonia	0.04 - 4.50 mg/L Monochloramine as Cl ₂ 0.02 - 0.50 mg/L Free Ammonia as NH ₃ -N	Indophenol
Nitrate	0.4 - 30.0 mg/L NO ₃ -N	Cadmium Reduction
Oxygen, dissolved	0.2 - 10.0 mg/L O ₂	HRDO
Ozone	0.01 - 0.25 mg/L O ₃ 0.01 - 0.75 mg/L O ₃	Indigo Trisulfonate
Phosphate ^{1), 2)}	0.02 - 3.00 mg/L PO ₄	Phosver 3
Zinc ²⁾	0.02 - 3.00 mg/L Zn	Zincon

¹⁾Method is USEPA accepted or approved for drinking water (additional steps may be required)

²⁾Method is USEPA accepted or approved for wastewater (additional steps may be required)

Note: Phenol Red colorimetric pH measurement is not accepted for regulatory reporting

Order Information

DR300 Pocket Colorimeters

The DR300 Pocket Colorimeter includes manual, sample cells, and a carrying case. Reagents can be purchased by contacting Hach or your Hach distributor.

LPV445.97.00110	DR300 Pocket Colorimeter, Chlorine, Free + Total
LPV445.97.01110	DR300 Pocket Colorimeter, Bromine
LPV445.97.02110	DR300 Pocket Colorimeter, Nitrate
LPV445.97.03110	DR300 Pocket Colorimeter, Dissolved Oxygen
LPV445.97.04110	DR300 Pocket Colorimeter, Ozone
LPV445.97.06110	DR300 Pocket Colorimeter, Phosphate
LPV445.97.09110	DR300 Pocket Colorimeter, Zinc
LPV445.97.10110	DR300 Pocket Colorimeter, Molybdenum, LR/HR
LPV445.97.12110	DR300 Pocket Colorimeter, Chlorine & pH
LPV445.97.15110	DR300 Pocket Colorimeter, Manganese, HR
LPV445.97.16110	DR300 Pocket Colorimeter, Iron, TPTZ
LPV445.97.22110	DR300 Pocket Colorimeter, Iron, Ferrower
LPV445.97.25110	DR300 Pocket Colorimeter, Aluminium
LPV445.97.26110	DR300 Pocket Colorimeter, Monochloramine/Free Ammonium
LPV445.97.40110	DR300 Pocket Colorimeter, Ammonium
LPV445.97.51110	DR300 Pocket Colorimeter, Chlorine Dioxide
LPV445.97.62110	DR300 Pocket Colorimeter, Chlorine, Free + Total, MR

Wavelength-specific DR300 Pocket Colorimeters

Program custom methods and calibrations on two channels.

LPV445.97.50110	DR300 Pocket Colorimeter, 500 nm
LPV445.97.52110	DR300 Pocket Colorimeter, 528 nm
LPV445.97.60110	DR300 Pocket Colorimeter, 600 nm
LPV445.97.65110	DR300 Pocket Colorimeter, 655 nm



Order Information

Accessories

2635300	SpecCheck secondary gel standard kit, LR Chlorine, DPD, 0-2.0 mg/L Cl ₂
2893300	SpecCheck secondary gel standard kit, Chlorine, DPD, 0-8.0 mg/L Cl ₂
2507500	SpecCheck secondary gel standard kit, Monochloramine/Free Ammonia, 0-4.50 mg/L Cl ₂ , 0-0.50 mg/L NH ₃ -N
2708000	SpecCheck secondary gel standard kit, Ozone, 0-0.75 mg/L O ₃
4674300	Batteries, AAA, Alkaline, 1.5 V, pk/4
4660200	Multitest kit case (22 x 17 x 15 cm), blue polypropylene
2427606	Sample cell, 1 inch round glass, 6 pcs
4864302	Sample cell, 1 inch round polystyrene, 2 pcs
2126102	Sample cell, 1cm round, pk/2 (unmatched, caps not included)

SpecCheck Ampule Standards are colored gels that simulate the color produced by the analytical procedure, for simple checks on instrument response. Each set includes a blank and three concentrations.

Be confident with Hach Service

Service Agreement: Hach provides on-site and in-factory repair, preventive maintenance, and calibration programs for your instruments to ensure reliability and instrument up-time. We have services to fit your specific needs.

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hach.com

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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.



Be Right™



Be Right™

SAFETY DATA SHEET

Issue Date 12-Apr-2019

Revision Date
31-Dec-2019

Version 6.3

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1. IDENTIFICATION

Product identifier

Product Name Ammonia Cyanurate

Other means of identification

Product Code(s) 2653199

Safety data sheet number M00128

UN/ID no UN2680

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory Use. Reagent for ammonia test.

Uses advised against Consumer use.

Restrictions on use For Laboratory Use Only.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1
Chronic aquatic toxicity	Category 3

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word

Danger



Hazard statements

H314 - Causes severe skin burns and eye damage
H412 - Harmful to aquatic life with long lasting effects

Precautionary statements

P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/physician
P363 - Wash contaminated clothing before reuse
P405 - Store locked up
P501 - Dispose of contents/ container to an approved waste disposal plant
P273 - Avoid release to the environment

Other Hazards Known

May be harmful if swallowed
Harmful to aquatic life

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Chemical Family Mixture.
Chemical nature Mixture of inorganic salts.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Lithium hydroxide monohydrate	1310-66-3	1 - 5%	-
Dichloroisocyanuric acid, sodium salt	2893-78-9	1 - 5%	-

4. FIRST AID MEASURES

Description of first aid measures

General advice Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Inhalation Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical

advice/attention.

Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical advice/attention.
Ingestion	Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Get immediate medical advice/attention.
Self-protection of the first aider	Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable Extinguishing Media	Caution: Use of water spray when fighting fire may be inefficient.
Specific hazards arising from the chemical	The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors.
Hazardous combustion products	May emit toxic and corrosive fumes.
Special protective equipment for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Attention! Corrosive material. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Store locked up. Keep out of the reach of children. Store away from other materials.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies

Appropriate engineering controls

Engineering Controls Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves.

Eye/face protection Face protection shield.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

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General Hygiene Considerations Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Solid	Color	white
Appearance	powder	Odor threshold	No data available
Odor	Chlorine		

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Molecular weight	Not applicable	
pH	12.33	5% Solution
Melting point/freezing point	> 240 °C / 464 °F	
Boiling point / boiling range	No data available	
Evaporation rate	Not applicable	
Vapor pressure	Not applicable	
Vapor density (air = 1)	Not applicable	
Specific gravity (water = 1 / air = 1)	1.783	
Partition Coefficient (n-octanol/water)	No data available	
Soil Organic Carbon-Water Partition Coefficient	No data available	
Autoignition temperature	No data available	
Decomposition temperature	No data available	
Dynamic viscosity	Not applicable	
Kinematic viscosity	Not applicable	

Solubility(ies)

Water solubility

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

<u>Chemical Name</u>	<u>Solubility classification</u>	<u>Solubility</u>	<u>Solubility Temperature</u>
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

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Other Information

Metal Corrosivity

Classified as corrosive to metal according to GHS criteria

Steel Corrosion Rate

Not applicable

Aluminum Corrosion Rate

Not applicable

Volatile Organic Compounds (VOC) Content

Not applicable

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Lithium hydroxide monohydrate	1310-66-3	No data available	-
Dichloroisocyanuric acid, sodium salt	2893-78-9	No data available	-

Explosive properties

Upper explosion limit

No data available

Lower explosion limit

No data available

Flammable properties

Flash point

Not applicable

Flammability Limit in Air

Upper flammability limit

No data available

Lower flammability limit

No data available

Oxidizing properties

No data available.

Bulk density

No data available

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

None under normal processing.

Hazardous polymerization

Hazardous polymerization does not occur.

Conditions to avoid

Exposure to air or moisture over prolonged periods.

Incompatible materials

Acids. Bases. Oxidizing agent.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation	Corrosive by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal.
Eye contact	Causes burns. Corrosive to the eyes and may cause severe damage including blindness. Causes serious eye damage. May cause irreversible damage to eyes.
Skin contact	Corrosive. Causes severe burns. Avoid contact with skin and clothing.
Ingestion	Causes burns. Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways.

Symptoms Redness. Burning. May cause blindness. Coughing and/ or wheezing.

Acute toxicity

Based on available data, the classification criteria are not met

Product Acute Toxicity Data

Test data reported below.

Oral Exposure Route

<u>Endpoint type</u>	<u>Reported dose</u>	<u>Exposure time</u>	<u>Toxicological effects</u>	<u>Key literature references and sources for data</u>
Rat LD ₅₀	3613 mg/kg	None reported	None reported	Outside testing

Inhalation (Gas) Exposure Route

Ingredient Acute Toxicity Data

Test data reported below.

Oral Exposure Route

<u>Chemical name</u>	<u>Endpoint type</u>	<u>Reported dose</u>	<u>Exposure time</u>	<u>Toxicological effects</u>	<u>Key literature references and sources for data</u>
Lithium hydroxide monohydrate (1 - 5%) CAS#: 1310-66-3	Rat LD ₅₀	225 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)
Dichloroisocyanuric acid, sodium salt (1 - 5%) CAS#: 2893-78-9	Rat LD ₅₀	750 mg/kg	None reported	None reported	ERMA (New Zealand's Environmental Risk Management Authority) HSDB (Hazardous Substances Data Bank)

Dermal Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Dichloroisocyanuric acid, sodium salt (1 - 5%) CAS#: 2893-78-9	Rabbit LD ₅₀	> 10000 mg/kg	None reported	None reported	No information available

Inhalation (Dust/Mist) Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Lithium hydroxide monohydrate (1 - 5%) CAS#: 1310-66-3	Rat LC ₅₀	0.96 mg/L	4 hours	None reported	IUCLID (The International Uniform Chemical Information Database)
Dichloroisocyanuric acid, sodium salt (1 - 5%) CAS#: 2893-78-9	Rat LC ₅₀	1.17 mg/L	4 hours	None reported	IUCLID (The International Uniform Chemical Information Database)

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	No information available
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	26.66 mg/L
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Skin corrosion/irritation

Causes severe burns.

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

Test data reported below.

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Lithium hydroxide monohydrate (1 - 5%) CAS#: 1310-66-3	Existing human experience	Human	None reported	None reported	Corrosive to skin	ERMA (New Zealand's Environmental Risk Management Authority)
Dichloroisocyanuric acid, sodium salt (1 - 5%) CAS#: 2893-78-9	Existing human experience	Human	None reported	None reported	Skin irritant	HSDB (Hazardous Substances Data Bank)

Serious eye damage/irritation

Classification based on data available for ingredients. Causes burns. Risk of serious damage to eyes.

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

Test data reported below.

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Dichloroisocyanuric acid, sodium salt (1 - 5%) CAS#: 2893-78-9	Existing human experience	Human	None reported	None reported	Corrosive to eyes	HSDB (Hazardous Substances Data Bank)

Respiratory or skin sensitization

Based on available data, the classification criteria are not met.

Product Sensitization Data

No data available.

Ingredient Sensitization Data

No data available.

STOT - single exposure

Based on available data, the classification criteria are not met.

Product Specific Target Organ Toxicity Single Exposure Data

No data available.

Ingredient Specific Target Organ Toxicity Single Exposure Data

No data available.

STOT - repeated exposure

Based on available data, the classification criteria are not met.

Product Specific Target Organ Toxicity Repeat Dose Data

No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

No data available.

Carcinogenicity

Based on available data, the classification criteria are not met.

Product Carcinogenicity Data

No data available.

Ingredient Carcinogenicity Data

No data available.

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Lithium hydroxide monohydrate	1310-66-3	-	-	-	-
Dichloroisocyanuric acid, sodium salt	2893-78-9	-	-	-	-

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply

OSHA (Occupational Safety and Health Administration of the US Department of Labor)	Does not apply
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Germ cell mutagenicity

Based on available data, the classification criteria are not met.

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

No data available.

Product Germ Cell Mutagenicity invivo Data

No data available.

Ingredient Germ Cell Mutagenicity invivo Data

No data available.

Reproductive toxicity

Based on available data, the classification criteria are not met.

Product Reproductive Toxicity Data

No data available.

Ingredient Reproductive Toxicity Data

Test data reported below.

Oral Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Dichloroisocyanuric acid, sodium salt (1 - 5%) CAS#: 2893-78-9	Mouse TD _{Lo}	4000 mg/kg	9 days	Effects on Newborn Growth statistics (e.g. % reduced weight gain) Physical Specific Developmental Abnormalities Musculoskeletal system	RTECS (Registry of Toxic Effects of Chemical Substances)

Aspiration hazard

Based on available data, the classification criteria are not met.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Harmful to aquatic life with long lasting effects.

Unknown aquatic toxicity

0% of the mixture consists of components(s) of unknown hazards to the aquatic environment.

Product Ecological Data

Aquatic Acute Toxicity

No data available.

Aquatic Chronic Toxicity

No data available.

Ingredient Ecological Data

Aquatic Acute Toxicity

Test data reported below.

Fish

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Dichloroisocyanuric acid, sodium salt (1 - 5%) CAS#: 2893-78-9	96 hours	<i>Oncorhynchus mykiss</i>	LC ₅₀	0.25 mg/L	PEEN (Pan European Ecological Network)

Crustacea

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Dichloroisocyanuric acid, sodium salt (1 - 5%) CAS#: 2893-78-9	48 Hours	<i>Daphnia magna</i>	LC ₅₀	0.28 mg/L	ECHA (The European Chemicals Agency) PEEN (Pan European Ecological Network)

Aquatic Chronic Toxicity

No data available.

Persistence and degradability

Product Biodegradability Data

No data available.

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water)

No data available

Mobility

Soil Organic Carbon-Water Partition Coefficient

No data available

Other adverse effects

Contains a substance with an endocrine-disrupting potential.

Chemical name	EU - Endocrine Disruptors Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Endocrine disrupting potential
Dichloroisocyanuric acid, sodium salt (1 - 5%) CAS#: 2893-78-9	Group III Chemical	-	-

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products

Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging

Do not reuse empty containers.

US EPA Waste Number

D002

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Special instructions for disposal Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Open cold water tap completely, slowly pour the reacted material to the drain. Flush system with plenty of water.

14. TRANSPORT INFORMATION

DOT

UN/ID no	UN2680
Proper shipping name	Lithium Hydroxide
Hazard Class	8
Packing Group	II
Emergency Response Guide Number	154

TDG

UN/ID no	UN2680
Proper shipping name	Lithium hydroxide
TDG Technical Name	Dichloroisocyanuric acid, sodium salt
Hazard Class	8
Packing Group	II
Description	UN2680, Lithium hydroxide, 8, II

IATA

UN/ID no	UN2680
Proper shipping name	Lithium hydroxide
Hazard Class	8
Packing Group	II
ERG Code	8L

IMDG

UN/ID no	UN2680
Proper shipping name	Lithium hydroxide
Hazard Class	8
Packing Group	II
EmS-No	F-A, S-B

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA	Complies
DSL/NDSL	Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS	Does not comply
ENCS	Complies
IECSC	Complies
KECL	Complies
PICCS	Complies

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TCSI Complies
AICS Complies
NZIoC Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
TCSI - Taiwan Chemical Substances Inventory
AICS - Australian Inventory of Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

IMERC: Not applicable

U.S. State Right-to-Know Regulations

This product may contain substances regulated by state right-to-know regulations.

Chemical name	New Jersey	Massachusetts	Pennsylvania
Lithium hydroxide monohydrate 1310-66-3	X	-	-
Dichloroisocyanuric acid, sodium salt 2893-78-9	X	X	X

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Dichloroisocyanuric acid, sodium salt	180.0940	-

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Chemical name	Global Automotive Declarable Substance List Classifications	Global Automotive Declarable Substance List Thersholds
Dichloroisocyanuric acid, sodium salt 2893-78-9	Declarable Substance (LR) Prohibited Substance (LR)	0 %

NFPA and HMIS Classifications

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and chemical properties -
HMIS	Health hazards - 3	Flammability - 0	Physical hazards - 0	Personal protection - X

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH *Immediately Dangerous to Life or Health*
 ACGIH ACGIH (American Conference of Governmental Industrial Hygienists)
 NDF *no data*

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
MAC	Maximum Allowable Concentration	Ceiling	Ceiling Limit Value
X	Listed	Vacated	These values have no official status. The only binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.
SKN*	Skin designation	SKN+	Skin sensitization
RSP+	Respiratory sensitization	**	Hazard Designation
C	Carcinogen	R	Reproductive toxicant
M	mutagen		

Prepared By Hach Product Compliance Department

Issue Date 12-Apr-2019

Revision Date 31-Dec-2019

Revision Note SDS sections updated
2

Disclaimer

Product Code(s) 2653199
Issue Date 12-Apr-2019
Version 6.3

Product Name Ammonia Cyanurate
Revision Date 31-Dec-2019
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USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY©2019

End of Safety Data Sheet



Be Right™

SAFETY DATA SHEET

Issue Date 31-12-2019

Revision Date
05-Aug-2020

Version 3.5

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1. IDENTIFICATION

Product identifier

Product Name Ammonia Salicylate Reagent

Other means of identification

Product Code(s) 2653299

Safety data sheet number M00127

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory Use. Reagent for ammonia test.

Uses advised against None.

Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word

Danger

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Hazard statements

H302 - Harmful if swallowed
H315 - Causes skin irritation
H318 - Causes serious eye damage
H335 - May cause respiratory irritation

Precautionary statements

P270 - Do not eat, drink or smoke when using this product
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P330 - Rinse mouth
P501 - Dispose of contents/ container to an approved waste disposal plant
P280 - Wear protective gloves, protective clothing, eye protection, and face protection
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P332 + P313 - If skin irritation occurs: Get medical attention
P362 - Take off contaminated clothing and wash before reuse
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/physician
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P271 - Use only outdoors or in a well-ventilated area
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up

Other Hazards Known

None

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Chemical Family Mixture.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Sodium salicylate	54-21-7	40 - 50%	-
Sodium tartrate dihydrate	6106-24-7	7 - 13%	-
Ferrate(2-), pentakis(cyano-C)nitrosyl-, disodium, dihydrate, (OC-6-22)-	13755-38-9	<1%	-
m-Nitrophenol	554-84-7	<1%	-

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

Inhalation	Remove to fresh air. Get medical attention immediately if symptoms occur. IF exposed or concerned: Get medical advice/attention.
Eye contact	Get immediate medical advice/attention. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open while rinsing. Do not rub affected area.
Skin contact	Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical attention if irritation develops and persists.
Ingestion	Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Call a physician.
Self-protection of the first aider	Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable Extinguishing Media	Caution: Use of water spray when fighting fire may be inefficient.
Specific hazards arising from the chemical	No information available.
Hazardous combustion products	May emit acrid smoke and fumes.
Special protective equipment for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Ensure adequate ventilation. Evacuate personnel to safe areas.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up

Methods for containment	Prevent further leakage or spillage if safe to do so.
Methods for cleaning up	Pick up and transfer to properly labeled containers.
Prevention of secondary hazards	Clean contaminated objects and areas thoroughly observing environmental regulations.
Reference to other sections	See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. Ensure adequate ventilation. Avoid breathing vapors or mists. In case of insufficient ventilation, wear suitable respiratory equipment.

Conditions for safe storage, including any incompatibilities

Storage Conditions	Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children. Store locked up.
Flammability class	Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
Ferrate(2-), pentakis(cyano-C)nitrosyl-, disodium, dihydrate, (OC-6-22)- CAS#: 13755-38-9	TWA: 1 mg/m ³ Fe	TWA: 5 mg/m ³ (vacated) TWA: 1 mg/m ³ (vacated) TWA: 5 mg/m ³ *	IDLH: 25 mg/m ³ CN TWA: 1 mg/m ³ Fe

Appropriate engineering controls

Engineering Controls Showers
 Eyewash stations
 Ventilation systems.

Individual protection measures, such as personal protective equipment

Respiratory protection	No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.
Hand Protection	Wear suitable gloves. Impervious gloves.
Eye/face protection	Tight sealing safety goggles.
Skin and body protection	Wear suitable protective clothing. Long sleeved clothing.
General Hygiene Considerations	Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product.

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Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Solid
Appearance powder
Color Tan
Odor Odorless
Odor threshold No data available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Molecular weight	No data available	
pH	7.84	5% Solution
Melting point/freezing point	97 °C / 207 °F	
Boiling point / boiling range	No data available	
Evaporation rate	Not applicable	
Vapor pressure	Not applicable	
Vapor density (air = 1)	Not applicable	
Specific gravity (water = 1 / air = 1)	1.689	
Partition Coefficient (n-octanol/water)	log K _{ow} ~ -0.6	
Soil Organic Carbon-Water Partition Coefficient	log K _{oc} ~ -0.84	
Autoignition temperature	No data available	
Decomposition temperature	No data available	
Dynamic viscosity	Not applicable	
Kinematic viscosity	Not applicable	

Solubility(ies)

Water solubility

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

<u>Chemical Name</u>	<u>Solubility classification</u>	<u>Solubility</u>	<u>Solubility Temperature</u>
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other Information

Metal Corrosivity

Steel Corrosion Rate Not applicable
Aluminum Corrosion Rate Not applicable

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Volatile Organic Compounds (VOC) Content

Not applicable

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Sodium salicylate	54-21-7	No data available	-
Sodium tartrate dihydrate	6106-24-7	No data available	-
Ferrate(2-), pentakis(cyano-C)nitrosyl-, disodium, dihydrate, (OC-6-22)-	13755-38-9	No data available	-
m-Nitrophenol	554-84-7	No data available	-

Explosive properties

Upper explosion limit No data available
Lower explosion limit No data available

Flammable properties

Flash point Not applicable

Flammability Limit in Air

Upper flammability limit No data available
Lower flammability limit No data available

Oxidizing properties

No data available.

Bulk density

No data available

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None.
Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

None under normal processing.

Hazardous polymerization

None under normal processing.

Conditions to avoid

None known based on information supplied.

Incompatible materials

Strong acids. Strong bases. Strong oxidizing agents.

Hazardous Decomposition Products

Cyanide. Nitrogen oxides. Sodium oxides.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation	May cause irritation of respiratory tract.
Eye contact	Severely irritating to eyes. Causes serious eye damage. May cause burns. May cause irreversible damage to eyes.
Skin contact	Causes skin irritation.
Ingestion	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Harmful if swallowed.

Symptoms Redness. Burning. May cause blindness. May cause redness and tearing of the eyes.

Acute toxicity

Based on available data, the classification criteria are not met

Product Acute Toxicity Data

No data available.

Ingredient Acute Toxicity Data

No data available.

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium salicylate (40 - 50%) CAS#: 54-21-7	Rat LD ₅₀	930 mg/kg	None reported	Behavioral Convulsions or effect on seizure threshold Muscle contraction or spasticity	RTECS (Registry of Toxic Effects of Chemical Substances)
Sodium tartrate dihydrate (7 - 13%) CAS#: 6106-24-7	Mouse LD ₅₀	4360 mg/kg	None reported	None reported	EPA (United States Environmental Protection Agency)
Ferrate(2-), pentakis(cyano-C)nitr osyl-, disodium, dihydrate, (OC-6-22)- (<1%) CAS#: 13755-38-9	Rat LD ₅₀	99 mg/kg	None reported	None reported	LOLI
m-Nitrophenol (<1%) CAS#: 554-84-7	Rat LD ₅₀	328 mg/kg	None reported	None reported	Vendor SDS

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	1,666.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

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Skin corrosion/irritation

Classification based on data available for ingredients. Irritating to skin.

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

No data available.

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium salicylate (40 - 50%) CAS#: 54-21-7	OECD Test 404: Acute Dermal Corrosion/Irritation	Rabbit	500 mg	4 hours	Not corrosive or irritating to skin	ECHA (The European Chemicals Agency)
m-Nitrophenol (<1%) CAS#: 554-84-7	Standard Draize Test	Rabbit	20 mg	24 hours	Skin irritant	RTECS (Registry of Toxic Effects of Chemical Substances)

Serious eye damage/irritation

Classification based on data available for ingredients. Causes burns. Risk of serious damage to eyes.

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

No data available.

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium salicylate (40 - 50%) CAS#: 54-21-7	OECD Test 439: In Vitro Skin Irritation: Reconstructed Human Epidermis (Rhe) Test Method	Human	50 mg	6 hours	Eye irritant	ECHA (The European Chemicals Agency)
Sodium tartrate dihydrate (7 - 13%) CAS#: 6106-24-7	None reported	Human	None reported	None reported	Not corrosive or irritating to eyes	ECHA (The European Chemicals Agency)
m-Nitrophenol (<1%) CAS#: 554-84-7	Standard Draize Test	Rabbit	5 mg	24 hours	Corrosive to eyes	RTECS (Registry of Toxic Effects of Chemical Substances)

Respiratory or skin sensitization

Based on available data, the classification criteria are not met.

Product Sensitization Data

No data available.

Ingredient Sensitization Data

No data available.

Chemical name	Test method	Species	Results	Key literature references and sources for data
Sodium salicylate (40 - 50%) CAS#: 54-21-7	Based on human experience	Human	Not confirmed to be a skin sensitizer	Vendor SDS
Sodium tartrate dihydrate (7 - 13%)	None reported	Human	Not confirmed to be a skin sensitizer	ECHA (The European Chemicals Agency)

CAS#: 6106-24-7				
Chemical name	Test method	Species	Results	Key literature references and sources for data
Sodium salicylate (40 - 50%) CAS#: 54-21-7	Based on human experience	Human	Not confirmed to be a respiratory sensitizer	Vendor SDS
Sodium tartrate dihydrate (7 - 13%) CAS#: 6106-24-7	None reported	Human	Not confirmed to be a skin sensitizer	ECHA (The European Chemicals Agency)

STOT - single exposure

May cause respiratory irritation.

Product Specific Target Organ Toxicity Single Exposure Data

No data available.

Ingredient Specific Target Organ Toxicity Single Exposure Data

No data available.

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium salicylate (40 - 50%) CAS#: 54-21-7	Human LD _{Lo}	700 mg/kg	None reported	Lungs, Thorax, or Respiration Dyspnea	RTECS (Registry of Toxic Effects of Chemical Substances)

STOT - repeated exposure

Based on available data, the classification criteria are not met.

Product Specific Target Organ Toxicity Repeat Dose Data

No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

No data available.

Carcinogenicity

Based on available data, the classification criteria are not met.

Product Carcinogenicity Data

No data available.

Ingredient Carcinogenicity Data

No data available.

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Sodium salicylate	54-21-7	-	-	-	-
Sodium tartrate dihydrate	6106-24-7	-	-	-	-
Ferrate(2-), pentakis(cyano-C)nitrosyl-, disodium, dihydrate, (OC-6-22)-	13755-38-9	-	-	-	-
m-Nitrophenol	554-84-7	-	-	-	-

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of Labor)	Does not apply

Germ cell mutagenicity

EN / AGHS	Page 9 / 15
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Based on available data, the classification criteria are not met.

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

No data available.

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium salicylate (40 - 50%) CAS#: 54-21-7	OECD 471	<i>Salmonella typhimurium</i>	0.158 mg/plate	48 hours	Negative test result for mutagenicity	No information available
m-Nitrophenol (<1%) CAS#: 554-84-7	Mutation in microorganisms	<i>Salmonella typhimurium</i>	1 mg/plate	None reported	Positive test result for mutagenicity	CCRIS (Chemical Carcinogenesis Research Information System)

Product Germ Cell Mutagenicity invivo Data

No data available.

Ingredient Germ Cell Mutagenicity invivo Data

No data available.

Chemical name	Test	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sodium salicylate (40 - 50%) CAS#: 54-21-7	DNA damage	Rat	30 mg/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

Reproductive toxicity

Based on available data, the classification criteria are not met.

Product Reproductive Toxicity Data

No data available.

Ingredient Reproductive Toxicity Data

No data available.

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sodium salicylate (40 - 50%) CAS#: 54-21-7	Rat TD _{Lo}	40 mg/kg	1 days	Effects on Newborn Stillbirth	RTECS (Registry of Toxic Effects of Chemical Substances)

Aspiration hazard

Based on available data, the classification criteria are not met.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Unknown aquatic toxicity

0% of the mixture consists of components(s) of unknown hazards to the aquatic environment.

Product Ecological Data

Aquatic Acute Toxicity

No data available.

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Aquatic Chronic Toxicity

No data available.

Ingredient Ecological Data

Aquatic Acute Toxicity

No data available.

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sodium salicylate (40 - 50%) CAS#: 54-21-7	96 hours	<i>Pimephales promelas</i>	LC ₅₀	1370 mg/L	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Sodium tartrate dihydrate (7 - 13%) CAS#: 6106-24-7	96 hours	None reported	LC ₅₀	612000 mg/L	Estimation through ECOSARS v1.11 part of the Estimation Programs Interface (EPI) Suite™
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sodium tartrate dihydrate (7 - 13%) CAS#: 6106-24-7	48 Hours	None reported	LC ₅₀	263000 mg/L	Estimation through ECOSARS v1.11 part of the Estimation Programs Interface (EPI) Suite™
Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sodium tartrate dihydrate (7 - 13%) CAS#: 6106-24-7	96 hours	None reported	EC ₅₀	623770 mg/L	Estimation through ECOSARS v1.11 part of the Estimation Programs Interface (EPI) Suite™

Aquatic Chronic Toxicity

No data available.

Persistence and degradability

Product Biodegradability Data

No data available.

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water)

log K_{ow} ~ -0.6

Mobility

Soil Organic Carbon-Water Partition Coefficient

log K_{oc} ~ -0.84

Other adverse effects

Contains a substance with an endocrine-disrupting potential.

Chemical name	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Endocrine disrupting potential
Ferrate(2-), pentakis(cyano-C)nitrosyl-, disodium, dihydrate, (OC-6-22)- (<1%) CAS#: 13755-38-9	Group III Chemical	-	-

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

Special instructions for disposal Dilute to 3 to 5 times the volume with cold water. Flush system with plenty of water. If permitted by regulation. Open cold water tap completely, slowly pour the material to the drain. Check with national, local municipal and state authorities and waste contractors for pertinent local information on the disposal of this article.

14. TRANSPORT INFORMATION

DOT Not regulated

TDG Not regulated

IATA Not regulated

IMDG Not regulated

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA Complies
DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Does not comply
ENCS Complies
IECSC Complies
Existing substances Complies
PICCS Complies
TCSI Complies
AICS Complies
NZIoC Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

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TCSI - Taiwan Chemical Substances Inventory
AICS - Australian Inventory of Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	SARA 313 - Threshold Values %
Ferrate(2-), pentakis(cyano-C)nitrosyl-, disodium, dihydrate, (OC-6-22)- (CAS #: 13755-38-9)	1.0

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Ferrate(2-), pentakis(cyano-C)nitrosyl-, disodium, dihydrate, (OC-6-22)- 13755-38-9	-	X	X	-
m-Nitrophenol 554-84-7	-	-	-	X

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
m-Nitrophenol 554-84-7	100 lb	-	RQ 100 lb final RQ RQ 45.4 kg final RQ

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

This product does not contain any substances regulated by state right-to-know regulations.

Chemical name	New Jersey	Massachusetts	Pennsylvania
Ferrate(2-), pentakis(cyano-C)nitrosyl-, disodium, dihydrate, (OC-6-22)- 13755-38-9	X	-	X
m-Nitrophenol 554-84-7	X	X	X

U.S. EPA Label Information

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and chemical properties -
HMIS	Health hazards - 3	Flammability - 0	Physical hazards - 0	Personal protection - X

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH *Immediately Dangerous to Life or Health*
 ACGIH ACGIH (American Conference of Governmental Industrial Hygienists)
 NDF *no data*

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
MAC	Maximum Allowable Concentration	Ceiling	Ceiling Limit Value
X	Listed	Vacated	These values have no official status. The only binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.
SKN*	Skin designation	SKN+	Skin sensitization
RSP+	Respiratory sensitization	**	Hazard Designation
C	Carcinogen	R	Reproductive toxicant
M	mutagen		

Prepared By Hach Product Compliance Department

Issue Date 31-12-2019

Revision Date 05-Aug-2020

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY©2019

Product Code(s) 2653299
Issue Date 31-12-2019
Version 3.5

Product Name Ammonia Salicylate Reagent
Revision Date 05-Aug-2020
Page 15 / 15

End of Safety Data Sheet

Salicylate Method¹

Method 8155

0.01 to 0.80 mg/L NH₃-N

Powder Pillows

Scope and application: For water, wastewater and seawater.

¹ Adapted from Clin. Chim. Acta., 14, 403 (1966).



Test preparation

Before starting

The reagents that are used in this test contain sodium nitroferricyanide. **Keep cyanide solutions at pH > 11 to prevent exposure to hydrogen cyanide gas.** Collect the reacted samples for safe disposal.

Keep the samples sealed at all times to prevent ammonia contamination from the air.

Always do tests in sample cells. Do not put the instrument in the sample or pour the sample into the cell holder.

Make sure that the sample cells are clean and there are no scratches where the light passes through them.

Rinse the sample cell and cap with the sample three times before the sample cell is filled.

Make sure that there are no fingerprints or liquid on the external surface of the sample cells. Wipe with a lint-free cloth before measurement.

Cold waters can cause condensation on the sample cell or bubbles in the sample cell during color development. Examine the sample cell for condensation or bubbles. Remove condensation with a lint-free cloth. Invert the sample cell to remove bubbles.

Install the instrument cap over the cell holder before ZERO or READ is pushed.

After the test, immediately empty and rinse the sample cell. Rinse the sample cell and cap three times with deionized water.

If the test result is over-range, dilute the sample with high quality, ammonia-free deionized water and repeat the test. Multiply the result by the dilution factor. Refer to [Sample dilution](#) on page 2.

Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

Dispose of reacted solutions according to local, state and federal regulations. Refer to the Safety Data Sheets for disposal information for unused reagents. Refer to the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.

Items to collect

Description	Quantity
Ammonia Cyanurate Reagent Powder Pillow, 10-mL	2
Ammonia Salicylate Reagent Powder Pillow, 10-mL	2
Sample cells, 25-mm (10 mL)	2

Refer to [Consumables and replacement items](#) on page 6 for order information.

Sample collection and storage

- Collect samples in clean glass or plastic bottles.
- If the sample contains chlorine, add 1 drop of 0.1 N sodium thiosulfate to 1 liter of sample to remove each 0.3 mg/L of chlorine.
- To preserve samples for later analysis, adjust the sample pH to less than 2 with concentrated sulfuric acid (approximately 2 mL per liter). No acid addition is necessary if the sample is tested immediately.
- Keep the preserved samples at or below 6 °C (43 °F) for a maximum of 28 days.
- Let the sample temperature increase to room temperature before analysis.
- Before analysis, adjust the pH to 7 with 5 N sodium hydroxide solution.
- Correct the test result for the dilution caused by the volume additions.

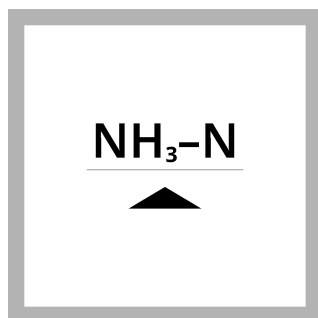
Sample dilution

Select the applicable sample volume from [Table 1](#). The sample volume depends on the starting concentration of the sample. Put the sample in a graduated mixing cylinder, then dilute the sample to 25 mL with deionized water and mix fully.

Table 1 Sample volumes for dilution

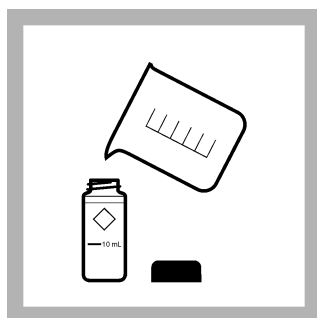
Starting concentration (mg/L NH ₃ -N)	Sample volume (mL)	Dilution factor
≤ 0.8	Dilution is not necessary.	—
≤ 2	10.0 mL	2.5
≤ 4	5.0 mL	5.0
≤ 8	2.5 mL	10.0
≤ 20	1.0 mL	25.0

Powder pillow procedure

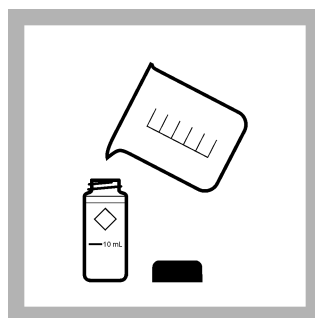


1. Set the instrument to NH₃-N.

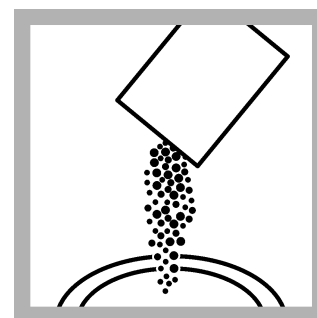
For DR300, push the up arrow button. For PCII, push the menu button, checkmark button, then the menu button again.



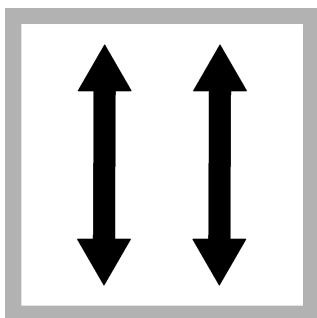
2. **Prepare the blank:** Fill a sample cell to the 10-mL mark with deionized water.



3. **Prepare the sample:** Fill a sample cell to the 10-mL mark with sample or diluted sample. Refer to [Sample dilution](#) on page 2.



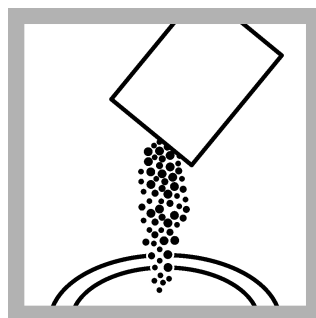
4. Add the contents of one Ammonia Salicylate Powder Pillow to each sample cell.



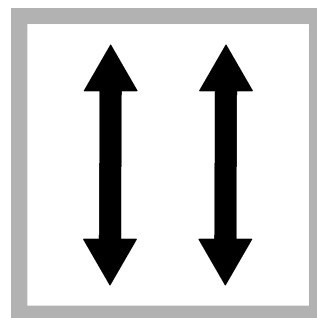
5. Put the stopper on the sample cell. Shake to dissolve the reagent.



6. Set and start a timer for 3 minutes. A 3-minute reaction time starts.



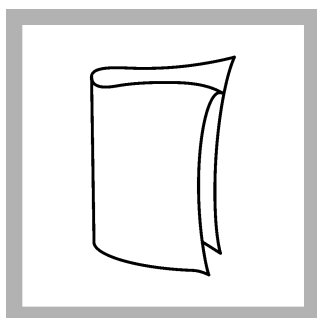
7. After the timer expires, add the contents of one Ammonia Cyanurate Powder Pillow to each sample cell.



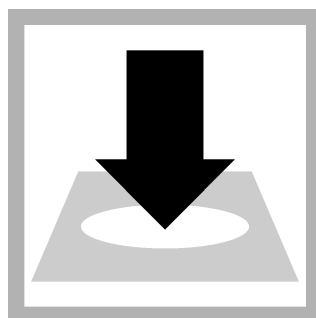
8. Put the stopper on the sample cell. Shake to dissolve the reagent.



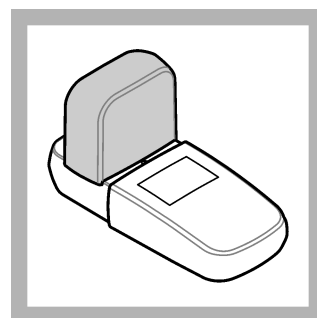
9. Set and start a timer for 15 minutes. A 15-minute reaction time starts.



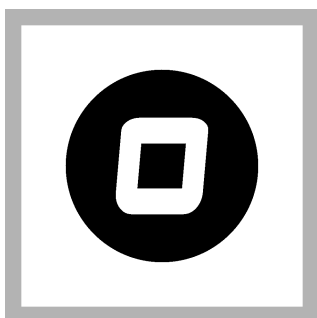
10. When the timer expires, clean the blank sample cell.



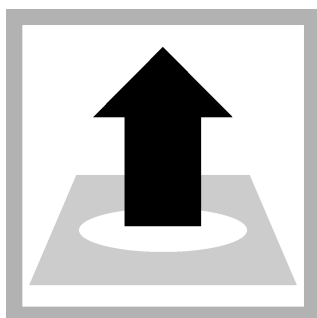
11. Insert the blank into the cell holder. Point the diamond mark on the sample cell toward the keypad.



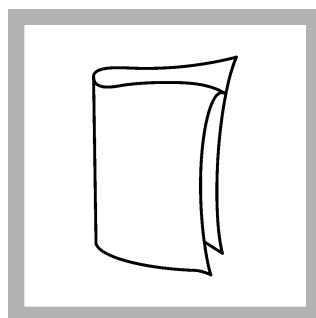
12. Install the instrument cap over the cell holder.



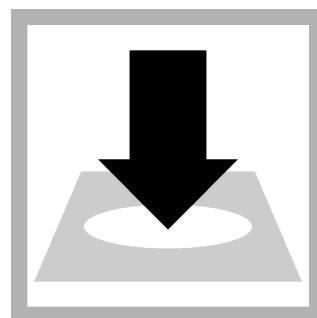
13. Push **ZERO**. The display shows "0.00".



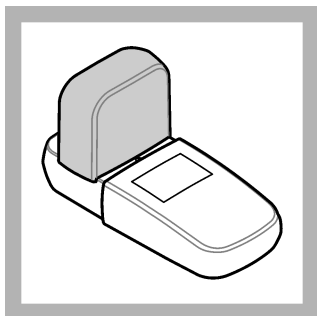
14. Remove the sample cell from the cell holder.



15. Clean the prepared sample cell.



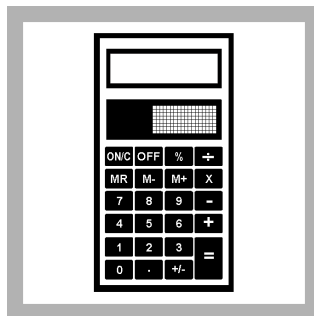
16. Insert the prepared sample into the cell holder. Point the diamond mark on the sample cell toward the keypad.



17. Install the instrument cap over the cell holder.



18. Push **READ**. Results show in mg/L ammonia as nitrogen ($\text{NH}_3\text{-N}$).



19. If the sample was diluted, multiply the result by the applicable dilution factor from [Table 1](#) on page 2.

Note: To change the results to mg/L ammonia (NH_3), multiply the result by 1.22. To change the results to mg/L ammonium (NH_4^+), multiply the result by 1.29.

Interferences

Interfering substance	Interference level
Calcium	1000 mg/L as CaCO_3
Iron	All levels. Correct for iron interference as follows: <ol style="list-style-type: none"> Use one of the Iron, Total procedures to measure the iron concentration of the sample. Use an iron standard solution to add iron to the deionized water blank so that the blank has the same iron concentration as the sample. The iron interference will be zeroed out from the test result.
Magnesium	6000 mg/L as CaCO_3
Monochloramine	Monochloramine that is in chloraminated drinking water interferes directly at all levels and gives high results. Use a Free Ammonia and Monochloramine method to determine free ammonia in these sample matrices.
Nitrate	100 mg/L as $\text{NO}_3^- \text{-N}$
Nitrite	12 mg/L as $\text{NO}_2^- \text{-N}$
pH	Adjust acidic or basic samples to approximately pH 7. Use 1 N sodium hydroxide standard solution for acidic samples and 1 N hydrochloric acid standard solution for basic samples.
Phosphate	100 mg/L as $\text{PO}_4^{3-} \text{-P}$
Sulfate	300 mg/L as SO_4^{2-}
Sulfide	Sulfide will intensify the color. Remove sulfide interference as follows: <ol style="list-style-type: none"> Measure approximately 350 mL of sample in a 500-mL Erlenmeyer flask. Add the contents of one Sulfide Inhibitor Reagent Powder Pillow. Swirl to mix. Filter the sample through a folded filter paper and filter funnel. Use the filtered sample in the test procedure.
Other substances	Less common interferences such as hydrazine and glycine cause intensified colors in the prepared sample. Turbidity and color will give incorrect high values. Samples with severe interferences require distillation. Use the distillation procedure that is supplied with the distillation set.

Pollution prevention and waste management

The ammonia salicylate reagent contains sodium nitroprusside and must be disposed of as a hazardous waste. Dispose of reacted solutions according to local, state and federal regulations.

Accuracy check

Standard additions method

Use the standard additions method to validate the test procedure, reagents and instrument and to find if there is an interference in the sample.

Items to collect:

- Ammonia Nitrogen Standard Solution, 10 mg/L as $\text{NH}_3\text{-N}$
 - Mixing cylinders, 25-mL (3)
 - Pipet, TenSette®, 0.1–1.0 mL and tips
1. Prepare three spiked samples: use the TenSette pipet to add 0.2 mL, 0.4 mL and 0.6 mL of the standard solution, respectively, to three 25-mL portions of fresh sample. Mix well.
 2. Use the test procedure to measure the concentration of each of the spiked samples. Start with the smallest sample spike. Measure each of the spiked samples in the instrument.
 3. Compare the expected result to the actual result. The expected ammonia nitrogen concentration increase is 0.08 mg/L for each 0.2 mL of standard that is added (with no sample dilution).

Standard solution method

Use the standard solution method to validate the test procedure, the reagents and the instrument.

Items to collect:

- Ammonia Nitrogen Standard Solution, 10 mg/L as $\text{NH}_3\text{-N}$
 - 100-mL volumetric flask, Class A
 - 4-mL volumetric pipet, Class A and pipet filler
 - Deionized water
1. Prepare a 0.40 mg/L ammonia nitrogen standard solution as follows:
 - a. Use a pipet to add 4.0 mL of 10 mg/L ammonia nitrogen standard solution into the volumetric flask.
 - b. Dilute to the mark with deionized water. Mix well. Prepare this solution daily.
 2. Use the test procedure to measure the concentration of the prepared standard solution.
 3. Compare the expected result to the actual result.

Note: The factory calibration can be adjusted slightly with the standard calibration adjust option so that the instrument shows the expected value of the standard solution. The adjusted calibration is then used for all test results. This adjustment can increase the test accuracy when there are small variations in the reagents or instruments.

Method performance

The method performance data that follows was derived from laboratory tests that were measured on a DR300 and a Pocket Colorimeter II during ideal test conditions. Users can get different results under different test conditions.

Precision (95% confidence interval)0.60 ± 0.05 mg/L NH₃-N**Summary of method**

Ammonia compounds combine with chlorine to form monochloramine. Monochloramine reacts with salicylate to form 5-aminosalicylate. The 5-aminosalicylate is oxidized in the presence of a sodium nitroprusside catalyst to form a blue-colored compound. The blue color is masked by the yellow color from the excess reagent to give a final green-colored solution.

Consumables and replacement items**Required reagents**

Description	Quantity/Test	Unit	Item no.
Nitrogen Ammonia Reagent Set, 10 mL, includes:	—	100 tests	2668000
Ammonia Cyanurate Reagent Powder Pillow, 10 mL	2	100/pkg	2653199
Ammonia Salicylate Reagent Powder Pillow, 10 mL	2	100/pkg	2653299

Required apparatus

Description	Quantity/test	Unit	Item no.
Sample cells, 10-mL round, 25 mm x 60 mm	2	6/pkg	2427606

Recommended standards and apparatus

Description	Unit	Item no.
Flask, volumetric, Class A, 100 mL, glass	each	1457442
Nitrogen Ammonia Standard Solution, 10-mg/L NH ₃ -N	500 mL	15349
Nitrogen Ammonia Standard Solution, 10-mL Voluette [®] Ampule, 50-mg/L NH ₃ -N	16/pkg	1479110
Pipet, TenSette [®] , 0.1–1.0 mL	each	1970001
Pipet tips for TenSette [®] Pipet, 0.1–1.0 mL	50/pkg	2185696
Pipet tips for TenSette [®] Pipet, 0.1–1.0 mL	1000/pkg	2185628
Pipet, volumetric, Class A, 4.00 mL	each	1451504
Wastewater Effluent Standard Solution, Mixed Parameter, for NH ₃ -N, NO ₃ -N, PO ₄ ³⁻ , COD, SO ₄ ²⁻ , TOC	500 mL	2833249
Water, deionized	4 L	27256

Optional reagents and apparatus

Description	Unit	Item no.
Ampule Breaker, 10-mL Voluette [®] Ampules	each	2196800
Mixing cylinder, graduated, 25-mL	each	2088640
Distillation heater and support for apparatus set, 115 VAC option	each	2274400
Distillation apparatus set, general purpose	each	2265300
Flask, Erlenmeyer, 500 mL	each	50549
Funnel, poly, 65 mm	each	108367
Distillation heater and support for apparatus set, 230 VAC option	each	2274402

Optional reagents and apparatus (continued)

Description	Unit	Item no.
Filter Paper, folded, 2–3-micron, pleated, 12.5-cm	100/pkg	189457
Pipet, serological, 2 mL	each	53236
Sodium Hydroxide Solution, 5 N	50 mL	245026
Sodium Thiosulfate, 0.1 N	100 mL	32332
Sulfide Inhibitor Reagent Powder Pillows	100/pkg	241899
Sulfuric Acid, concentrated, ACS	500 mL	97949
Sulfuric Acid Standard Solution, 1 N	100 mL MDB	127032



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HACH COMPANY
WORLD HEADQUARTERS
Telephone: (970) 669-3050
FAX: (970) 669-2932

Chlorine, Free and Total, Low Range

DOC316.53.01450

USEPA DPD Method¹

Method 8021 (Free) 8167 (Total)

0.02 to 2.00 mg/L Cl₂ (LR)

Powder Pillows or AccuVac[®] Ampuls

Scope and application: For testing residual chlorine and chloramines in water, wastewater, estuary water and seawater; USEPA-accepted for reporting for drinking and wastewater analyses.² This product has not been evaluated to test for chlorine and chloramines in medical applications in the United States.

¹ Adapted from Standard Methods for the Examination of Water and Wastewater.

² Procedure is equivalent to USEPA and Standard Method 4500-Cl G for drinking water and wastewater analysis.



Test preparation

Before starting

Analyze the samples immediately. The samples cannot be preserved for later analysis.

Always do tests in sample cells or AccuVac[®] Ampuls. Do not put the instrument in the sample or pour the sample into the cell holder.

Make sure that the sample cells are clean and there are no scratches where the light passes through them.

Rinse the sample cell and cap with the sample three times before the sample cell is filled.

Make sure that there are no fingerprints or liquid on the external surface of the sample cells or AccuVac[®] Ampuls. Wipe with a lint-free cloth before measurement.

Cold waters can cause condensation on the sample cell or bubbles in the sample cell during color development. Examine the sample cell for condensation or bubbles. Remove condensation with a lint-free cloth. Invert the sample cell to remove bubbles.

Install the instrument cap over the cell holder before ZERO or READ is pushed.

After the test, immediately empty and rinse the sample cell. Rinse the sample cell and cap three times with deionized water.

Do not use the same sample cells for free and total chlorine. If trace iodide from the total chlorine reagent is carried over into the free chlorine determination, monochloramine will interfere. It is best to use separate, dedicated sample cells for free and total chlorine measurements.

If the test result is over-range, or if the sample temporarily turns yellow after the reagent addition, dilute the sample with a known volume of high quality, chlorine demand-free water and do the test again. Some loss of chlorine may occur due to the dilution. Multiply the result by the dilution factor. Additional methods are available to measure chlorine without dilution.

For the best results, measure the reagent blank value for each new lot of reagent. Replace the sample with deionized water in the test procedure to determine the reagent blank value. Subtract the reagent blank value from the sample results.

The AccuVac Ampul Snapper makes AccuVac Ampul tests easier to do. The AccuVac Ampul Snapper keeps the broken tip of the ampul, prevents exposure to the sample and provides controlled conditions for filling the ampule.

An AccuVac Ampul for Blanks can be used to zero the instrument in the AccuVac test procedure.

The SwifTest Dispenser for Free Chlorine or Total Chlorine can be used in place of the powder pillow in the test procedures. One dispensation equals one powder pillow for 10-mL samples.

Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

Dispose of reacted solutions according to local, state and federal regulations. Refer to the Safety Data Sheets for disposal information for unused reagents. Refer to the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.

Items to collect

Powder pillows

Description	Quantity
Chlorine, Free: DPD Free Chlorine Reagent Powder Pillows, 10-mL	1
Chlorine, Total: DPD Total Chlorine Reagent Powder Pillows, 10-mL	1
Sample cells, 25-mm (10 mL)	2

Refer to [Consumables and replacement items](#) on page 7 for order information.

AccuVac Ampuls

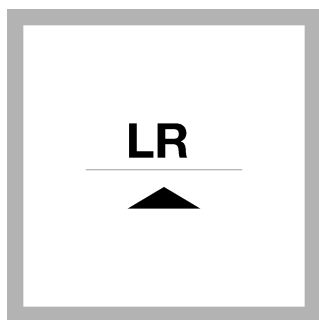
Description	Quantity
Chlorine, Free: DPD Free Chlorine Reagent AccuVac Ampuls	1
Chlorine, Total: DPD Total Chlorine Reagent AccuVac Ampuls	1
Beaker, 50-mL	1
Stopper for 18-mm tubes and AccuVac Ampuls	1
Sample cells, 25-mm (10 mL)	1

Refer to [Consumables and replacement items](#) on page 7 for order information.

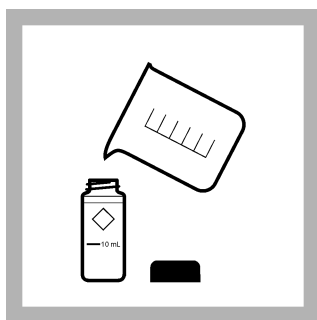
Sample collection

- Analyze the samples immediately. The samples cannot be preserved for later analysis.
- Chlorine is a strong oxidizing agent and is unstable in natural waters. Chlorine reacts quickly with various inorganic compounds and more slowly with organic compounds. Many factors, including reactant concentrations, sunlight, pH, temperature and salinity influence the decomposition of chlorine in water.
- Collect samples in clean glass bottles. Do not use plastic containers because these can have a large chlorine demand.
- Pretreat glass sample containers to remove chlorine demand. Soak the containers in a weak bleach solution (1 mL commercial bleach to 1 liter of deionized water) for at least 1 hour. Rinse fully with deionized or distilled water. If sample containers are rinsed fully with deionized or distilled water after use, only occasional pretreatment is necessary.
- Make sure to get a representative sample. If the sample is taken from a spigot or faucet, let the water flow for at least 5 minutes. Let the container overflow with the sample several times and then put the cap on the sample container so that there is no headspace (air) above the sample.

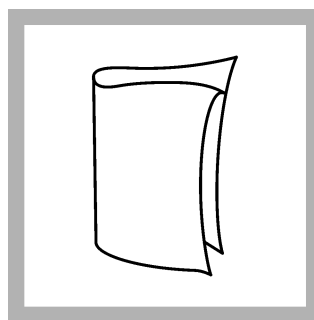
Powder pillow procedure



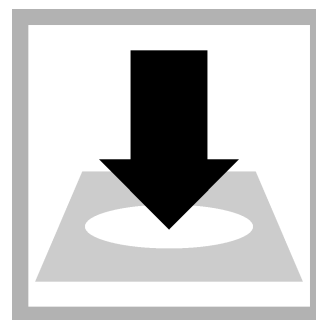
1. Set the instrument to low range (LR).
For DR300, push the up arrow button. For PCII, push the menu button, checkmark button, then the menu button again.



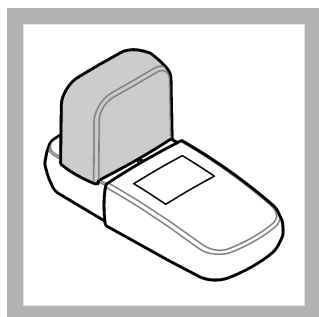
2. Prepare the blank:
Rinse a sample cell and cap three times with sample. Fill the sample cell to the 10-mL mark with sample. Close the sample cell.



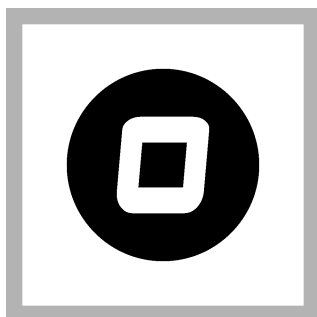
3. Clean the blank sample cell.



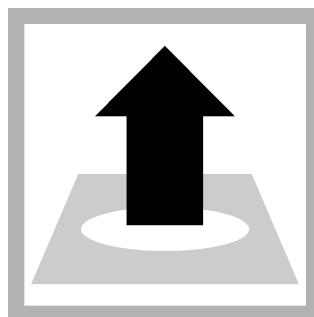
4. Insert the blank into the cell holder. Point the diamond mark on the sample cell toward the keypad.



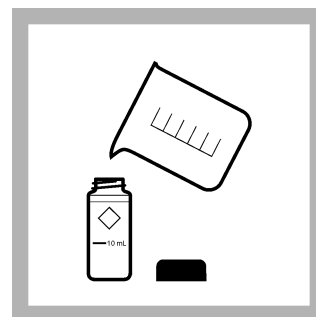
5. Install the instrument cap over the cell holder.



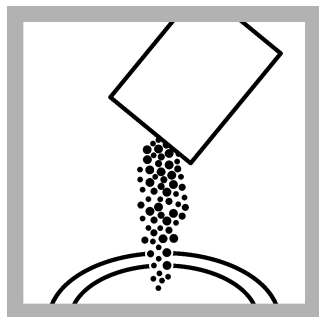
6. Push **ZERO**. The display shows "0.00".



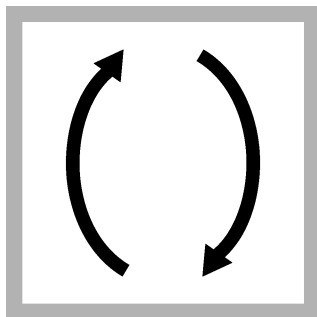
7. Remove the sample cell from the cell holder.



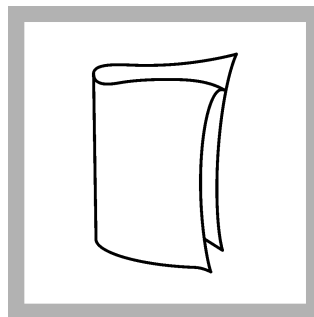
8. Prepare the sample:
Rinse a second sample cell and cap three times with sample. Fill the sample cell to the 10-mL mark with sample.



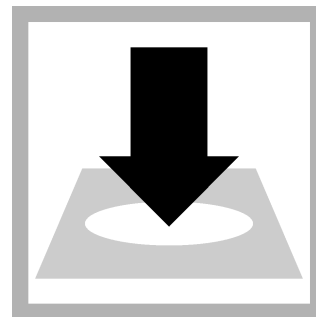
9. Add one 10-mL DPD Free Chlorine Reagent Powder Pillow or one 10-mL DPD Total Chlorine Reagent Powder Pillow to the second sample cell.



10. Close the sample cell. Invert the sample cell for about **20 seconds** to dissolve the reagent. Undissolved powder will not affect accuracy.
A pink color will show if chlorine is in the sample.



11. Clean the prepared sample cell.

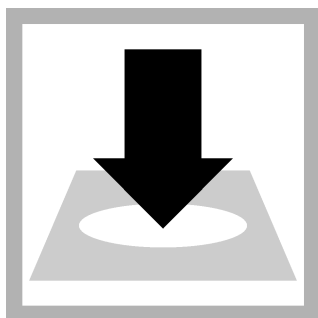


12. Free chlorine measurement: Within 1 minute of the reagent addition, insert the prepared sample into the cell holder. Point the diamond mark on the sample cell toward the keypad.

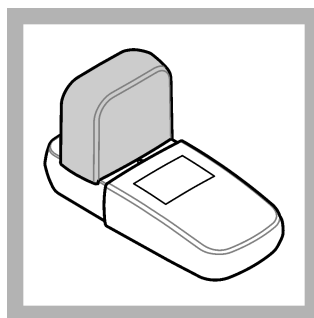
Go to step [15](#).



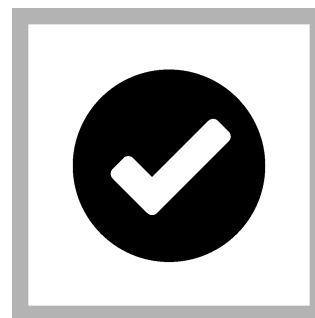
13. Set and start a timer for 3 minutes. A 3-minute reaction time starts.



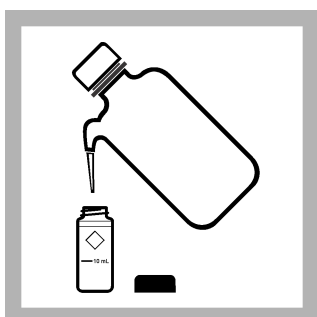
14. Total chlorine measurement: After 3 minutes and within 6 minutes of the reagent addition, insert the prepared sample into the cell holder. Point the diamond mark on the sample cell toward the keypad.



15. Install the instrument cap over the cell holder.

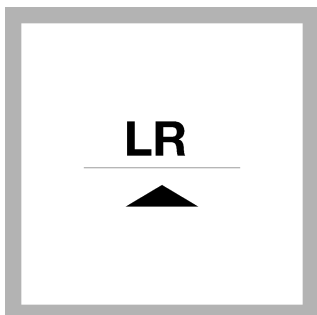


16. Push **READ**. Results show in mg/L Cl₂.

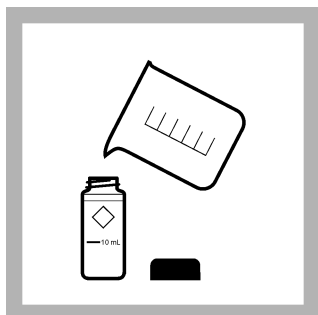


17. Immediately empty the sample cell. Rinse the sample cell and cap three times with deionized water.

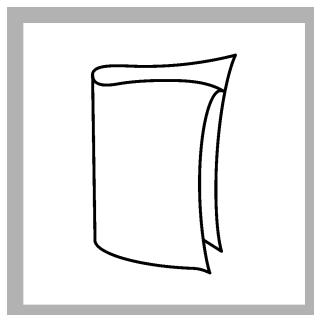
AccuVac[®] Ampul procedure



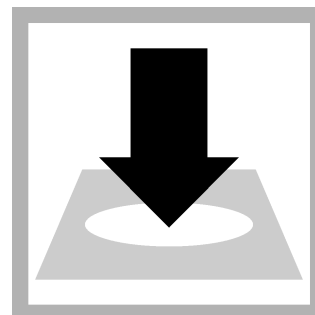
1. Set the instrument to low range (LR).
For DR300, push the up arrow button. For PCII, push the menu button, checkmark button, then the menu button again.



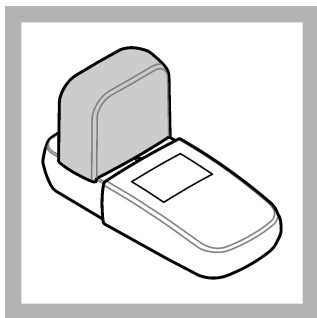
2. Prepare the blank: Rinse a sample cell and cap three times with sample. Fill the sample cell to the 10-mL mark with sample. Close the sample cell.



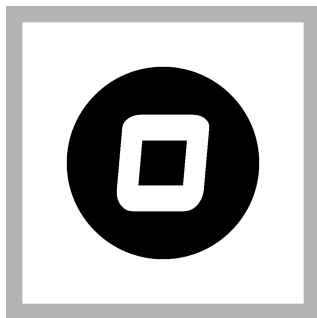
3. Clean the blank sample cell.



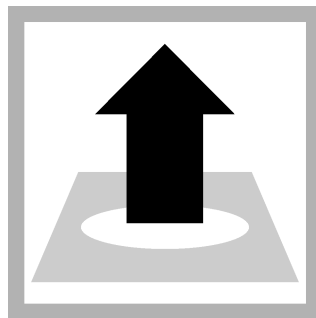
4. Insert the blank into the cell holder. Point the diamond mark on the sample cell toward the keypad.



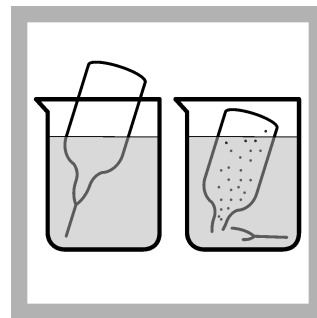
5. Install the instrument cap over the cell holder.



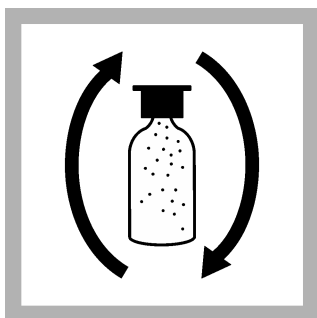
6. Push **ZERO**. The display shows "0.00".



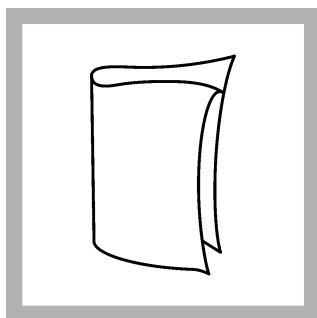
7. Remove the sample cell from the cell holder.



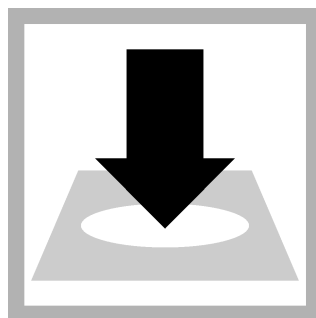
8. **Prepare the sample:** Collect at least 40 mL of sample in a 50-mL beaker. Fill a DPD Free Chlorine Reagent AccuVac Ampul or a DPD Total Chlorine Reagent AccuVac Ampul with sample. Keep the tip immersed while the AccuVac Ampul fills completely.



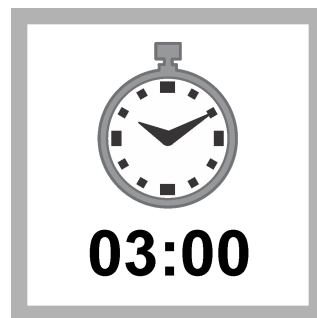
9. Quickly invert the AccuVac Ampul several times to mix.



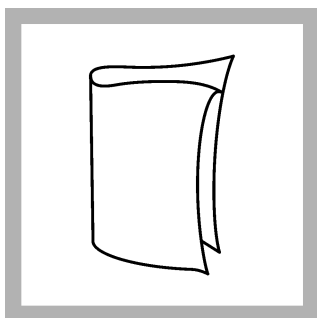
10. Clean the AccuVac Ampul.



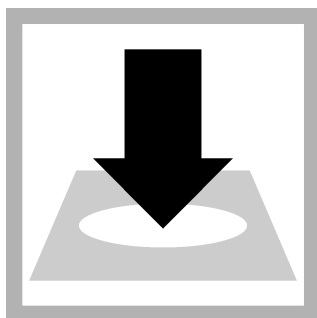
11. **Free chlorine measurement:** Within 1 minute of the reagent addition, insert the prepared sample AccuVac Ampul into the cell holder. Go to step 15.



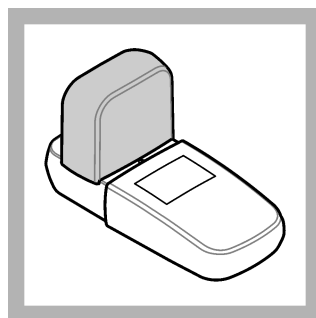
12. Set and start a timer for 3 minutes. A 3-minute reaction time starts.



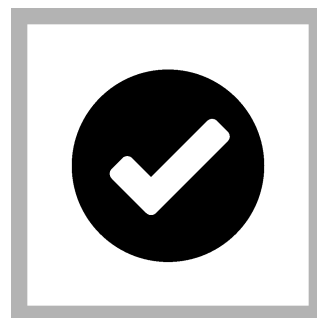
13. When the timer expires, clean the prepared sample cell.



14. **Total chlorine measurement:** Within 6 minutes of the reagent addition, insert the prepared sample AccuVac Ampul into the cell holder.



15. Install the instrument cap over the cell holder.



16. Push **READ**. Results show in mg/L Cl₂.

Interferences

Interfering substance	Interference level
Acidity	More than 150 mg/L CaCO ₃ . The full color may not develop or the color may fade instantly. Adjust to pH 6–7 with 1 N Sodium Hydroxide. Measure the amount to add on a separate sample aliquot, then add the same amount to the sample that is tested. Correct the test result for the dilution from the volume addition.
Alkalinity	More than 250 mg/L CaCO ₃ . The full color may not develop or the color may fade instantly. Adjust to pH 6–7 with 1 N Sulfuric Acid. Measure the amount to add on a separate sample aliquot, then add the same amount to the sample that is tested. Correct the test result for the dilution from the volume addition.
Bromine, Br ₂	Positive interference at all levels
Chlorine Dioxide, ClO ₂	Positive interference at all levels
Inorganic chloramines	Positive interference at all levels
Chloramines, organic	May interfere in the result for total chlorine analysis
Hardness	No effect at less than 1000 mg/L as CaCO ₃
Manganese, Oxidized (Mn ⁴⁺ , Mn ⁷⁺) or Chromium, Oxidized (Cr ⁶⁺)	Pre-treat the sample as follows: <ol style="list-style-type: none"> 1. Adjust the sample pH to 6–7. 2. Add 3 drops of Potassium Iodide (30-g/L) to 10 mL of sample. 3. Mix and wait 1 minute. 4. Add 3 drops of Sodium Arsenite (5-g/L) and mix. 5. Use the test procedure to measure the concentration of the treated sample. 6. Subtract this result from the result without the treatment to obtain the correct chlorine concentration.
Monochloramine	Causes a gradual drift to higher readings. When read within 1 minute after reagent addition, 3 mg/L monochloramine causes less than a 0.1 mg/L increase in the reading.
Ozone	Positive interference at all levels
Peroxides	May interfere
Highly buffered samples or extreme sample pH	Can prevent the correct pH adjustment (of the sample) by the reagents. Sample pretreatment may be necessary. Adjust to pH 6–7 with acid (Sulfuric Acid, 1 N) or base (Sodium Hydroxide, 1 N). Correct the test result for the dilution caused by the volume additions.

Pollution prevention and waste management

If sodium arsenite was added to the sample for manganese or chromium interferences, the reacted samples will contain arsenic and must be disposed of as a hazardous waste. Dispose of reacted solutions according to local, state and federal regulations. must be disposed of as a hazardous waste. Dispose of reacted solutions according to local, state and federal regulations.

Accuracy check

Standard additions method

Use the standard additions method to validate the test procedure, reagents and instrument and to find if there is an interference in the sample.

Items to collect:

- Chlorine Standard Solution, 2-mL PourRite® Ampule, 25–30 mg/L (use mg/L on label)
- Ampule breaker
- Pipet, TenSette®, 0.1–1.0 mL and tips

1. Prepare three spiked samples: use the TenSette pipet to add 0.1 mL, 0.2 mL and 0.3 mL of the standard solution, respectively, to three 10-mL portions of fresh sample. Mix well.
Note: For AccuVac[®] Ampuls, add 0.4 mL, 0.8 mL and 1.2 mL of the standard solution to three 50-mL portions of fresh sample.
2. Use the test procedure to measure the concentration of each of the spiked samples. Start with the smallest sample spike. Measure each of the spiked samples in the instrument.
3. Compare the expected result to the actual result. The expected increase in the chlorine concentration is the Cl₂ mg/L concentration from the label of the standard solution multiplied by 0.1 mL for every 10 mL of standard solution added.

Standard solution method

If the Standard Calibration Adjust feature is used to adjust the calibration curve of the DR300 or Pocket Colorimeter II, the concentration of the chlorine standard must be between 0.50 and 1.50 mg/L chlorine for the LR procedure.

Verification of on-line analyzers

This procedure can be used to meet the requirements of USEPA Method 334.0 - Determination of Residual Chlorine in Drinking Water Using an On-line Chlorine Analyzer. The procedure and requirements for compliance with EPA Method 334.0 can be downloaded directly from <http://www.hach.com/method334>.

Method performance

The method performance data that follows was derived from laboratory tests that were measured on a DR300 and a Pocket Colorimeter II during ideal test conditions. Users can get different results under different test conditions.

Precision (95% confidence interval)
1.00 ± 0.05 mg/L Cl ₂

Summary of method

Chlorine can be in water as free chlorine and as combined chlorine. Both forms can be in the same solution and can be determined together as total chlorine. Free chlorine is in a solution as hypochlorous acid or hypochlorite ion. Combined chlorine represents a combination of chlorine-containing compounds, including monochloramine, dichloramine, nitrogen trichloride and other chloro derivatives. The combined chlorine oxidizes iodide (I⁻) to iodine (I₂). The iodine and free chlorine reacts with DPD (N,N-diethyl-p-phenylenediamine) to form a red solution. The color intensity is proportional to the chlorine concentration. To determine the concentration of combined chlorine, complete a free chlorine test and a total chlorine test. Subtract the results of the free chlorine test from the total chlorine test to get the combined chlorine concentration.

Consumables and replacement items

Required reagents

Description	Quantity/test	Unit	Item no.
DPD Free Chlorine Reagent Powder Pillow, 10 mL	1	100/pkg	2105569
DPD Total Chlorine Reagent Powder Pillow, 10 mL	1	100/pkg	2105669
OR			
DPD Free Chlorine Reagent AccuVac [®] Ampul	1	25/pkg	2502025
DPD Total Chlorine Reagent AccuVac [®] Ampul	1	25/pkg	2503025

Required apparatus (powder pillows)

Description	Quantity/test	Unit	Item no.
Sample cells, 10-mL round, 25 mm x 60 mm	2	6/pkg	2427606

Required apparatus (AccuVac Ampul)

Description	Quantity/Test	Unit	Item no.
Sample cell, 10-mL round, 25 mm x 60 mm	1	6/pkg	2427606
Beaker, 50 mL	1	each	50041H
Stoppers for 18-mm tubes and AccuVac Ampuls	2	6/pkg	173106

Recommended standards and apparatus

Description	Unit	Item no.
Chlorine Standard Solution, 2-mL PourRite [®] Ampules, 25–30 mg/L	20/pkg	2630020
PourRite [®] Ampule Breaker, 2-mL	each	2484600

Optional reagents and apparatus

Description	Unit	Item no.
AccuVac [®] Ampul Snapper	each	2405200
Mixing cylinder, graduated, 25-mL	each	2088640
Potassium Iodide, 30-g/L	100 mL	34332
Sodium Arsenite, 5-g/L	100 mL	104732
Sodium Hydroxide Standard Solution, 1.0 N	100 mL MDB	104532
Sulfuric Acid Standard Solution, 1 N	100 mL MDB	127032
Pipet, TenSette [®] , 0.1–1.0 mL	each	1970001
Pipet tips for TenSette [®] Pipet, 0.1–1.0 mL	50/pkg	2185696
Pipet tips for TenSette [®] Pipet, 0.1–1.0 mL	1000/pkg	2185628
Paper, pH, 0–14 pH range	100/pkg	2601300
DPD Free Chlorine Reagent Powder Pillows, 10 mL	1000/pkg	2105528
DPD Total Chlorine Reagent Powder Pillows, 10 mL	1000/pkg	2105628
SwifTest [™] dispenser for free chlorine ¹	each	2802300
SwifTest [™] dispenser for total chlorine ²	each	2802400
DPD Free Chlorine Reagent, 10-mL, SwifTest [™] Dispenser refill vial	250 tests	2105560
DPD Total Chlorine Reagent, 10-mL, SwifTest [™] Dispenser refill vial	250 tests	2105660
SpecCheck [™] Secondary Standard Kit, Chlorine DPD, 0–2.0 mg/L Set	each	2635300
Water, organic-free	500 mL	2641549

¹ Includes one vial of 2105560 for 250 tests.

² Includes one vial of 2105660 for 250 tests.



FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:
In the U.S.A. – Call toll-free 800-227-4224
Outside the U.S.A. – Contact the HACH office or distributor serving you.
On the Worldwide Web – www.hach.com; E-mail – techhelp@hach.com

HACH COMPANY
WORLD HEADQUARTERS
Telephone: (970) 669-3050
FAX: (970) 669-2932



Be Right™

SAFETY DATA SHEET

Issue Date 28-05-2020

Revision Date
04-Dec-2020

Version 10.8

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1. IDENTIFICATION

Product identifier

Product Name DPD Free Chlorine Reagent

Other means of identification

Product Code(s) 2105569

Safety data sheet number M00109

HMRIC # HMIRA Registry Number 9935 Filed 2016-04-11

Recommended use of the chemical and restrictions on use

Recommended Use Water Analysis. Determination of chlorine.

Uses advised against Consumer use.

Restrictions on use Please refer to the product labeling and packaging for information about appropriate use.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word

Warning

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Hazard statements

H315 - Causes skin irritation
H319 - Causes serious eye irritation

Precautionary statements

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P332 + P313 - If skin irritation occurs: Get medical attention
P362 - Take off contaminated clothing and wash before reuse
P280 - Wear protective gloves, protective clothing, eye protection, and face protection
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical attention

Other Hazards Known

None

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Chemical Family Mixture.
Chemical nature No information available.

Chemical name	CAS No	Percent Range	HMRIC #
Carboxylate Salt	-	60 - 70%	-
Phosphoric acid, disodium salt	7558-79-4	30 - 40%	-
Salt of N,N-Diethyl-p-Phenylenediamine	-	1 - 5%	-

4. FIRST AID MEASURES

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance.

Inhalation Remove to fresh air. Get medical attention immediately if symptoms occur.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. Do not rub affected area.

Skin contact Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical attention if irritation develops and persists.

Ingestion Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a physician.

Self-protection of the first aider Avoid contact with skin, eyes or clothing.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable Extinguishing Media	Caution: Use of water spray when fighting fire may be inefficient.
Specific hazards arising from the chemical	No information available.
Hazardous combustion products	Carbon monoxide, Carbon dioxide. Phosphorus oxides. Nitrogen oxides.
Special protective equipment for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

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Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies

Appropriate engineering controls

Engineering Controls Showers
Eyewash stations
Ventilation systems. Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures, such as personal protective equipment

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection Wear suitable gloves. Impervious gloves. Gloves must be inspected prior to use. The selected protective gloves have to satisfy the specifications of EU Directive 2016/425 and the standard EN 374 derived from it. Chemical resistant gloves made of butyl rubber or nitrile rubber category III according to EN 374-1:2016.

Eye/face protection If splashes are likely to occur, wear safety glasses with side-shields.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing.

General Hygiene Considerations Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Avoid contact with skin, eyes or clothing.

Environmental exposure controls Local authorities should be advised if significant spillages cannot be contained. Do not allow into any sewer, on the ground or into any body of water.

Thermal hazards None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Solid	Color	White to light pink
Appearance	powder	Odor threshold	No data available
Odor	Odorless		

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
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Molecular weight	No data available	
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pH 6.3 1% @ 20°C

Melting point/freezing point 110 °C / 230 °F

Boiling point / boiling range No data available

Evaporation rate Not applicable

Vapor pressure Not applicable

Relative vapor density No data available

Specific gravity (water = 1 / air = 1) 1.76

Partition Coefficient (n-octanol/water) log K_{ow} ~ 0

Soil Organic Carbon-Water Partition Coefficient log K_{oc} ~ 0

Autoignition temperature No data available

Decomposition temperature 110 °C / 230 °F

Dynamic viscosity Not applicable

Kinematic viscosity Not applicable

Solubility(ies)

Water solubility

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
Completely soluble	> 10000 mg/L	25 °C / 77 °F

Solubility in other solvents

<u>Chemical Name</u>	<u>Solubility classification</u>	<u>Solubility</u>	<u>Solubility Temperature</u>
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other information

Metal Corrosivity

Steel Corrosion Rate No data available
Aluminum Corrosion Rate No data available

Volatile Organic Compounds (VOC) Content

Not applicable

Chemical name	CAS No	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Carboxylate Salt	-	No data available	-
Phosphoric acid, disodium salt	7558-79-4	No data available	-
Salt of N,N-Diethyl-p-Phenylenediamine	-	Not applicable	-

Explosive properties

Upper explosion limit No data available
Lower explosion limit No data available

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Flammable properties

Flash point Not applicable

Flammability Limit in Air

Upper flammability limit: No data available

Lower flammability limit: No data available

Oxidizing properties

No data available.

Bulk density

No data available

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Possibility of hazardous reactions

None under normal processing.

Hazardous polymerization

None under normal processing.

Conditions to avoid

None known based on information supplied.

Incompatible materials

Strong acids. Strong bases. Strong oxidizing agents.

Hazardous decomposition products

Carbon dioxide. Carbon monoxide. Phosphorus oxides. Nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Inhalation	May cause irritation of respiratory tract.
Eye contact	Irritating to eyes. Causes serious eye irritation.
Skin contact	Causes skin irritation.
Ingestion	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.
Symptoms	Redness. May cause redness and tearing of the eyes.

Acute toxicity

Based on available data, the classification criteria are not met

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Product Acute Toxicity Data

No data available.

Ingredient Acute Toxicity Data

Test data reported below.

Oral Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	Rat LD ₅₀	695 mg/kg	None reported	None reported	Outside testing

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Salt of N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -	None reported	None reported	None reported	None reported	No information available

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	19,881.00 mg/kg
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Skin corrosion/irritation

Classification based on data available for ingredients. Irritating to skin.

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

Test data reported below.

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Phosphoric acid, disodium salt (30 - 40%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Skin irritant	RTECS (Registry of Toxic Effects of Chemical Substances)

Serious eye damage/irritation

Classification based on data available for ingredients. Irritating to eyes.

Product Serious Eye Damage/Eye Irritation Data

No data available.

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Ingredient Eye Damage/Eye Irritation Data

Test data reported below.

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Phosphoric acid, disodium salt (30 - 40%) CAS#: 7558-79-4	Standard Draize Test	Rabbit	500 mg	24 hours	Eye irritant	RTECS (Registry of Toxic Effects of Chemical Substances)

Respiratory or skin sensitization

Based on available data, the classification criteria are not met.

Product Sensitization Data

No data available.

Ingredient Sensitization Data

No data available.

STOT - single exposure

Based on available data, the classification criteria are not met.

Product Specific Target Organ Toxicity Single Exposure Data

No data available.

Ingredient Specific Target Organ Toxicity Single Exposure Data

No data available.

STOT - repeated exposure

Based on available data, the classification criteria are not met.

Product Specific Target Organ Toxicity Repeat Dose Data

No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

No data available.

Carcinogenicity

Based on available data, the classification criteria are not met.

Product Carcinogenicity Data

No data available.

Ingredient Carcinogenicity Data

No data available.

Chemical name	CAS No	ACGIH	IARC	NTP	OSHA
Carboxylate Salt	-	-	-	-	-
Phosphoric acid, disodium salt	7558-79-4	-	-	-	-
Salt of N,N-Diethyl-p-Phenylenediamine	-	-	-	-	-

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply

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NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of Labor)	Does not apply

Germ cell mutagenicity

Based on available data, the classification criteria are not met.

Product Germ Cell Mutagenicity invitro Data

No data available.

Ingredient Germ Cell Mutagenicity invitro Data

Test data reported below.

Product Germ Cell Mutagenicity invivo Data

No data available.

Ingredient Germ Cell Mutagenicity invivo Data

No data available.

Reproductive toxicity

Based on available data, the classification criteria are not met.

Product Reproductive Toxicity Data

No data available.

Ingredient Reproductive Toxicity Data

No data available.

Aspiration hazard

Based on available data, the classification criteria are not met.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Based on available data, the classification criteria are not met.

Unknown aquatic toxicity

0 % of the mixture consists of component(s) of unknown hazards to the aquatic environment.

Product Ecological Data

Aquatic Acute Toxicity

No data available.

Aquatic Chronic Toxicity

No data available.

Ingredient Ecological Data

Aquatic Acute Toxicity

Test data reported below.

Fish

Crustacea

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Salt of	48 Hours	<i>Daphnia magna</i>	EC ₅₀	10.8 mg/L	Internal Data

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N,N-Diethyl-p-Phenyl enediamine (1 - 5%) CAS#: -					
---	--	--	--	--	--

Algae

Aquatic Chronic Toxicity

No data available.

Persistence and degradability

Product Biodegradability Data

No data available.

Bioaccumulation

MATERIAL DOES NOT BIOACCUMULATE

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water)

log K_{ow} ~ 0

Mobility

Soil Organic Carbon-Water Partition Coefficient

log K_{oc} ~ 0

Other adverse effects

No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products

Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging

Do not reuse empty containers.

US EPA Waste Number

Not applicable

14. TRANSPORT INFORMATION

DOT

Not regulated

TDG

Not regulated

IATA

Not regulated

IMDG

Not regulated

Note:

No special precautions necessary.

Additional information

15. REGULATORY INFORMATION

National Inventories

TSCA Complies
 DSL/NDSL Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
 DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

EINECS/ELINCS Complies
 ENCS Complies
 IECS Complies
 Existing substances Complies
 PICCS Complies
 TCSI Complies
 AICS Complies
 NZIoC Complies

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
 ENCS - Japan Existing and New Chemical Substances
 IECS - China Inventory of Existing Chemical Substances
 KECL - Korean Existing and Evaluated Chemical Substances
 PICCS - Philippines Inventory of Chemicals and Chemical Substances
 TCSI - Taiwan Chemical Substances Inventory
 AICS - Australian Inventory of Chemical Substances
 NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard Yes
 Chronic Health Hazard No
 Fire hazard No
 Sudden release of pressure hazard No
 Reactive Hazard No

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Phosphoric acid, disodium salt 7558-79-4	5000 lb	-	-	X

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Phosphoric acid, disodium salt 7558-79-4	5000 lb	-	RQ 5000 lb final RQ RQ 2270 kg final RQ

US State Regulations

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California Proposition 65

This product does not contain any Proposition 65 chemicals

IMERC: Not applicable

New Jersey Trade Secret Registry Number 80100131-5001 (Carboxylate Salt) New Jersey Trade Secret Registry Number 80100131-5002 (DPD Salt) New York Trade Secret Registry Number 478 (DPD Salt) New York Trade Secret Registry Number 479 (Carboxylate Salt) This product complies with Pennsylvania Trade Secret Regulations. This product is registered as a trade secret in the state of Illinois. This product is registered as a trade secret in the state of Massachusetts. This product is registered as a trade secret in the state of New York.

U.S. State Right-to-Know Regulations

This product may contain substances regulated by state right-to-know regulations.

Chemical name	New Jersey	Massachusetts	Pennsylvania
Phosphoric acid, disodium salt 7558-79-4	X	X	X

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Phosphoric acid, disodium salt	180.0910	21 CFR 182.1778,21 CFR 182.6290,21 CFR 182.6778,21 CFR 182.8778

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 2	Flammability - 0	Instability - 0	Physical and chemical properties -
HMIS	Health hazards - 2	Flammability - 0	Physical hazards - 0	Personal protection - X - I

Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH Immediately Dangerous to Life or Health
ACGIH ACGIH (American Conference of Governmental Industrial Hygienists)
NDF no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)
 MAC Maximum Allowable Concentration Ceiling Ceiling Limit Value

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X Listed Vacated These values have no official status. The only binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.

SKN*	Skin designation	SKN+	Skin sensitization
RSP+	Respiratory sensitization	**	Hazard Designation
C	Carcinogen	R	Reproductive toxicant
M	mutagen		

Prepared By Hach Product Compliance Department

Issue Date 28-05-2020

Revision Date 04-Dec-2020

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY©2019

End of Safety Data Sheet



Personalized PDF Catalog
Catalogue Generated February 12, 2021

VWR® UV Hand Lamps

Supplier: VWR International



Ultraviolet Lamps are used for many uses depending on wavelength of emitted UV light.

- ▶UV-A Hand Lamp - 365nm UV
- ▶UV-AC Hand Lamp - 365/254nm UV
- ▶UV-AB Hand Lamp - 365/302nm UV











Applications for 365nm UV include water testing, quality control inspection, nondestructive testing and sanitation

The lamps use 6-watt tubes and are manufactured of lightweight, rugged aluminum design with a scratch-resistant powder paint.

The UV-A Hand Lamp features two 365nm longwave UV tubes for brilliant fluorescence.

The UV-AC and UV-AB are Dual UV lamps. The UV-AC model has one tube each of 254nm and 365nm wavelengths. The UV-AB lamp has one tube each of 302nm and 365nm wavelengths.

ORDER

VWR Catalog Number	Unit	Price	Quantity	Description	Electrical	Wavelength
89131-488	Each	\$476.03		UV-A	115V	365 nm
						
89131-490	Each	\$476.03		UV-A	230V	365 nm
						
89131-498	Each	\$600.43		UV-AB	230V	302/365 nm
						
89131-496	Each	\$587.72		UV-AB	115V	302/365 nm
						
89131-492	Each	\$568.41		UV-AC	115V	254/365 nm
						



a xylem brand

YSI ProDSS Multiparameter Sampling Instrument

Portable digital sampling system for the measurement of pH, ORP, dissolved oxygen (optical-based sensor), conductivity, turbidity, temperature, depth and more.

Designed for use in applications such as surface water, groundwater, coastal waters, and aquaculture, the rugged and reliable ProDSS allows for measurement of up to 17 parameters. The ProDSS features user-replaceable digital smart sensors that are automatically recognized by the instrument when connected. A backlit color display, large memory, convenient calibration procedures, rechargeable battery, and powerful PC data management program (KorDSS) make the ProDSS user friendly. The optional GPS function, wide range of sensors, and varying cable lengths allow for complete customization of the ProDSS. Mil-spec (military spec) connectors and a waterproof (IP-67), rubber over-molded case ensures durability to provide years of sampling even in the harshest field conditions.



- Single cable design features universal ports which can accept any 4 sensors plus depth
- Long-life rechargeable lithium-ion battery to power handheld and sensors
- Color display and backlit keypad allow for sampling in all lighting conditions
- Digital smart sensors are automatically recognized by the instrument and store calibration data
- User-replaceable cables and sensors provide versatility, reduce down time and reduce overall cost of ownership
- Large memory (> 100,000 data sets) with extensive site list and Data ID tag capabilities
- KorDSS, a powerful data management software with geo-mapping capability, is included with the instrument
- USB On-The-Go connector for PC connection, recharging/powering the ProDSS and connecting directly to a USB stick
- Global Positioning System (GPS) (optional)
- Cable lengths up to 100 meters available with or without a depth sensor
- Rugged, waterproof case (IP-67 rated) with rubber over-mold and metal, military-spec (MS) cable connectors as well as rugged titanium sensors
- Multiple languages in handheld and KorDSS: English, Spanish, Portuguese, French, German, Italian, Japanese, Norwegian, and Chinese (simplified and traditional)
- Warranty: 3-year instrument; 2-year cable assembly and sensors; 1-year pH and pH/ORP sensor modules; 6-months ammonium, nitrate and chloride sensor modules.

Parameters:

- Dissolved Oxygen (Optical)
- Turbidity
- pH
- ORP/Redox
- Conductivity
- Specific Conductance
- Salinity
- Total Dissolved Solids (TDS)
- Resistivity
- Seawater Density
- Total Suspended Solids (TSS)
- Depth
- Ammonium
- Ammonia
- Chloride
- Nitrate
- Temperature

ProDSS General Specifications

Size	Instrument: Bulkhead with sensors, without depth (no guard): Bulkhead with sensors, with depth (no guard): Bulkhead with guard, without depth: Bulkhead with guard, with depth:	8.3 cm width x 21.6 cm length x 5.6 cm depth (3.27 in x 8.5 in x 2.21 in) 33.3 cm (13.11 in) length - the length with the ISE sensors is 34.04 cm (13.4 in) 35.84 cm (14.11 in) length - the length with the ISE sensors is 36.58 cm (14.4 in) 42.82 cm (16.86 in) length and 4.75 cm (1.87 in) outer diameter 45.36 cm (17.86 in) length and 4.75 cm (1.87 in) outer diameter
Weight with batteries	567 grams (1.25 lbs)	
Power	Rechargeable lithium-ion battery pack provides ~48 hours with the handheld only and ~20 hours with the handheld, cable and four sensors; battery recharge time is ~9 hours with the AC power adapter The instrument can also be powered via AC or external power pack through the USB port	
Instrument operating temperature	0 to 50 °C (32 to 122 °F)	
Instrument storage temperature	0 to 45 °C (32 to 113 °F) with battery installed; 0 to 60 °C (32 to 140 °F) without battery installed	
Display	Color, LCD graphic display; 3.9 cm width x 6.5 cm height	
USB port	Built-in micro USB On-The-Go port for PC connection, recharging/powering the ProDSS and connecting directly to a USB stick	
Cables	Available with or without depth sensor in 1, 4, 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100-meters	
Sensor ports	4 universal sensor ports on each cable; can accept any ProDSS sensor	
Warranty	3-year instrument; 2-year bulkhead, cable assembly, and sensors; 1-year pH and pH/ORP sensor modules, ODO sensor caps, and Li-ion battery pack; 6-months ammonium, nitrate, and chloride sensor modules	
Memory	> 100000 data sets	
Logging modes	Single point or continuous with autostable feature	
GLP compliance	Yes; 400 detailed GLP records can be stored and are available to view, download, and print.	
Languages	English, Spanish, Portuguese, French, German, Italian, Japanese, Norwegian, Simplified Chinese, Traditional Chinese	
Certifications	CEC, CE; RoHS; IP-67; WEEE; FCC; UN Part III, Section 38.3, Test methods for lithium-ion batteries (Class 9)	
GPS	Optional internal GPS; coordinates are stored with measurement data and site lists	
Sites and data ID	100 user-defined sites and 100 user-defined data ID tags	

ProDSS System Specifications (Instrument, Sensor, and Cable)

Sensor/Parameter	Range	Accuracy	Resolution	Units
Temperature	-5 to 70 °C (temperature compensation range for DO mg/L measurement: -5 to 50 °C)	±0.2 °C	0.1 °C or 0.1 °F (user selectable)	°C, °F, K
pH	0 to 14 pH units	±0.2 pH units	0.01 pH units	pH, pH mV
ORP	-1999 to 1999 mV	±20 mV	0.1 mV	mV
Dissolved Oxygen	0 to 500%, 0 to 50 mg/L	0 to 200%: ±1% of reading or 1% saturation, whichever is greater 200 to 500%: ±8% of reading 0 to 20 mg/L: ±0.1 mg/L or 1% of reading, whichever is greater 20 to 50 mg/L: ±8% of reading	0.01 mg/L and 0.1%, or 0.1 mg/L and 1% (user selectable)	% saturation, % saturation local, mg/L, ppm
Barometer	375 to 825 mmHg	±1.5 mmHg from 0 to 50 °C	0.1 mmHg	mmHg, inHg, mbar, psi, kPa, atm
Conductivity	0 to 200 mS/cm	0 - 100 mS/cm: ±0.5% of reading or .001 mS/cm, whichever is greater 100 - 200 mS/cm: ±1.0% of reading	0.001, 0.01 or 0.1 µS/cm (range dependent)	µS/cm, mS/cm
Specific Conductance*	0 to 200 mS/cm	0 - 100 mS/cm: ±0.5% of reading or .001 mS/cm, whichever is greater 100 - 200 mS/cm: ±1.0% of reading. User selectable reference temperature (15 to 25 °C; default 25 °C) and compensation coefficient (0 to 4%/°C; default 1.91%)	0.001, 0.01, 0.1 mS/cm	µS/cm or mS/cm
Salinity*	0 to 70 ppt	±1.0% of reading or ±0.1 ppt, whichever is greater	0.01 ppt	ppt or PSU
Total Dissolved Solids (TDS)*	0 to 100 g/L	Calculated from specific conductance and a user-selectable TDS multiplier (0.30 to 1.00; default 0.65)	0.001, 0.01, 0.1 g/L	mg/L, g/L, kg/L
Resistivity*	0 to 2 Mohms	±0.1% Full Scale	0.001, 0.01, 0.1 ohms	ohm-cm, kohm-cm, Mohm-cm
Seawater Density*	0.0 to 50.0 sigma, sigma T	-	0.1 sigma or sigma T	Sigma, Sigma T
Turbidity	0 to 4000 FNU	0 to 999 FNU: 0.3 FNU or ±2% of reading, whichever is greater 1000 to 4000 FNU: ±5% of reading	0.1 FNU	FNU, NTU
Total Suspended Solids (TSS)*	-	User correlated from turbidity field measurements and lab TSS measurements from grab samples	0.01, 0.1 mg/L	mg/L
Ammonium**	0 to 200 mg/L NH ₄ -N	±10% of reading or 2 mg/L, whichever is greater	0.01 mg/L	NH ₄ -N mg/L, NH ₄ -N mV
Ammonia*	0 to 200 mg/L NH ₃ -N	-	0.01 mg/L	NH ₃ -N mg/L
Chloride**	0 to 18000 mg/L Cl	±15% of reading or 5 mg/L, whichever is greater	0.01 mg/L	Cl mg/L, Cl mV
Nitrate**	0 to 200 mg/L NO ₃ -N	±10% of reading or 2 mg/L, whichever is greater	0.01 mg/L	NO ₃ -N mg/L, NO ₃ -N mV
Depth	0 to 328 feet (0 to 100 m)	±0.013 ft (±0.004 m) for 1, 4, and 10 m cables ±0.13 ft (±0.04 m) for cables 20 m and longer	0.001 m or 0.01 ft	m, ft

*Derived/calculated parameter **ISEs for freshwater only; 20 meter maximum depth

ProDSS System Specifications (Instrument, Sensor, and Cable)

Sensor/Parameter	Sensor Type/Measurement Method	Calibration	Maximum Depth	Warranty
Temperature	Thermistor, installed on conductivity sensor	Not available	100 m	2 years for conductivity/temperature sensor
pH	Combination glass bulb electrode, Ag/AgCl reference electrode with gelled electrolyte	1, 2, or 3 point	100 m	2 years for pH and pH/ORP sensors 1 year for pH and pH/ORP sensor modules
ORP	Platinum button with Ag/AgCl reference	1 point	100 m	2 years for pH/ORP sensor 1 year for pH/ORP sensor module
Dissolved Oxygen	Optical luminescence - lifetime method	1 or 2 point	100 m	2 years for optical DO sensor 1 year for optical DO sensor cap
Barometer	-	1 point	-	3 years, integrated into ProDSS handheld
Conductivity	Four nickel electrode cell	1 point	100 m	2 years for conductivity/temperature sensor
Specific Conductance*	Calculated from conductivity and temperature	1 point	-	-
Salinity*	Calculated from conductivity and temperature	1 point	-	-
Total Dissolved Solids (TDS)*	Calculated from specific conductance and a user-selectable TDS multiplier (0.30 to 1.00; default 0.65)	-	-	-
Resistivity*	Calculated from conductivity and temperature	-	-	-
Seawater Density*	Sigma is calculated from salinity, temperature, and pressure (depth) Sigma T is calculated from salinity and temperature	-	-	-
Turbidity	Nephelometric - Optical, 90° scatter Meets ISO 7027	1, 2, or 3 point	-	2 years for turbidity sensor
Total Suspended Solids (TSS)*	User correlated from turbidity field measurements and lab TSS measurements from grab samples	-	-	-
Ammonium**	Ion selective electrode	1, 2, or 3 point	20 m	2 years for ammonium sensor 6 months for ammonium sensor module
Ammonia*	Calculated from ammonium, temperature, salinity, and pH	-	-	-
Chloride**	Ion selective electrode	1, 2, or 3 point	20 m	2 years for chloride sensor 6 months for chloride sensor module
Nitrate**	Ion selective electrode	1, 2, or 3 point	20 m	2 years for nitrate sensor 6 months for nitrate sensor module
Depth	Pressure transducer	1 point	-	2 years, integrated into cable assembly

*Derived/calculated parameter

**ISEs for freshwater only ; 20 meter maximum depth

ProDSS Order Guide

Step 1: Order Instrument

All instruments include a rechargeable lithium-ion battery (pre-installed), hand strap, USB cable for charging the ProDSS battery and for connection to a PC, universal AC charger, cable for connection to a USB memory stick, ProDSS quick start guide, and USB memory stick containing KorDSS software and digital copy of the comprehensive manual.

626870-1: Handheld without GPS

626870-2: Handheld with GPS

Step 2: Order Cable

Cables do not include an integrated temperature sensor. All cables include 4 universal sensor ports and a maintenance kit (3 port plugs, tube of Krytox® lubricant, brush for conductivity probe, syringe for depth sensor, and sensor installation/removal tool). A 1 lb. weight is included with all cables 10 meters and longer while 10, 20, and 30 meter cables include a cable management kit.

626909: No depth sensor integrated in **1, 4, 10, 20, 30, 40, 50, 60, 70, 80, 90**, or **100** meter cable.

626910: Depth sensor integrated in **1, 4**, or **10** meter cable.

626911: Depth sensor integrated in **20, 30, 40, 50, 60, 70, 80, 90**, or **100** meter cable.

ProDSS Order Guide continued

Step 3: Order Smart Sensor(s)

A conductivity/temperature sensor *must* be installed in a ProDSS cable for accurate measurement of *all* parameters. All sensors, including conductivity/temperature, must be ordered separately. Please visit ysi.com/ProDSS for replacement module ordering information.

- | | |
|---|--|
| <input type="checkbox"/> 626900 : Optical dissolved oxygen (ODO) | <input type="checkbox"/> 626904 : pH/ORP sensor with module |
| <input type="checkbox"/> 626901 : Turbidity | <input type="checkbox"/> 626905 : Nitrate sensor with module |
| <input type="checkbox"/> 626902 : Conductivity and temperature | <input type="checkbox"/> 626906 : Ammonium sensor with module |
| <input type="checkbox"/> 626903 : pH sensor with module | <input type="checkbox"/> 626907 : Chloride sensor with module |

Step 4: Order Standards

- | | |
|---|--|
| <input type="checkbox"/> 065270 : Conductivity standard, 1000 umhos/cm (quart) | <input type="checkbox"/> 003841 : 1 mg/L ammonium standard (500 mL) |
| <input type="checkbox"/> 065272 : Conductivity standard, 10000 umhos/cm (quart) | <input type="checkbox"/> 003842 : 10 mg/L ammonium standard (500 mL) |
| <input type="checkbox"/> 065274 : Conductivity standard, 100000 umhos/cm (quart) | <input type="checkbox"/> 003843 : 100 mg/L ammonium standard (500 mL) |
| <input type="checkbox"/> 603824 : 2 pints each of 4, 7, and 10 pH buffers | <input type="checkbox"/> 003885 : 1 mg/L nitrate standard (500 mL) |
| <input type="checkbox"/> 061320 : Zobell standard for ORP (mV) calibration, 125 mL | <input type="checkbox"/> 003886 : 10 mg/L nitrate standard (500 mL) |
| <input type="checkbox"/> 608000 : Turbidity standard, 0 FNU (1 gallon) | <input type="checkbox"/> 003887 : 100 mg/L nitrate standard (500 mL) |
| <input type="checkbox"/> 607200 : Turbidity standard, 12.4 FNU (1 gallon) | |
| <input type="checkbox"/> 607300 : Turbidity standard, 124 FNU (1 gallon) | |
| <input type="checkbox"/> 607400 : Turbidity standard, 1010 FNU (1 gallon) | |
| <input type="checkbox"/> 005580 : Confidence Solution® to verify pH, ORP and conductivity data (not for calibration) | |

Step 5: Order Accessories

- | | |
|--|--|
| <input type="checkbox"/> 626946 : Large, hard-sided carrying case | <input type="checkbox"/> 626846 : Replacement Li-ion battery pack |
| <input type="checkbox"/> 603075 : Large, soft-sided carrying case | <input type="checkbox"/> 626969* : ProDSS USB flash drive |
| <input type="checkbox"/> 626945 : Small, hard-sided carrying case (1 and 4 meter) | <input type="checkbox"/> 626991* : USB cable for charging and PC connection |
| <input type="checkbox"/> 599080 : Flow cell | <input type="checkbox"/> 626992* : Cable for connection to USB stick |
| <input type="checkbox"/> 603056 : Flow cell mounting spike | <input type="checkbox"/> 626990** : Cable maintenance kit |
| <input type="checkbox"/> 063507 : Tripod | <input type="checkbox"/> 626919** : Probe guard kit |
| <input type="checkbox"/> 063517 : Ultra clamp | <input type="checkbox"/> 599786** : Calibration/storage cup |
| <input type="checkbox"/> 603070 : Shoulder strap | <input type="checkbox"/> 603062*** : Cable management kit |
| <input type="checkbox"/> 603069 : Belt clip | <input type="checkbox"/> 626918**** : 1 lb weight |
| <input type="checkbox"/> 626942 : USB car charger | <input type="checkbox"/> 605978 : 4.9 oz weight |
| <input type="checkbox"/> 626943 : Small external battery pack. Will typically recharge battery to ~50% when completely discharged | |
| <input type="checkbox"/> 626944 : Large external battery pack. Will typically recharge battery and charge second battery to ~20% | |
| <input type="checkbox"/> 626940* : AC charger (USA). Includes power supply and USB cable (626991) | |
| <input type="checkbox"/> 626941* : AC charger (International). Includes power supply, USB cable and outlet adapters | |

*Included with new ProDSS. Only one (1) AC charger is included based on region **Included with all cables

Included with all 10, 20, and 30 meter cables *Included with all cables 10 meters and longer



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Specifications are subject to change. Please visit YSI.com to verify all specs.
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Be Right™

SAFETY DATA SHEET

Issue Date 19-Jun-2017

Revision Date 29-Jan-2018

Version 1.1

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1. IDENTIFICATION

Product identifier

Product Name Fluoride Vial Test

Other means of identification

Product Code(s) TNT878

Safety data sheet number M03316

UN/ID no 3316

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory reagent.

Uses advised against None.

Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

Emergency telephone number

+1(303) 623-5716 - 24 Hour Service +1(515)232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1
Respiratory sensitization	
Skin sensitization	
Mutagenicity	
Carcinogenicity	
Reproductive toxicity	
Specific target organ toxicity (repeated exposure)	

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Signal word - Danger

Product Code(s) TNT878
Issue Date 19-Jun-2017
Version 1.1

Product Name Fluoride Vial Test
Revision Date 29-Jan-2018
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Hazard statements

H314 - Causes severe skin burns and eye damage

Precautionary statements

P260 - Do not breathe dusts or mists
P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P363 - Wash contaminated clothing before reuse
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P405 - Store locked up
P501 - Dispose of contents/ container to an approved waste disposal plant
P280 - Wear eye protection/ face protection
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/physician

Other Hazards Known

Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Hydrochloric acid	7647-01-0	5 - 10%	-
Zirconium oxychloride	7699-43-6	<0.01%	-

4. FIRST AID MEASURES

Description of first aid measures

General advice	Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.
Inhalation	Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical advice/attention.
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical advice/attention.
Ingestion	Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Get immediate medical advice/attention.
Self-protection of the first aider	Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.

Most important symptoms and effects, both acute and delayed

Symptoms	Burning sensation.
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Indication of any immediate medical attention and special treatment needed

Note to physicians	Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure.
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5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable Extinguishing Media	Caution: Use of water spray when fighting fire may be inefficient.
Specific hazards arising from the chemical	The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors.
Hazardous combustion products	No information available.
Special protective equipment for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice	Only persons properly qualified to respond to an emergency involving hazardous
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substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

Personal precautions, protective equipment and emergency procedures

Personal precautions Attention! Corrosive material. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

Reference to other sections See section 8 for more information. See section 13 for more information.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Store locked up. Keep out of the reach of children. Store away from other materials.

Flammability class Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Hydrochloric acid CAS#: 7647-01-0	Ceiling: 2 ppm	(vacated) Ceiling: 5 ppm (vacated) Ceiling: 7 mg/m ³ Ceiling: 5 ppm Ceiling: 7 mg/m ³	IDLH: 50 ppm Ceiling: 5 ppm Ceiling: 7 mg/m ³

Zirconium oxychloride CAS#: 7699-43-6	STEL: 10 mg/m ³ TWA: 5 mg/m ³	TWA: 5 mg/m ³ (vacated) TWA: 5 mg/m ³ (vacated) STEL: 10 mg/m ³	IDLH: 25 mg/m ³ Zr TWA: 5 mg/m ³ except Zirconium tetrachloride Zr STEL: 10 mg/m ³ Zr
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Appropriate engineering controls

Engineering Controls

Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Respiratory protection

No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection

Wear suitable gloves. Impervious gloves.

Eye/face protection

Face protection shield.

Skin and body protection

Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

General Hygiene Considerations

Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product.

Environmental exposure controls

Local authorities should be advised if significant spillages cannot be contained. Do not allow into any sewer, on the ground or into any body of water.

Thermal hazards

None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

No information available

Appearance

aqueous solution

Color

No information available

Odor

No information available

Odor threshold

No data available

Property

Values

Remarks • Method

Molecular weight

No data available

pH

< 0.5

Melting point/freezing point

No data available

Boiling point / boiling range

No data available

Evaporation rate

No data available

Vapor pressure

No data available

Vapor density (air = 1)

No data available

Specific gravity (water = 1 / air = 1)

No data available

Partition Coefficient (n-octanol/water)

No data available

Soil Organic Carbon-Water Partition

No data available

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Coefficient

Autoignition temperature No data available
Decomposition temperature No data available
Dynamic viscosity No data available
Kinematic viscosity No data available

Solubility(ies)

Water solubility

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
No information available	No data available	No information available

Solubility in other solvents

<u>Chemical Name</u>	<u>Solubility classification</u>	<u>Solubility</u>	<u>Solubility Temperature</u>
None reported	No information available	No data available	No information available

Other Information

Metal Corrosivity

Steel Corrosion Rate No data available
Aluminum Corrosion Rate No data available

Volatile Organic Compounds (VOC) Content

Chemical name	CAS No.	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Hydrochloric acid	7647-01-0	Not applicable	-
Zirconium oxychloride	7699-43-6	No data available	-

Explosive properties

Upper explosion limit No data available
Lower explosion limit No data available

Flammable properties

Flash point No data available

Flammability Limit in Air

Upper flammability limit: No data available
Lower flammability limit: No data available

Oxidizing properties

No data available.

Bulk density

No data available

Particle Size

No information available

Particle Size Distribution

No information available

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None

Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization

None under normal processing.

Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods.

Incompatible materials

Incompatible materials Acids. Bases. Oxidizing agent.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation

Specific test data for the substance or mixture is not available. Corrosive by inhalation. (based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal.

Eye contact

Specific test data for the substance or mixture is not available. Causes burns. (based on components). Corrosive to the eyes and may cause severe damage including blindness. Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact

Specific test data for the substance or mixture is not available. May cause irritation.

Ingestion

Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways.

Symptoms

Redness. Burning. May cause blindness. Coughing and/ or wheezing.

Aggravated Medical Conditions

Eye disorders. Skin disorders. Respiratory disorders.

Toxicologically synergistic

None known.

products

Toxicokinetics, metabolism and

distribution

See ingredients information below.

Chemical name	Toxicokinetics, metabolism and distribution
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Low concentrations of hydrochloric acid solution do not seem to cause adverse effects to animals and its corrosivity may be greatly attributed to any acute deaths, therefore it is not classified for acute toxicity.

Product Acute Toxicity Data

Oral Exposure Route	No data available
Dermal Exposure Route	No data available
Inhalation (Dust/Mist) Exposure Route	No data available
Inhalation (Vapor) Exposure Route	No data available
Inhalation (Gas) Exposure Route	No data available

Acute Toxicity Estimations (ATE)

ATEmix (oral)	No information available
ATEmix (dermal)	No information available
ATEmix (inhalation-dust/mist)	No information available
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Ingredient Acute Toxicity Data

Oral Exposure Route						If available, see data below
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data	
Zirconium oxychloride (<0.01%) CAS#: 7699-43-6	Rat LD ₅₀	2950 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)	
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Rat LD ₅₀	234 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)	

Dermal Exposure Route						If available, see data below
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data	
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Rabbit LD ₅₀	> 5010 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)	

Inhalation (Dust/Mist) Exposure Route						If available, see data below
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data	
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	None reported	None reported	None reported	None reported	No information available	

Inhalation (Vapor) Exposure Route						If available, see data below
Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data	
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Rat LC ₅₀	16.8 mg/L	4 hours	None reported	IUCLID (The International Uniform Chemical Information Database)	

Inhalation (Gas) Exposure Route	If available, see data below
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Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route	No data available
Dermal Exposure Route	No data available
Inhalation (Dust/Mist) Exposure Route	No data available

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Inhalation (Vapor) Exposure Route
 Inhalation (Gas) Exposure Route

No data available
 No data available

Ingredient Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Man LD _{Lo}	2.857 mg/kg	None reported	Vascular BP lowering not characterized in autonomic section Lungs, Thorax, or Respiration Respiratory depression Gastrointestinal Other changes	RTECS (Registry of Toxic Effects of Chemical Substances)

Dermal Exposure Route

If available, see data below

Inhalation (Dust/Mist) Exposure Route

If available, see data below

Inhalation (Vapor) Exposure Route

If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Human TC _{Lo}	0.05 mg/L	None reported	Lungs, Thorax, or Respiration Cough	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Gas) Exposure Route

If available, see data below

Aspiration toxicity

No data available

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Existing human experience	Human	None reported	None reported	Corrosive to skin	RTECS (Registry of Toxic Effects of Chemical Substances)

Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Existing human experience	Human	None reported	None reported	Corrosive to eyes	No information available

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route
 Respiratory Sensitization Exposure Route

No data available.
 No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route

If available, see data below.

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Respiratory Sensitization Exposure Route

If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose Data

Oral Exposure Route No data available.
 Dermal Exposure Route No data available.
 Inhalation (Dust/Mist) Exposure Route No data available.
 Inhalation (Vapor) Exposure Route No data available.
 Inhalation (Gas) Exposure Route No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route If available, see data below
 Dermal Exposure Route If available, see data below
 Inhalation (Dust/Mist) Exposure Route If available, see data below
 Inhalation (Vapor) Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Rat TC _{Lo}	0.000685 mg/L	84 days	Behavioral Muscle contraction or spasticity Biochemical Enzyme inhibition, induction, or change in blood or tissue levels (true cholinesterase) Kidney, Ureter, or Bladder Other changes in urine composition	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Gas) Exposure Route

If available, see data below

Product Carcinogenicity Data

Oral Exposure Route No data available
 Dermal Exposure Route No data available
 Inhalation (Dust/Mist) Exposure Route No data available
 Inhalation (Vapor) Exposure Route No data available
 Inhalation (Gas) Exposure Route No data available

Ingredient Carcinogenicity Data

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Hydrochloric acid	7647-01-0	-	Group 3	-	X
Zirconium oxychloride	7699-43-6	-	-	-	-

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Group 3 - Not classifiable as a human carcinogen
NTP (National Toxicology Program)	Does not apply
OSHA (Occupational Safety and Health Administration of the US Department of Labor)	X - Present

Oral Exposure Route If available, see data below
 Dermal Exposure Route If available, see data below
 Inhalation (Dust/Mist) Exposure Route If available, see data below
 Inhalation (Vapor) Exposure Route If available, see data below
 Inhalation (Gas) Exposure Route If available, see data below

Product Germ Cell Mutagenicity *invitro* Data

No data available.

Ingredient Germ Cell Mutagenicity *invitro* Data

If available, see data below

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Cytogenetic analysis	Hamster lung	30 mmol/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)
Zirconium oxychloride (<0.01%) CAS#: 7699-43-6	Mutation in microorganisms	<i>Salmonella typhimurium</i>	None reported	None reported	Negative test result for mutagenicity	HSDB (Hazardous Substances Data Bank)
Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Cytogenetic analysis	Hamster ovary	8 mmol/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

Product Germ Cell Mutagenicity *in vivo* Data

Oral Exposure Route No data available
 Dermal Exposure Route No data available
 Inhalation (Dust/Mist) Exposure Route No data available
 Inhalation (Vapor) Exposure Route No data available
 Inhalation (Gas) Exposure Route No data available

Ingredient Germ Cell Mutagenicity *in vivo* Data

Oral Exposure Route If available, see data below
 Dermal Exposure Route If available, see data below
 Inhalation (Dust/Mist) Exposure Route If available, see data below
 Inhalation (Vapor) Exposure Route If available, see data below
 Inhalation (Gas) Exposure Route If available, see data below

Product Reproductive Toxicity Data

Oral Exposure Route No data available
 Dermal Exposure Route No data available
 Inhalation (Dust/Mist) Exposure Route No data available
 Inhalation (Vapor) Exposure Route No data available
 Inhalation (Gas) Exposure Route No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route If available, see data below
 Inhalation (Dust/Mist) Exposure Route If available, see data below

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Rat TC _{Lo}	0.450 mg/L	1 hours	Effects on Embryo or Fetus Fetotoxicity (except death e.g. stunted fetus) Specific Developmental Abnormalities Homeostasis	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Vapor) Exposure Route If available, see data below
 Inhalation (Gas) Exposure Route If available, see data below

12. ECOLOGICAL INFORMATION

Ecotoxicity

Product Ecological Data

Aquatic toxicity

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Fish No data available
Crustacea No data available
Algae No data available

Ingredient Ecological Data

Aquatic toxicity

Fish If available, see ingredient data below
Crustacea If available, see ingredient data below
Algae No data available

Other Information

Persistence and degradability

Product Biodegradability Data
If available, see ingredient data below.

Ingredient Biodegradability Data

Test data reported below

Chemical name	Test method	Biodegradation	Exposure time	Results
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	None reported	None reported	None reported	Readily biodegradable

Bioaccumulation

Product Bioaccumulation Data
If available, see ingredient data below.

Partition Coefficient (n-octanol/water) No data available

Ingredient Bioaccumulation Data

Chemical name	Test method	Exposure time	Species	Bioconcentration factor (BCF)	Results
Zirconium oxychloride (<0.01%) CAS#: 7699-43-6	None reported	None reported	None reported	None reported	Does not have the potential to bioaccumulate

Mobility

Soil Organic Carbon-Water Partition Coefficient No data available

Water solubility

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
No information available	No data available	No information available

Other adverse effects
No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products	Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.
Contaminated packaging	Do not reuse empty containers.
US EPA Waste Number	D002

14. TRANSPORT INFORMATION

U.S. DOT

UN/ID no	3316
Proper shipping name	Chemical kits
Hazard Class	9
Packing Group	II
Emergency Response Guide Number	171

TDG

UN/ID no	3316
Proper shipping name	Chemical kits
Hazard Class	9
Packing Group	II

IATA

UN/ID no	3316
Proper shipping name	Chemical kits
Hazard Class	9
Packing Group	II
ERG Code	171

IMDG

UN/ID no	3316
Proper shipping name	Chemical kits
Hazard Class	9
Packing Group	II

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is not in a reagent set or kit, the classification given above applies. If the item is part of a reagent set or kit the classification would change to the following: UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III. If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories

TSCA	Complies
DSL/NDSL	Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

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EINECS/ELINCS	Complies
ENCS	Does not comply
IECSC	Complies
KECL	Does not comply
PICCS	Complies
TCSI	Complies
AICS	Complies
NZIoC	Does not comply

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	SARA 313 - Threshold Values %
Hydrochloric acid (CAS #: 7647-01-0)	1.0

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic Health Hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Hydrochloric acid 7647-01-0	5000 lb	-	-	X

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Hydrochloric acid 7647-01-0	5000 lb	5000 lb	RQ 5000 lb final RQ RQ 2270 kg final RQ

U.S. - Department of Homeland Security - Chemical Facility Anti-Terrorism Standards (CFATS) - Security Issues

Chemical name	U.S. - Department of Homeland Security - Chemical Facility Anti-Terrorism Standards (CFATS) - Security Issues
Hydrochloric acid (5 - 10%)	Release - Toxic (concentration >=37%); Release - Toxic (anhydrous); Theft - Weapons of Mass Effect (anhydrous)

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CAS#: 7647-01-0

U.S. - DEA (Drug Enforcement Administration) List I & List II

Chemical name	U.S. - DEA (Drug Enforcement Administration) - List I or Precursor Chemicals	U.S. - DEA (Drug Enforcement Administration) - List II or Essential Chemicals
Hydrochloric acid (5 - 10%) CAS#: 7647-01-0	Not Listed	0.0 kg Domestic Sales Weight (listed under anhydrous Hydrogen chloride); 50 gallon Export Volume (exports, transshipments and international transactions to designated countries); 27 kg Export Weight (exports, transshipments and international transactions to designated countries, listed under anhydrous Hydrogen chloride)

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Hydrochloric acid 7647-01-0	X	X	X
Zirconium oxychloride 7699-43-6	-	X	-

U.S. EPA Label Information

Chemical name	FIFRA	FDA
Hydrochloric acid	180.0910	21 CFR 182.1057

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

None

Additional information

Global Automotive Declarable Substance List (GADSL)

Not applicable

NFPA and HMIS Classifications

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and Chemical Properties -
HMIS	Health hazards - 3	Flammability - 0	Physical Hazards - 0	Personal protection - X - See section 8 for more information

Key or legend to abbreviations and acronyms used in the safety data sheet

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NIOSH IDLH
ACGIH
NDF

Immediately Dangerous to Life or Health
ACGIH (American Conference of Governmental Industrial Hygienists)
no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
MAC	Maximum Allowable Concentration	Ceiling	Ceiling Limit Value
X	Listed	Vacated	These values have no official status. The only binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.
SKN*	Skin designation	SKN+	Skin sensitization
RSP+	Respiratory sensitization	**	Hazard Designation
C	Carcinogen	R	Reproductive toxicant
M	mutagen		

Prepared By Hach Product Compliance Department

Issue Date 19-Jun-2017

Revision Date 29-Jan-2018

Revision Note None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

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End of Safety Data Sheet