



ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PLAN

Town of Eastham

September 2021

ENVIRONMENTAL
 **PARTNERS**

— An Apex Company —

TABLE OF CONTENTS

| | |
|---|----------|
| LIST OF TABLES | 3 |
| LIST OF FIGURES | 4 |
| LIST OF APPENDICIES | 5 |
| SECTION 1 INTRODUCTION | 1 |
| SECTION 1.1 MS4 PROGRAM..... | 1 |
| SECTION 1.2 ILLICIT DISCHARGES..... | 1 |
| SECTION 1.3 ALLOWABLE NON-STORMWATER DISCHARGES | 2 |
| SECTION 1.4 RECEIVING WATERS AND IMPAIRMENTS | 3 |
| SECTION 1.5 IDDE PROGRAM GOALS, FRAMEWORK, AND TIMELINE..... | 4 |
| SECTION 1.6 WORK COMPLETED UNDER THE 2003 MS4 PERMIT | 5 |
| SECTION 2 AUTHORITY AND STATEMENT OF IDDE RESPONSIBILITIES..... | 6 |
| SECTION 2.1 LEGAL AUTHORITY | 6 |
| SECTION 2.2 STATEMENT OF RESPONSIBILITIES | 6 |
| SECTION 3 STORMWATER SYSTEM MAPPING..... | 7 |
| SECTION 3.1 PHASE I MAPPING | 7 |
| SECTION 3.2 PHASE II MAPPING | 8 |
| SECTION 3.3 ADDITIONAL RECOMMENDED MAPPING ELEMENTS..... | 8 |
| SECTION 4 SANITARY SEWER OVERFLOWS (SSOS)..... | 9 |
| SECTION 5 ASSESSMENT AND PRIORITY RANKING OF OUTFALLS | 0 |
| SECTION 5.1 OUTFALL CATCHMENT DELINEATIONS | 0 |
| SECTION 5.2 OUTFALL AND INTERCONNECTION INVENTORY AND INITIAL RANKING | 0 |
| SECTION 6 DRY WEATHER OUTFALL SCREENING AND SAMPLING..... | 2 |
| SECTION 6.1 WEATHER CONDITIONS..... | 3 |
| SECTION 6.2 DRY WEATHER SCREENING/SAMPLING PROCEDURE..... | 3 |
| <i>Section 6.2.1 General Procedure</i> | <i>3</i> |
| <i>Section 6.2.2 Field Equipment.....</i> | <i>4</i> |
| <i>Section 6.2.3 Sample Collection and Analysis</i> | <i>5</i> |
| SECTION 6.3 INTERPRETING OUTFALL SAMPLING RESULTS..... | 7 |

| | | |
|------------------|---|-----------|
| SECTION 6.4 | DRY WEATHER WORK COMPLETED TO DATE..... | 8 |
| SECTION 6.5 | FOLLOW-UP RANKING OF OUTFALLS AND INTERCONNECTIONS..... | 8 |
| SECTION 7 | CATCHMENT INVESTIGATIONS | 9 |
| SECTION 7.1 | SYSTEM VULNERABILITY FACTORS | 9 |
| SECTION 7.2 | DRY WEATHER MANHOLE INSPECTIONS | 10 |
| SECTION 7.3 | WET WEATHER OUTFALL SAMPLING | 12 |
| SECTION 7.4 | SOURCE ISOLATION AND CONFIRMATION..... | 12 |
| Section 7.4.1 | <i>Sandbagging</i> | 13 |
| Section 7.4.2 | <i>Smoke Testing</i> | 13 |
| Section 7.4.3 | <i>Dye Testing</i> | 13 |
| Section 7.4.4 | <i>CCTV/Video Inspection</i> | 14 |
| Section 7.4.5 | <i>Optical Brightener Monitoring.....</i> | 14 |
| Section 7.4.6 | <i>IDDE Canines.....</i> | 14 |
| SECTION 7.5 | ILLCIT DISCHARGE REMOVAL | 15 |
| Section 7.5.1 | <i>Confirmatory Outfall Screening.....</i> | 15 |
| SECTION 7.6 | ONGOING SCREENING | 15 |
| SECTION 8 | TRAINING..... | 15 |
| SECTION 9 | PROGRESS REPORTING | 16 |

LIST OF TABLES

- Table 1-1 Impaired Waters.....3
- Table 1-2 IDDE Program Implementation Timeline.....5
- Table 3-1 Summary of Mapped MS4 Structures8
- Table 4-1 SSO Inventory10
- Table 6-1 Field Equipment – Dry Weather Outfall Screening and Sampling4
- Table 6-2 Field Screening Parameters and Analysis Methods5
- Table 6-3 Required Analytical Methods, Detection Limits, Hold Times, and Preservatives6
- Table 6-4 Benchmark Field Measurements for Select Parameters8

LIST OF FIGURES

Figure 1-1 IDDE Investigation Procedure Framework4

LIST OF APPENDICIES

Appendix A – Legal Authority (IDDE By-law or Ordinance)

Appendix B – Stormwater System Mapping

Appendix C – Catchment Delineation Mapping and Ranking Matrix

Appendix D – Outfall Sampling Results

Appendix E – Catchment Ranking Table

Appendix F – System Vulnerability Factor (SVF) Inventory

Appendix G – Field Forms and Hyperlinks to Laboratories and Field Services Companies

Appendix H – New England Interstate Water Pollution Control Commission IDDE Manual

Appendix I – IDDE Employee Training Record

SECTION 1 INTRODUCTION

SECTION 1.1 MS4 PROGRAM

This Illicit Discharge Detection and Elimination (IDDE) Plan has been developed for The Town of Eastham to address the requirements of the United States Environmental Protection Agency's (USEPA's) 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereafter referred to as the "2016 Massachusetts MS4 Permit" or "MS4 Permit."

The 2016 Massachusetts MS4 Permit and 2020 Permit Modifications require that each permittee, or regulated community, address six Minimum Control Measures. These measures include the following:

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

Under Minimum Control Measure 3, the permittee is required to implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges. The IDDE program must also be recorded in a written (hardcopy or electronic) document. This IDDE Plan has been prepared to address this requirement. Originally, the Town published this Plan in 2019, and since then, the Town has updated the Plan as needed.

SECTION 1.2 ILLICIT DISCHARGES

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

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

Some illicit discharges are intentional, such as dumping used oil (or other pollutant) into catch basins, a resident or contractor illegally tapping a new sewer lateral into a storm drain pipe to avoid

the costs of a sewer connection fee and service, and illegal dumping of yard wastes into surface waters.

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

Elimination of some discharges may require substantial costs and efforts, such as reconfiguring a sanitary sewer connection from a municipal storm to a sanitary sewer drain. Other beneficial strategies, such as reducing dog waste, can be accomplished through public outreach in conjunction with installing dog waste bins.

Regardless of the situation, illicit discharges can contribute high levels of pollutants, such as heavy metals, toxics, oil, grease, solvents, nutrients, and pathogens to surface waters.

SECTION 1.3 ALLOWABLE NON-STORMWATER DISCHARGES

The following categories of non-stormwater discharges are allowed under the MS4 Permit unless the permittee, USEPA, or Massachusetts Department of Environmental Protection (MassDEP) identifies any category or individual discharge of non-stormwater discharge as a significant contributor of pollutants to the MS4:

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

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

SECTION 1.4 RECEIVING WATERS AND IMPAIRMENTS

Table 1-1 lists the “impaired waters” within the boundaries of Eastham’s MS4 regulated area. Impaired waters are water bodies that do not meet water quality standards for one or more designated use(s), such as recreation or aquatic habitat. The inventory is based on the Massachusetts 2016 Integrated List of Waters published by MassDEP in December 2020 and updated every two years. The first draft of this IDDE Plan, published in 2019, and the Town’s Notice of Intent (NOI), published in 2018, used the previous Massachusetts 2014 Integrated List of Waters. There are a couple changes for Eastham between the 2014 and 2016 Integrated Lists of Waters. A segment from the water body, Moll Pond, was added (Segment ID MA96355), and this water body contains impairments for harmful algal blooms. Additionally, a segment (MA96-68) from the water body, Town Cove, no longer has a fecal coliform impairment.

**Table 1-1 Impaired Waters
Eastham, Massachusetts**

| Water Body Name | Segment ID | Category | Impairment(s) | Associated Approved TMDL |
|-------------------|------------|----------|--|--------------------------|
| Rock Harbor Creek | MA96-16 | 4a | Fecal Coliform | 36772 |
| Boat Meadow River | MA96-15 | 5 | Fecal Coliform Estuarine Bioassessments | 36772 |
| Great Pond | MA96115 | 5 | Chlorophyll-a Dissolved Oxygen, Phosphorus (Total) | |
| Moll Pond | MA96355 | 5 | Harmful Algal Blooms | |
| Town Cove | MA96-68 | 5 | Estuarine Bioassessments | 36772 |

Category 4a Waters – impaired water bodies with a completed Total Maximum Daily Load (TMDL).

Category 4c Waters – impaired water bodies where the impairment is not caused by a pollutant. No TMDL required.

Category 5 Waters – impaired water bodies that require a TMDL.

“Approved TMDLs” are those that have been approved by USEPA as of the date of issuance of the Massachusetts 2016 List of Integrated Waters (December 2019).

These impairments require additional sampling in accordance with Appendix G of the MS4 Permit. The Town must sample for fecal coliform at outfalls discharging to the Rock Harbor Creek; fecal coliform at outfalls discharging to the Boat Meadow River; total phosphorus, total nitrogen, dissolved oxygen and BODs at outfalls discharging to the Great Pond; total phosphorus and total nitrogen at outfalls discharging to the Moll Pond. In addition, Boat Meadow River and Town Cove both have impairments for estuarine bioassessments. For this impairment, Appendix G of the MS4 Permit advises contacting MassDEP as the monitoring parameter.

In order to comply with the 2016 MS4 Permit Appendix H, the Town of Eastham must implement the illicit discharge program. Catchments draining to Rock Harbor Creek, Boat Meadow River, Great Pond, Moll Pond and Town Cove shall be designated either Problem Catchments or High Priority Catchments for purposes of implementing the IDDE program.

SECTION 1.5 IDDE PROGRAM GOALS, FRAMEWORK, AND TIMELINE

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

- Legal authority and regulatory mechanism to prohibit illicit discharges and enforce this prohibition
- Storm system mapping
- Inventory and ranking of outfalls
- Dry weather outfall screening
- Catchment investigations
- Identification/confirmation of illicit sources
- Illicit discharge removal
- Follow-up screening
- Employee training

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

Figure 1-1 IDDE Investigation Procedure Framework

Table 1-2 IDDE Program Implementation Timeline

| IDDE Program Requirement | Completion Date from Effective Date of Permit | | | | | |
|--|---|-----------------------------|---------------------------|---------------------------|---------------------------|----------------------------|
| | 1 Year (June 2019) | 1.5 Years (Dec. 2019) | 2 Years (June 2020) | 3 Years (June 2021) | 7 Years (June 2025) | 10 Years (June 2028) |
| Written IDDE Program Plan | X | | | | | |
| Sanitary Sewer Overflow (SSO) Inventory | X | | | | | |
| Written Catchment Investigation Procedure | | X | | | | |
| Phase I Mapping | | | X | | | |
| Phase II Mapping | | | | | | X |
| IDDE Regulatory Mechanism or By-law (if not already in place) | | | | X | | |
| Dry Weather Outfall Screening | | | | X | | |
| Follow-up Ranking of Outfalls and Interconnections | | | | X | | |
| Catchment Investigations – Problem Outfalls | | | | | X | |
| Catchment Investigations – all Problem, High and Low Priority Outfalls | | | | | | X |

SECTION 1.6 WORK COMPLETED UNDER THE 2003 MS4 PERMIT

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

The Town of Eastham has completed the following IDDE program activities consistent with the 2003 MS4 Permit requirements:

- Developed a map of outfalls and receiving waters
- Adopted an IDDE by-law or regulatory mechanism
- Developed procedures for locating illicit discharges (e.g., visual screening of outfalls for dry weather discharges, dye or smoke testing)
- Developed procedures for locating the source of the discharge
- Developed procedures for removal of the source of an illicit discharge
- Developed procedures for documenting actions and evaluating impacts on the storm sewer system subsequent to removal

In addition to the 2003 MS4 Permit requirements, the Town completed other IDDE-related activities prior to the 2016 MS4 Permit:

- Outfall sampling
- Additional storm system mapping, including the locations of catch basins, manholes and pipe connectivity

SECTION 2 AUTHORITY AND STATEMENT OF IDDE RESPONSIBILITIES

SECTION 2.1 LEGAL AUTHORITY

The Town of Eastham has adopted Chapter 246: Stormwater Management (May 18, 2020). A copy of the Stormwater Management By-law is provided in **Appendix A**. The Stormwater Management By-law provides the Town of Eastham with adequate legal authority to:

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

The Town of Eastham is in the process of reviewing its current Stormwater Management By-Law and related land use regulations and policies for consistency with the 2016 MS4 Permit and 2020 Permit Modifications.

SECTION 2.2 STATEMENT OF RESPONSIBILITIES

The Eastham Department of Public Works is the lead municipal agency responsible for implementing the IDDE program pursuant to the provisions of the Illicit Discharges to Storm Drainage System. Other agencies or departments with responsibility for aspects of the program include:

- Town Administrator – Jacqueline Beebe
- Board of Health – Jane Crowley (Director of Health and Environment)
- Department of Public Works – Silvio Genao, PE (DPW Director)
- Police Department – Adam Bohannon (Chief of Police)
- Conservation Committee – Charles Katuska (Conservation Agent)
- Water Management Committee – Jane Crowley (Director of Health and Environment)
- Planning Department – Paul Lagg (Town Planner)
- Zoning Board of Appeals – Paul Lagg (Community Development Director)
- Natural Resources – Mike O'Connor (Natural Resources Officer)
- Pond and Lake Stewards (PALS) – Jane Crowley (Director of Health and Environment)

SECTION 3 STORMWATER SYSTEM MAPPING

The Town of Eastham originally developed mapping of its stormwater system to meet the mapping requirements of the 2003 MS4 Permit. The 2016 MS4 Permit requires a more detailed storm system map than was required by the 2003 MS4 Permit. The revised mapping is intended to facilitate the identification of key infrastructure, factors influencing proper system operation, and the potential for illicit discharges.

The 2016 MS4 Permit requires the storm system map to be updated in two phases as outlined below. The Department of Public Works is responsible for updating the stormwater system mapping pursuant to the 2016 MS4 Permit. The Town of Eastham reports on the progress towards completion of the storm system map in each annual report. Updates to the stormwater mapping are included in **Appendix B**.

SECTION 3.1 PHASE I MAPPING

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

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

The Town of Eastham has completed the following updates to its stormwater mapping to meet the Phase I requirements:

- Outfalls and receiving waters (*updated 2016*)
- Water bodies identified by name and indication of all use impairments as identified on the most recent USEPA approved Massachusetts Integrated List of Waters report (*taken from USGS/MassDEP Hydrography data updated April 2017*)
- Initial catchment delineations. Any available system data and topographic information may be used to produce initial catchment delineations (*attached as Attachment D*)
- Interconnections with other MS4s and other storm sewer systems
- Open channel conveyances (*updated 2019*)
- Municipally owned stormwater treatment structures (*updated 2021*)

The following table contains information regarding the total number of drainage structures mapped within the MS4 Urbanized Area in Eastham. It has been compiled using data collected by the Town. A

complete stormwater system mapbook is included in the Marshfield Operations and Maintenance (O&M) Plan as Attachment 1.

Table 3-1 Summary of Mapped MS4 Structures

| Structure Type | Number of Structures |
|-----------------------|-----------------------------|
| Outfalls | 4 |
| Catch Basins | 813 |
| Drain Manholes | 60 |
| Pipes | 232 |
| BMPs | 17 |
| Inlets | 2 |
| Culverts | 1 |

SECTION 3.2 PHASE II MAPPING

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

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

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

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

SECTION 3.3 ADDITIONAL RECOMMENDED MAPPING ELEMENTS

Although not a requirement of the 2016 MS4 Permit, the Town of Eastham will consider the following recommended elements in its storm system mapping:

- Storm sewer material, size (pipe diameter), age
- Sanitary sewer system material, size (pipe diameter), age (if/when applicable)
- Privately owned stormwater treatment structures
- Area where the permittee's MS4 has received or could receive flow from septic system discharges
- Seasonal high water table elevations impacting sanitary alignments
- Topography
- Orthophotography
- Alignments, dates and representation of work completed of past illicit discharge investigations
- Locations of suspected confirmed and corrected illicit discharges with dates and flow estimates

SECTION 4 SANITARY SEWER OVERFLOWS (SSOs)

The 2016 MS4 Permit requires municipalities to prohibit illicit discharges, including sanitary sewer overflows (SSOs), to the separate storm sewer system. SSOs are discharges of untreated sanitary wastewater from a municipal sanitary sewer that can contaminate surface waters, cause serious water quality problems and property damage, and threaten public health. SSOs can be caused by blockages, line breaks, sewer defects that allow stormwater and groundwater to overload the system, power failures, improper sewer design, and vandalism.

As of September 2021, the Town of Eastham does not have a municipal sewer system. The Town has completed an inventory of SSOs that have discharged to the MS4 within the five (5) years prior to the effective date of the 2016 MS4 Permit, based on review of available documentation pertaining to SSOs. The inventory included all SSOs that occurred during wet or dry weather resulting from inadequate conveyance capacities or where interconnectivity of the storm and sanitary sewer infrastructure allows for transfer of flow between systems. Between June 2019 and September 2021, there have been no known SSOs from septic systems in the Town of Eastham. **Table 4-1** is provided below as reference for future use, if necessary.

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

The inventory in **Table 4-1** will be updated by the Board of Health when new SSOs are detected. The SSO inventory will be included in the annual report, including the status of mitigation and corrective measures to address each identified SSO.

**Table 4-1 SSO Inventory
 Eastham, Massachusetts
 Revision Date: September 2021**

| SSO Location¹ | Discharge Statement² | Date³ | Time Start³ | Time End³ | Estimated Volume⁴ | Description⁵ | Mitigation Completed⁶ | Mitigation Planned⁷ |
|---------------------------------|--|-------------------------|-------------------------------|-----------------------------|-------------------------------------|--------------------------------|---|---------------------------------------|
| None | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹ Location (approximate street crossing/address and receiving water, if any)
² A clear statement of whether the discharge entered a surface water directly or entered the MS4
³ Date(s) and time(s) of each known SSO occurrence (i.e., beginning and end of any known discharge)
⁴ Estimated volume(s) of the occurrence
⁵ Description of the occurrence indicating known or suspected cause(s)
⁶ Mitigation and corrective measures completed with dates implemented
⁷ Mitigation and corrective measures planned with implementation schedules

SECTION 5 ASSESSMENT AND PRIORITY RANKING OF OUTFALLS

The 2016 MS4 Permit requires an assessment and priority ranking of outfalls in terms of their potential to contain illicit discharges and SSOs. The ranking helps determine the priority order for performing IDDE investigations and meeting permit milestones.

SECTION 5.1 OUTFALL CATCHMENT DELINEATIONS

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

SECTION 5.2 OUTFALL AND INTERCONNECTION INVENTORY AND INITIAL RANKING

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

The outfall and interconnection inventory identifies each outfall and interconnection discharging from the MS4, records the structure location and condition, and provides a framework for tracking inspections, screenings, and other IDDE program activities.

Outfalls and interconnections are classified into one of the following categories:

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

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

Eastham has no Problem Outfalls

2. High Priority Outfalls: Outfalls/interconnections that have not been classified as Problem Outfalls and that are:

- Discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds
- Determined by the permittee as high priority based on the characteristics listed below or other available information

Eastham has 3 High Priority Outfalls

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

Eastham has 1 Low Priority Outfalls

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

Eastham has no Excluded Outfalls

Outfalls are ranked into the above priority categories (except for excluded outfalls, which are excluded from the IDDE program) based on the following characteristics of the defined initial catchment areas, where information is available. Additional relevant characteristics, including location-specific characteristics, may be considered but must be documented in this IDDE Plan. The initial ranking was based upon response provided by the Town of Marshfield in May 2019. The initial characteristics considered include:

- **Previous screening results** – Previous screening/sampling results indicate likely sewer input (see criteria above for Problem Outfalls).
 - None received.
- **Past discharge complaints and reports**
 - None received.
- **Poor receiving water quality** – The following guidelines are recommended to identify waters as having a high illicit discharge potential:
 - Exceeding water quality standards for bacteria,
 - Ammonia levels above 0.5 mg/L, or
 - Surfactants levels greater than or equal to 0.25 mg/L.
 - Great Pond (Category 5 – Phosphorus)

- Unnamed Wetlands to Town Cove (Category 5 – Fecal Coliform)
 - Boat Meadow River (Category 5 - Fecal Coliform)
- **Density of generating sites** – Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.
 - None within catchments with MS4 outfalls.
- **Age of development and infrastructure** – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old may have a high illicit discharge potential. Developments 20 years or younger may have a low illicit discharge potential.
 - Not applicable – Town has no sanitary sewer systems.
- **Sewer conversion** – Contributing catchment areas that were once serviced by septic systems, but have since been converted to sewer connections may have a high illicit discharge potential.
 - Not applicable – Town has no sanitary sewer systems.
- **Historic combined sewer systems** – Contributing areas that were once serviced by a combined sewer system, but have since been separated may have a high illicit discharge potential.
 - Not applicable – Town has no sanitary sewer systems.
- **Surrounding density of aging septic systems** – Septic systems 30 years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
 - Three (3) updated septic systems reported within catchments with MS4 outfalls.
- **Culverted streams** – Any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
 - None reported.
- **Water quality limited water bodies** – Impaired waters and/or waters with approved TMDL(s) that receive discharge from the MS4 have a high illicit discharge potential if the discharges could contain the pollutant identified as the cause of the water quality impairment.
 - Impaired water bodies are listed in **Table 1-1**.

The Town has updated the initial outfall priority ranking matrix based on screening and sampling completed since the initial ranking was developed. The screening and sampling and updates to the ranking table are discussed further in **Section 6.4** and **Section 6.5**. The updated outfall priority ranking matrix and catchment delineation mapping is included in **Appendix C**.

SECTION 6 DRY WEATHER OUTFALL SCREENING AND SAMPLING

Dry weather flow is a common indicator of potential illicit connections. The MS4 Permit requires all outfalls/interconnections (excluding Excluded Outfalls) to be inspected for the presence of dry weather flow. The Department of Public Works, or hired representatives, are responsible for

conducting dry weather outfall screening, starting with High Priority outfalls, followed by Low Priority outfalls, based on the initial priority rankings described in the previous section.

SECTION 6.1 WEATHER CONDITIONS

Dry weather outfall screening and sampling may occur when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring. For purposes of determining dry weather conditions, program staff will use precipitation data from the Our Lady of the Valley Station (Station ID KMAEASTH45) If this station is not available or not reporting current weather data, then the West Street Weather Station (Station ID KMAEASTH27) will be used as a back-up.

SECTION 6.2 DRY WEATHER SCREENING/SAMPLING PROCEDURE

Section 6.2.1 General Procedure

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

1. Identify outfall(s) to be screened/sampled based on initial outfall inventory and priority ranking.
2. Acquire the necessary staff, mapping, and field equipment (see **Table 6-1** for list of potential field equipment).
3. Conduct the outfall inspection during dry weather:
 - a. Mark and photograph the outfall.
 - b. Record the inspection information and outfall characteristics (using paper forms or digital form using a tablet or similar device) (see form in **Appendix G**).
 - c. Look for and record visual/olfactory evidence of pollutants in flowing outfalls including odor, color, turbidity, and floatable matter (suds, bubbles, excrement, toilet paper, or sanitary products). Also, observe outfalls for deposits and stains, vegetation, and damage to outfall structures.
4. If flow is observed, sample and test the flow following the procedures described in the following sections.
5. If no flow is observed, but evidence of illicit flow exists (illicit discharges are often intermittent or transitory), revisit the outfall during dry weather within one week of the initial observation, if practicable, to perform a second dry weather screening and sample any observed flow. Other techniques can be used to detect intermittent or transitory flows including conducting inspections during evenings or weekends and using optical brighteners.
6. Input results from screening and sampling into spreadsheet/database. Include pertinent information in the outfall/interconnection inventory and priority ranking.
7. Include all screening data in the annual report.

Previous outfall screening/sampling conducted under the 2003 MS4 Permit may be used to satisfy the dry weather outfall/screening requirements of the 2016 MS4 Permit only if the previous screening and sampling was substantially equivalent to that required by the 2016 MS4 Permit, including the list of analytes outlined in Section 2.3.4.7.b.iii.4 of the 2016 permit.

Section 6.2.2 Field Equipment

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

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

| Equipment | Use/Notes |
|-------------------------------------|---|
| Clipboard | For organization of field sheets and writing surface |
| Field Sheets | Field sheets for both dry weather inspection and dry weather sampling should be available with extras |
| Chain of Custody Forms | To ensure proper handling of all samples |
| Pens/Pencils/Permanent Markers | For proper labeling |
| Nitrile Gloves | To protect the sampler as well as the sample from contamination |
| Flashlight/headlamp with Batteries | For looking in outfalls or manholes, helpful in early mornings as well |
| Cooler with Ice | For transporting samples to the laboratory |
| Digital Camera | For documenting field conditions at time of inspection |
| Personal Protective Equipment (PPE) | Reflective vest, safety glasses, and boots at a minimum |
| GPS Receiver | For taking spatial location data |
| Water Quality Sonde | If needed, for sampling conductivity, temperature, pH |
| Water Quality Meter | Hand held meter, if available, for testing for various water quality parameters such as ammonia, surfactants, and chlorine |
| 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 (e.g., bacteria requires sterile containers) |
| Pry Bar or Pick | For opening catch basins and manholes when necessary |
| Sandbags | For damming low flows in order to take samples |
| Small Mallet or Hammer | Helping to free stuck manhole and catch basin covers |
| Utility Knife | Multiple uses |
| Measuring Tape | Measuring distances and depth of flow |
| Safety Cones | Safety |
| Hand Sanitizer | Disinfectant/decontaminant |
| Zip Ties/Duct Tape | For making field repairs |
| Rubber Boots/Waders | For accessing shallow streams/areas |
| Sampling Pole/Dipper/Sampling Cage | For accessing hard to reach outfalls and manholes |

Section 6.2.3 Sample Collection and Analysis

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

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

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

Field test kits or field instrumentation are permitted for all parameters except indicator bacteria and any pollutants of concern. Field kits need to have appropriate detection limits and ranges. **Table 6-2** lists various field test kits and field instruments that can be used for outfall sampling associated with the 2016 MS4 Permit parameters, other than indicator bacteria and any pollutants of concern.

Table 6-2 Field Screening Parameters and Analysis Methods

| Analyte or Parameter | Instrumentation (Portable Meter) | Field Test Kit |
|--------------------------|--|---|
| Ammonia | CHEMetrics™ V-2000 Colorimeter Hach™ DR/890 Colorimeter Hach™ Pocket Colorimeter™ II | CHEMetrics™ K-1410 CHEMetrics™ K-1510 (series) Hach™ NI-SA Hach™ Ammonia Test Strips |
| Surfactants (Detergents) | CHEMetrics™ I-2017 | CHEMetrics™ K-9400 and K-9404 Hach™ DE-2 |
| Chlorine | CHEMetrics™ V-2000, K-2513 Hach™ Pocket Colorimeter™ II | NA |

| Analyte or Parameter | Instrumentation (Portable Meter) | Field Test Kit |
|----------------------|---|----------------|
| Conductivity | CHEMetrics™ I-1200 YSI Pro30 YSI EC300A Oakton 450 | NA |
| Temperature | YSI Pro30 YSI EC300A Oakton 450 | NA |
| Salinity | YSI Pro30 YSI EC300A Oakton 450 | NA |
| Dissolved Oxygen | YSI Pro30 YSI EC300A Oakton 450 | NA |
| Turbidity | Hach™ 2100Q Portable Turbidimeter Oakton CON 150 | NA |

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

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

Table 6-3 Required Analytical Methods, Detection Limits, Hold Times, and Preservatives

| Analyte or Parameter | Analytical Method | Detection Limit | Max. Hold Time | Preservative |
|----------------------|---|-----------------|---------------------------------|---|
| Ammonia | EPA: 350.2 SM: 4500-NH3C | 0.05 mg/L | 28 days | Cool ≤6°C, H ₂ SO ₄ to pH <2, No preservative required if analyzed immediately |
| Surfactants | SM: 5540-C | 0.01 mg/L | 48 hours | Cool ≤6°C |
| Chlorine | SM: 4500-Cl G | 0.02 mg/L | Analyze within 15 minutes | None Required |
| Temperature | SM: 2550B | NA | Immediate | None Required |
| Specific Conductance | EPA: 120.1 SM: 2510B | 0.2 µs/cm | 28 days | Cool ≤6°C |
| Salinity | SM: 2520 | - | 28 days | Cool ≤6°C |

| Analyte or Parameter | Analytical Method | Detection Limit | Max. Hold Time | Preservative |
|--|---|--|----------------|---|
| Biochemical Oxygen Demand (BOD) | EPA: 360.1 | EPA: 3 mg/L | 48 hours | Cool ≤6°C |
| Dissolved Oxygen | EPA: 365.1 | EPA: 1 mg/L | Immediate | Cool ≤6°C |
| Turbidity | EPA: 160.2 | EPA: 1 NTU | 48 hours | Cool ≤6°C |
| Indicator Bacteria: <i>E.coli</i> <i>Enterococcus</i> <i>Fecal Coliform</i> | <i>E.coli</i> EPA: 1603 SM: 9221B, 9221F, 9223 B Other: Colilert®, Colilert-18®, <i>Enterococcus</i> EPA: 1600 SM: 9230 C Other: Enterolert®, <i>Fecal Coliform</i> EPA: 1680 | <i>E.coli</i> EPA: 1 cfu/100mL SM: 2 MPN/100mL Other: 1 MPN/100mL <i>Enterococcus</i> EPA: 1 cfu/100mL SM: 1 MPN/100mL Other: 1 MPN/100mL <i>Fecal Coliform</i> EPA: 1 ctu | 8 hours | Cool ≤10°C, 0.0008% Na ₂ S ₂ O ₃ |
| Total Phosphorus | EPA: Manual-365.3, Automated Ascorbic acid digestion-365.1 Rev. 2, ICP/AES4-200.7 Rev. 4.4 SM: 4500-P E-F | EPA: 0.01 mg/L SM : 0.01 mg/L | 28 days | Cool ≤6°C, H ₂ SO ₄ to pH <2 |
| Total Nitrogen (Ammonia + Nitrate/Nitrite, methods are for Nitrate-Nitrite and need to be combined with Ammonia listed above.) | EPA: Cadmium reduction (automated)-353.2 Rev. 2.0, SM: 4500-NO ₃ E-F | EPA: 0.05 mg/L SM : 0.05 mg/L | 28 days | Cool ≤6°C, H ₂ SO ₄ to pH <2 |

40 CFR § 136: <http://www.ecfr.gov/cgi-bin/text>

<http://www.ecfr.gov/cgi-bin/text?idq?SID=b3b41fdea0b7b0b8cd6c4304d86271b7&mc=true&node=pt40.25.136&rgn=div5>

SM = Standard Methods

SECTION 6.3 INTERPRETING OUTFALL SAMPLING RESULTS

Outfall analytical data from dry weather sampling can be used to help identify the major type or source of discharge. **Table 6-4** shows values identified by the USEPA and the Center for Watershed Protection as typical screening values for select parameters. These represent the typical

concentration (or value) of each parameter expected to be found in stormwater. Screening values that exceed these benchmarks may be indicative of pollution and/or illicit discharges.

Table 6-4 Benchmark Field Measurements for Select Parameters

| Analyte or Parameter | Benchmark |
|---|--|
| Ammonia | >0.5 mg/L |
| Conductivity | >2,000 µS/cm |
| Surfactants | >0.25 mg/L |
| Chlorine | >0.02 mg/L (detectable levels per the 2016 MS4 Permit) |
| Indicator Bacteria: <i>E.coli</i> <i>Enterococcus</i> | <i>E.coli</i> : the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 126 colonies per 100 ml and no single sample taken during the bathing season shall exceed 235 colonies per 100 ml <i>Enterococcus</i> : the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 33 colonies per 100 mL and no single sample taken during the bathing season shall exceed 61 colonies per 100 mL |

SECTION 6.4 DRY WEATHER WORK COMPLETED TO DATE

The Town’s outfall inventory contained 5 outfalls when the NOI was submitted in 2018. Town field staff, or hired representatives, screened outfalls as part of the 2003 MS4 Permit, and since the start of the new 2016 MS4 Permit, the Town has completed dry weather screening of the remaining outfalls. Screenings were completed over the course of two days in May 2020 and August 2020. During screening, because field staff could not locate the original 5 outfalls - and there were no nearby structures - they were determined to not exist. Field staff discovered and screened 4 outfalls, all without flow. After completing dry weather screenings, the Town’s outfall inventory is now 4 outfalls. Screening and sampling results are attached as **Appendix D**.

SECTION 6.5 FOLLOW-UP RANKING OF OUTFALLS AND INTERCONNECTIONS

The Town of Eastham is responsible for updating the ranking of outfalls and interconnections. Outfalls/interconnections where relevant information is found indicating sewer input to the MS4 or sampling results indicating sewer input are highly likely to contain illicit discharges from sanitary sources. Such outfalls/interconnections are ranked at the top of the High Priority Outfalls category for investigation. Other outfalls and interconnections may be re-ranked based on any new information from the dry weather screening.

The Town updated and re-prioritized the initial outfall and interconnection rankings based on information gathered during dry weather screening over the first three (3) years of the permit term (June 30, 2021). The outfall ranking table changed in the following ways. Only two (2) outfalls were elevated from a low priority to a high priority outfall. These structures had elevated levels of ammonia during dry weather sampling in March 2021, which triggered the high priority ranking. The updated ranking table is attached as **Appendix E**.

SECTION 7 CATCHMENT INVESTIGATIONS

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

SECTION 7.1 SYSTEM VULNERABILITY FACTORS

The Department of Public Works has reviewed relevant mapping and historic plans and records to identify areas within the catchment with higher potential for illicit connections. The following information has been reviewed:

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

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

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
- Any storm drain infrastructure greater than 40 years old

- Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)
- History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)
- Common or twin-invert manholes serving storm and sanitary sewer alignments
- Common trench construction serving both storm and sanitary sewer alignments
- Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system
- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system
- Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints
- Areas formerly served by combined sewer systems
- Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations
- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs
- Any sanitary sewer infrastructure greater than 40 years old

A blank SVF inventory is documented in **Appendix F** and will be filled out for each catchment as SVFs are identified. The SVF inventory will be included in each annual report.

SECTION 7.2 DRY WEATHER MANHOLE INSPECTIONS

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

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

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

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

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

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

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

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

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

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

Inspection of key junction manholes will proceed as follows:

1. Manholes will be opened and inspected for visual and olfactory evidence of illicit connections. A sample field inspection form is provided in **Appendix D**.
2. If flow is observed, a sample will be collected and analyzed at a minimum for ammonia, chlorine, and surfactants. Field kits can be used for these analyses. Sampling and analysis will be in accordance with procedures outlined in **Section 6**. Additional indicator sampling may assist in determining potential sources (e.g., bacteria for sanitary flows, conductivity to detect tidal backwater, etc.).
3. Where sampling results or visual or olfactory evidence indicate potential illicit discharges or SSOs, the area draining to the junction manhole will be flagged for further upstream manhole investigation and/or isolation and confirmation of sources.

4. Subsequent key junction manhole inspections will proceed until the location of suspected illicit discharges or SSOs can be isolated to a pipe segment between two manholes.
5. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completion of key junction manhole sampling.

SECTION 7.3 WET WEATHER OUTFALL SAMPLING

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

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

Wet weather outfall sampling will proceed as follows:

1. At least one wet weather sample will be collected at the outfall for the same parameters required during dry weather screening.
2. Wet weather sampling will occur during or after a storm event of sufficient depth or intensity to produce a stormwater discharge at the outfall. There is no specific rainfall amount that will trigger sampling, although minimum storm event intensities that are likely to trigger sanitary sewer interconnections are preferred. To the extent feasible, sampling should occur during the spring (March through June) when groundwater levels are relatively high.
3. If wet weather outfall sampling indicates a potential illicit discharge, then additional wet weather source sampling will be performed, as warranted, or source isolation and confirmation procedures will be followed as described in **Section 7.4**.
4. If wet weather outfall sampling does not identify evidence of illicit discharges, and no evidence of an illicit discharge is found during dry weather manhole inspections, catchment investigations will be considered complete.

SECTION 7.4 SOURCE ISOLATION AND CONFIRMATION

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

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

These methods are described in the sections below. Instructions for these and other IDDE methods are provided in **Appendix G**.

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

Section 7.4.1 Sandbagging

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

Section 7.4.2 Smoke Testing

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

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

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

Section 7.4.3 Dye Testing

Dye testing involves flushing non-toxic dye into plumbing fixtures such as toilets, showers, and sinks and observing nearby storm drains and sewer manholes as well as stormwater outfalls for the presence of the dye. Similar to smoke testing, it is important to inform local residents and business

owners. Police, fire, and local public health staff should also be notified prior to testing in preparation of responding to citizen phone calls concerning the dye and their presence in local surface waters.

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

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

Section 7.4.4 CCTV/Video Inspection

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

Section 7.4.5 Optical Brightener Monitoring

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

Section 7.4.6 IDDE Canines

Dogs specifically trained to smell human-related sewage are becoming a cost-effective way to isolate and identify sources of illicit discharges. While not widespread at the moment, the use of IDDE canines is growing as is the canines' accuracy. The use of IDDE canines is not recommended as a

standalone practice for source identification; rather it is recommended as a tool to supplement other conventional methods, such as dye testing, in order to fully verify sources of illicit discharges.

SECTION 7.5 ILLICIT DISCHARGE REMOVAL

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

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

Section 7.5.1 Confirmatory Outfall Screening

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

SECTION 7.6 ONGOING SCREENING

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

SECTION 8 TRAINING

Annual IDDE training is made available to all employees involved in the IDDE program. This training includes information on how to identify illicit discharges and SSOs and may also include additional training specific to the functions of particular personnel and their function within the framework of

the IDDE program. Training records are and will continue to be maintained. A training attendance log is included in **Appendix H**. The frequency and type of training is included in the annual report.

SECTION 9 PROGRESS REPORTING

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

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

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

APPENDIX A

Legal Authority (IDDE By-law or Ordinance)

TOWN OF EASTHAM



STORMWATER MANAGEMENT REGULATIONS

ENACTED BY THE TOWN OF EASTHAM SELECT BOARD

ADOPTED ON MAY 18, 2020

UPDATED ON JUNE 7, 2021

TABLE OF CONTENTS

| | |
|--|----|
| SECTION 1 – GENERAL | 1 |
| 1.01 Purpose and Objectives..... | 1 |
| 1.02 Authority..... | 1 |
| 1.03 Definitions..... | 1 |
| SECTION 2 – ILLICIT DISCHARGE DETECTION AND ELIMINATION | 7 |
| 2.01 Applicability | 7 |
| 2.02 Responsibility for Administration..... | 7 |
| 2.03 Prohibitive Activities | 7 |
| 2.04 Exemptions | 8 |
| 2.05 Enforcement..... | 8 |
| 2.06 Severability | 9 |
| SECTION 3 – CONSTRUCTION EROSION AND SEDIMENT CONTROL, AND POST- CONSTRUCTION STORMWATER MANAGEMENT | 10 |
| 3.01 Preamble | 10 |
| 3.02 Purpose and Objectives..... | 10 |
| 3.03 Applicability and Exemptions..... | 10 |
| 3.04 Soil Erosion and Sediment Control..... | 11 |
| 3.05 Post-Construction Stormwater Management | 12 |
| 3.06 Enforcement..... | 13 |
| 3.07 Severability | 14 |

SECTION 1 – GENERAL

1.01 Purpose and Objectives

1. To protect and enhance the public health, safety, environment, and general welfare of the citizens of the Town of Eastham through the regulation and elimination of Illicit Discharges to the Eastham Stormwater System
2. To control the detrimental effects of Erosion and Sedimentation deriving from Construction Site Stormwater Runoff, and require the development of Post-Construction Stormwater Management plans to ensure proper functioning and maintenance of Stormwater infrastructure
3. To ensure the Town of Eastham’s compliance with the Environmental Protection Agency’s National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) General Permits of 2003 and 2016, as well as all other applicable Federal and State Laws
4. To develop comprehensive stormwater management regulations that are congruent with existing Town of Eastham Bylaws and Regulations, to establish the Massachusetts Stormwater Standards and the MassDEP Stormwater Handbook as the governing regulatory standard for project design, review, construction and facility operation, to encourage groundwater recharge and the use of stormwater best management practices for the protection of our aquifer

1.02 Authority

These Regulations are adopted by the Town of Eastham’s Select Board pursuant to Massachusetts General Laws c. 83, §10, and the regulations of the Federal Clean Water Act found at 40 CFR 122.34. Nothing in these regulations is intended to replace the requirements of the Town of Eastham Wetlands Protection Bylaw, Zoning Bylaw, Subdivision Rules and Regulations, Board Of Health Regulations, or of any other bylaw that may be adopted by the Town of Eastham, or any state or federal requirement, law, regulation or policy. Any activity subject to the provisions of these regulations must comply with all other applicable Town, State or Federal requirements.

1.03 Definitions

ABUTTING PROPERTY — Land sharing one or more common boundaries with the project area.

ADVERSE IMPACT — An activity that has a deleterious effect on waters or wetlands, including their quality, quantity, surface area, species composition, aesthetics or usefulness for human or natural uses which are or may potentially be harmful or injurious to human health, welfare, safety or property, to biological productivity, diversity, or stability or which unreasonably interfere with the enjoyment of life or property, including outdoor recreation.

AGRICULTURAL ACTIVITIES – The normal maintenance or improvement of land in agricultural or aquacultural use, as defined by the Massachusetts Wetlands Protection Act, M.G.L. c. 131, § 40, and its implementing regulations.

ALTERATION — Any activity, which will change the ability of a ground surface area to absorb water or will change existing surface drainage patterns. Any activity on an area of land that changes the water quality, force, direction, timing or location of runoff flowing from the area. Such changes include: change from distributed runoff to confined, discrete discharge; change in the volume of runoff from the area; change in the peak rate of runoff from the area; and change in the recharge to groundwater on the area. Examples of alterations include, but are not limited to, earthmoving, paving, and modification of existing vegetation.

APPLICANT – Any person, individual, partnership, association, firm, company, corporation, trust, authority, agency, department, or political subdivision of the Commonwealth of Massachusetts or the federal government, to the extent permitted by law, applying for a permit with the Town of Eastham.

BEST MANAGEMENT PRACTICE (BMP) – An activity, procedure, restraint, or structural improvement that helps to reduce the quantity or improve the quality of stormwater runoff.

BUILDING COMMISSIONER — The Town of Eastham Building Commissioner or his/her designee.

CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL – A certified specialist in soil erosion and sediment control. This certification program, sponsored by the Soil and Water Conservation Society in cooperation with the American Society of Agronomy, provides the public with evidence of professional qualifications.

CLEAN WATER ACT – The Federal Water Pollution Control Act (33 U.S.C. §1251 et seq.) as amended.

CLEARING – Any activity that removes the vegetative surface cover.

CONSTRUCTION AND WASTE MATERIALS – Excess or discarded building or site materials, including but not limited to concrete truck washout, chemicals, litter and sanitary waste at a construction site that may adversely impact water quality.

CONSTRUCTION SITE — Any site where activity is proposed or occurs that involves the alteration of more than one acre of land.

DEVELOPMENT – The modification of land to accommodate a new use or expansion of use, usually involving construction.

DIRECT DISCHARGE – Any pipe, open channel, or concentrated flow path where stormwater runoff is conveyed directly to a water body without prior stormwater treatment or volume reduction.

DISCHARGE OF POLLUTANTS – The addition from any source of any pollutant or combination of pollutants into the municipal storm drain system or into the waters of the United States or Commonwealth from any source.

DISTURBANCE – Any activity that causes a temporary or permanent change in the position or location of soil, vegetation, impervious cover, or other land surface that exposes soils to potential erosion, changes the ability of a ground surface area to absorb water, increases polluted runoff, and/or changes the existing surface drainage patterns.

DPW – Eastham Department of Public Works.

ENFORCEMENT ORDER – A written order issued by the Select Board in order to enforce the provisions of these regulations.

EROSION – The wearing away of the land surface by natural or artificial forces such as wind, water, ice, gravity, or vehicle traffic and the subsequent detachment and transportation of soil particles.

EROSION AND SEDIMENTATION CONTROL PLAN – A document containing narrative, drawings and details developed by a qualified professional engineer (PE) or a Certified Professional in Erosion and Sedimentation Control (CPESC), which includes BMPs, or equivalent measures designed to control surface runoff, erosion and sedimentation during pre-construction and construction related land disturbance activities.

GRADING – Changing the level or shape of the ground surface.

GROUNDWATER – Water beneath the surface of the ground.

GRUBBING – The act of clearing land surface by digging up roots and stumps.

ILLCIT CONNECTION – A surface or subsurface drain or conveyance, which allows an illicit discharge into the municipal storm drain system, including without limitation sewage, process wastewater, or wash water and any connections from indoor drains, sinks, or toilets, regardless of whether said connection was previously allowed, permitted, or approved before the effective date of these regulations.

ILLCIT DISCHARGE – Direct or indirect discharge to the municipal storm drain system that is not composed entirely of stormwater, except as exempted in Section 2.04. The term does not include a discharge in compliance with an NPDES Storm Water Discharge Permit or a Surface Water Discharge Permit, or resulting from firefighting activities exempted pursuant to Section 2.04 of these regulations.

IMPERVIOUS SURFACE – Any material or structure that either prevents or slows the entry of water into the underlying soil or causes water to runoff in greater quantities or at an increased rate of flow. Common impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking lots, storage areas, concrete or asphalt paving, and gravel or dense-graded crushed stone areas.

IMPERVIOUS COVER – Any material or structure on or above the ground that prevents water from infiltrating through the underlying soil. Impervious cover includes, without limitation, paved parking lots, roads, sidewalks, driveways, patios, roof tops, and swimming pools. Gravel and dirt surfaced roads and parking areas that have become compacted by vehicles and heavy equipment are considered impervious. Permeable pavers and porous pavements designed to prevent compaction are not considered impervious. The term “impervious cover” shall include “impervious area” and “impervious surface.”

INFILTRATION – The act of conveying precipitation or runoff into the ground to permit groundwater recharge and the reduction of surface runoff from a project site.

LOW IMPACT DEVELOPMENT (LID) – An approach to land development design and stormwater management that attempts to mimic the natural hydrology of the site by avoiding, reducing and mitigating impacts with natural, non-structural and structural measures.

MASSDEP – Massachusetts Department of Environmental Protection

MASSDEP STORMWATER HANDBOOK – MassDEP’s published guidelines to assist with compliance with the Massachusetts Stormwater Management Standards

MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS – The Standards as further defined by the Massachusetts Stormwater Handbook, issued by the Department of Environmental Protection, and as amended, coordinating the requirements prescribed by state regulations promulgated under the authority of the Massachusetts Wetlands Protection Act G.L. c. 131 §. 40 and Massachusetts Clean Waters Act G.L. c. 21, §. 23-56. The Standards address stormwater impacts through implementation of performance standards to reduce or prevent pollutants from reaching water bodies and control the quantity of runoff from a site.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) or MUNICIPAL STORM DRAIN SYSTEM – The system of conveyances designed or used for collecting or conveying stormwater, including, without limitation, any road with a drainage system, street, gutter, curb, inlet, piped storm drain, pumping facility, retention or detention basin, natural or man-made or altered drainage channel, and other drainage structure that together comprise the storm drainage system owned or operated by the Town of Eastham.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGE PERMIT – A permit issued by United States Environmental Protection Agency or jointly with the Massachusetts Department of Environmental Protection that authorizes the discharge of pollutants to waters of the United States.

NON-STORMWATER DISCHARGE – Discharge to the municipal storm drain system not composed entirely of stormwater.

NEW DEVELOPMENT – Any construction or land disturbance on a lot, or portion of a lot, or linear right-of-way or easement that is currently in a vegetated state.

OPERATION AND MAINTENANCE (O&M) PLAN – A plan setting up the functional, financial and organizational mechanisms for the ongoing operation and maintenance of a stormwater management system to insure that it continues to function as designed.

OUTFALL – The point at which stormwater flows out from a point source discernible, confined and discrete conveyance into waters of the Commonwealth.

OWNER – A person with a legal or equitable interest in property.

PERSON – An individual, partnership, association, firm, company, trust, corporation, agency, authority, department or political subdivision of the Commonwealth or the federal government, to the extent permitted by law, and any officer, employee, or agent of such person.

POINT SOURCE – Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, or container from which pollutants are or may be discharged.

POLLUTANT – Any element or property of sewage, agricultural, industrial or commercial waste, runoff, leachate, heated effluent, or other matter whether originating at a point or nonpoint source, that is or may be introduced into any storm sewage treatment works or waters of the Commonwealth.

POLLUTANT (cont.) – Pollutants shall include without limitation: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordnances, accumulations and floatables; pesticides, herbicides, and fertilizers; hazardous materials and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; rock, sand, salt, soils; construction wastes and residues; and noxious or offensive matter of any kind.

POST-CONSTRUCTION or POST-DEVELOPMENT – The conditions expected to exist after completion of the proposed development activity in accordance with approved plans on a specific site or tract of land, and does not refer to or include the construction phase of a project.

PRE-CONSTRUCTION – All activity in preparation for construction.

PRE-DEVELOPMENT – The conditions that exist prior to the proposed development. Where phased development or plan approval occurs (e.g., preliminary grading, roads, and utilities, etc.), the existing conditions at the time prior to the first plan submission shall establish pre-development conditions.

PROCESS WASTEWATER – Water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any material, intermediate product, finished product, or waste product.

PROJECT AREA – The portion of a parcel of land being developed or redeveloped.

RECHARGE – The process by which groundwater is replenished by precipitation through the percolation of runoff and surface water through the soil.

REDEVELOPMENT – Any construction, alteration, improvement, repaving, or resurfacing on a site that contains impervious cover, provided the activity does not increase net impervious cover. Portions of a project that increase impervious cover will be treated as new development.

REVIEWING AGENT – Any Town Employee, board or agent delegated in writing by the Select Board to administer, implement, and enforce the Stormwater Management Regulations.

ROAD IMPROVEMENTS – For the purposes of these regulations, work on existing roads that trigger stormwater management compliance include resurfacing projects when the sub-base is intersected, the road is being widened, or when the project includes direct drainage to a beach, pond, tributary or wetland, except as exempted in Section 3.04.

RUNOFF – Rainfall, snowmelt, or irrigation water flowing over the ground surface.

SEDIMENT – Mineral or organic soil material that is transported by wind or water, from its origin to another location; the product of erosion processes.

SEDIMENTATION – The process or act of deposition of sediment.

SITE - Any lot or parcel of land where land-disturbing activities are, were, or will be performed. A parcel of land being developed or redeveloped.

SLOPE – The incline of a ground surface expressed as a ratio of horizontal distance to vertical distance.

SOIL – Any earth, sand, rock, gravel, loam, or similar material.

STABILIZATION – The use, singly or in combination, of mechanical, structural, or vegetative methods, to prevent or retard erosion.

STORMWATER – Stormwater runoff, snow melt runoff, and surface water runoff and drainage.

STORMWATER MANAGEMENT – Using engineered structures and non-structural (e.g., site design, vegetation) measures to reduce runoff volume and rates, remove pollutants, promote infiltration, or minimize sources of pollution.

STRIP – Any activity which removes the vegetative ground surface cover, including tree removal, clearing, grubbing, and storage or removal of topsoil or other surficial organic material.

SURFACE WATER DISCHARGE PERMIT – A permit issued by the Massachusetts Department of Environmental Protection (MassDEP) pursuant to 314 CMR 3.00 that authorizes the discharge of pollutants to waters of the Commonwealth of Massachusetts.

TOXIC OR HAZARDOUS MATERIAL or WASTE – Any material, which because of its quantity, concentration, chemical, corrosive, flammable, reactive, toxic, infectious or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare, or to the environment. Toxic or hazardous materials include any synthetic organic chemical, petroleum product, heavy metal, radioactive, biological, or infectious waste, acid and alkali, and any substance defined as Toxic or Hazardous under G.L. Ch.21C and Ch.21E, and the regulations at 310 CMR 30.000 and 310 CMR 40.0000. TSS: Total Suspended Solids.

WASTEWATER – Any sanitary waste, sludge, or septic tank or cesspool overflow, and water that during manufacturing, cleaning 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.

WATERCOURSE – A natural or man-made channel through which water flows or a stream of water, including a river, brook, or underground stream.

WATERS OF THE COMMONWEALTH – All waters within the jurisdiction of the Commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, coastal waters, and groundwater.

WETLAND RESOURCE AREAS – Areas specified in the Massachusetts Wetlands Protection Regulations, 310 CMR 10.00, as amended, and in the Town of Eastham Wetland Bylaw and Regulations, as amended.

Terms not defined shall be construed according to their customary and usual meaning, unless the context indicates a special or technical meaning. Words used in the present tense include the future; words in the singular number include the plural and words in the plural number include the singular; and the word "shall" is mandatory and not a suggestion. Additional definitions may be adopted by separate regulation.

SECTION 2 – ILLICIT DISCHARGE DETECTION AND ELIMINATION

2.01 Applicability

These regulations shall apply to any and all illicit discharges entering the municipally owned storm drainage system.

2.02 Responsibility for Administration

1. The Eastham Select Board shall administer, implement and enforce these regulations. Any powers granted to, or duties imposed upon, the Board may be delegated in writing by the Board to any employees or agents of the Town, including but not limited to the Health Agents, DPW Superintendent or the Eastham Police Department.
2. The Select Board may amend these rules and regulations after holding a public hearing. Notice of the time, place and subject matter shall be published in a newspaper of general circulation in The Town of Eastham once, not less than 14 days before the day of such a hearing.

2.03 Prohibitive Activities

1. Illicit Discharges. No person shall dump, discharge, cause or allow to be discharged any pollutant or non-stormwater discharge into the municipal separate storm drain system (MS4), into a watercourse, or into the waters of the Commonwealth, or into abutting property.
2. Illicit Connections. No person shall construct, use, allow, maintain or continue any illicit connection to the municipal storm drain system, regardless of whether the connection was permissible under applicable law, regulation or custom at the time of connection.
3. Obstruction of Municipal Storm Drain System. No person shall obstruct or interfere with the normal flow of stormwater into or out of the municipal storm drain system without prior written approval from the Board.
4. Pumping of Water. No person shall direct, discharge, lead, or pump water, clear or otherwise, including groundwater and/or rooftop runoff, onto any public ways or streets, adjacent property, into the Town's municipal separate storm drain system, or into any watercourse or waters of the Commonwealth. Any pumping of groundwater shall be done in such a way that the water is contained in its entirety on the originating property and shall not create a public nuisance to the Town or abutting properties.
5. Discharging of Pool Water. No person shall pump pool water, dechlorinated or otherwise, onto any public ways or streets, adjacent property, into the Town's municipal separate storm drain system, or into any watercourse or waters of the Commonwealth. Any pumping of pool water shall be done in such a way that the water is contained in its entirety on the originating property and shall not create a public nuisance to the Town or abutting properties.

2.04 Exemptions

The following non-stormwater discharges or flows are exempt from these regulations provided that the source is not a significant contributor of a pollutant to the municipal storm drain system:

1. Discharge or flow resulting from firefighting activities;
2. Waterline flushing;
3. Flow from potable water sources;
4. Springs;
5. Natural flow from riparian habitats and wetlands;
6. Diverted stream flow;
7. Uncontaminated groundwater infiltration directly into the drainage system and/or MS4 as defined in 40 CFR 35.2005(20);
8. Incidental discharges from landscape irrigation or lawn watering;
9. Water from individual residential car washing;
10. Discharge from street sweeping of minor amounts of water during operations;
11. Dye testing activity in relation with a municipal operation. For private operations, if verbal notification is given to the Board prior to the time of the test;
12. Non-stormwater discharge permitted under an NPDES permit or a Surface Water Discharge Permit, waiver, or waste discharge order administered under the authority of the United States Environmental Protection Agency or the Massachusetts Department of Environmental Protection, provided that the discharge is in full compliance with the requirements of the permit, waiver, or order and applicable laws and regulations; and
13. Discharges for which advanced written approval is received from the Board as necessary to protect public health, safety, welfare or the environment.

2.05 Enforcement

1. The Board or an authorized agent of the Board shall enforce these regulations, orders, violation notices, and enforcement orders, and may pursue all civil and non-criminal remedies for such violations.
2. Civil Relief. If a person violates the provisions of these regulations, permit, notice, or order issued thereunder, the Board may seek injunctive relief in a court of competent jurisdiction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.
3. Orders. The Board or an authorized agent of the Board may issue a written order to enforce the provisions of these regulations, which may include:
 - (1) Elimination of illicit connections or discharges to the MS4;
 - (2) Performance of monitoring, analyses, and reporting;
 - (3) That unlawful discharges, practices, or operations shall cease and desist; and
 - (4) Remediation of contamination in connection therewith.
4. If the enforcing person determines that abatement or remediation of contamination is required, the order shall set forth a deadline by which such abatement or remediation must be completed. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the Town of Eastham may, at its option, undertake such work, and expenses thereof shall be charged to the violator.

5. Within thirty (30) days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner will be notified of the costs incurred by the Town of Eastham including administrative costs. The violator or property owner may file a written protest objecting to the amount or basis of costs with the Board within thirty (30) days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within thirty (30) days following a decision of the Board affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the costs shall become a special assessment against the property owner and shall constitute a lien on the owner's property for the amount of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in MGL c. 59, § 57, after the 31st day at which the costs first become due.
6. Civil Penalty. Any violation of any provision of these regulations, order or permit issued thereunder shall be punishable by a civil penalty of not more than \$100 per violation. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.
7. Non-Criminal Disposition. As an alternative to civil action, the Town of Eastham may elect to utilize the non-criminal disposition procedure set forth in MGL c. 40, § 21D, and Chapter I, Article I, of the Town of Eastham Bylaws. The fine for the first violation shall be \$100. The fine for the second violation shall be \$200. The fine for the third and all subsequent violations shall be \$300. Each day or part thereof that such violation(s) occurs or continues shall constitute a separate offense. The Town of Eastham may also impose additional penalties for reimbursement of labor and/or materials used to temporarily remedy the violation.
8. Entry to Perform Duties Under these regulations. To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the Board, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under these regulations and may make or cause to be made such examinations, surveys or sampling as the Board deems reasonably necessary.
9. Appeals. The decisions or orders of the Board shall be final. Further relief shall be to a court of competent jurisdiction.
10. Remedies Not Exclusive. The remedies listed in these regulations are not exclusive of any other remedies available under any applicable federal, state or local law.

2.06 Severability

The provisions of these regulations are hereby declared to be severable. If any provision, paragraph, sentence, or clause, of these regulations or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of these regulations.

SECTION 3 – CONSTRUCTION EROSION AND SEDIMENT CONTROL, AND POST-CONSTRUCTION STORMWATER MANAGEMENT

3.01 Preamble

Construction site stormwater runoff and post-construction stormwater discharges can adversely affect public safety, public and private property, surface water, groundwater resources, drinking water supplies, recreation, aquatic habitats, fish and other aquatic life, property values and other uses of land and water. It is in the public interest to regulate construction site stormwater runoff and post-construction stormwater discharges in order to minimize the impacts identified above.

3.02 Purpose and Objectives

The purpose of these regulations is to establish minimum requirements and controls to protect and safeguard the environment, natural resources, general health, safety, and welfare of the public residing in the Town of Eastham from the adverse impacts of soil erosion, sedimentation, and stormwater runoff. This section seeks to meet that purpose through the following objectives:

1. Eliminating or reducing the adverse effects of soil erosion and sedimentation;
2. Minimizing stormwater runoff from any development;
3. Minimizing nonpoint source pollution caused by stormwater runoff from development;
4. Providing for groundwater recharge where appropriate;
5. Ensuring controls are in place to respond to the aforementioned objectives and that these controls are properly operated and maintained.
6. Establishing provisions for the long-term responsibility for and maintenance of structural stormwater control facilities and nonstructural stormwater management practices to ensure that they continue to function as designed, are maintained, and pose no threat to public safety;
7. Encouraging the use of nonstructural stormwater management practices or "low-impact development" practices, i.e. grass swales, rain gardens and other BMPs; and
8. Establishing administrative procedures, fees and fines for violations for the submission, review, approval or disapproval of applications for stormwater management permits, and for the inspection of approved active projects, and long-term follow up.
9. Ensuring development adheres to MassDEP's Stormwater Handbook and Stormwater Standards

3.03 Applicability and Exemptions

These regulations shall apply to all activities that result in:

1. A land disturbance activity of one or more acres of land, or that will disturb less than one acre of land but are part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one acre of land

2. No person shall perform any activity that results in a land disturbance activity of an acre or more of land without an approved soil erosion and sediment control plan and stormwater management plan
3. The following exemptions from these regulations apply:
 - (1) Any land disturbance of less than one acre of land;
 - (2) Normal maintenance and improvement of land in agricultural use as defined by the Wetlands Protection Act regulation, 310 CMR 10.04;
 - (3) In addition, as authorized in the Phase II Small MS4 General Permit for Massachusetts, stormwater discharges resulting from the above activities that are subject to jurisdiction under the Wetland Protection Act and demonstrate compliance with the Massachusetts Stormwater Management Standards as reflected in an order of conditions issued by the Town of Eastham Conservation Commission are deemed to be in compliance with these regulations
 - (4) Emergency activities necessary to protect public health or safety, so long as all necessary emergency permits or emergency certifications have been or will be obtained, including emergency repairs to roads or their drainage systems as per the Massachusetts Stormwater Handbook and Stormwater Standards;
 - (5) Normal maintenance and improvements of Town of Eastham publicly owned roads, including but not limited to asphalt resurfacing, road reclamation, regrading of existing gravel roads and any other minor activities as described by 310 CMR 10.02 (2)(b) 2;
 - (6) Any work or projects for which all necessary approvals and permits have been issued before the effective date of these regulations.

3.04 Soil Erosion and Sediment Control

1. An erosion and sedimentation control plan review is triggered by a site development plan and/or a building permit application or other activity that falls within the jurisdiction of these regulations.
2. Applicants shall be referred by the permit-issuing agency (Planning Board, Zoning Board of Appeals, Building Department, etc.) to the Department of Public Works to conduct the soil erosion and sediment control plan review.
3. Activities that fall within the jurisdiction of this bylaw that do not require a permit from any Town department are not exempt from this provision. In this situation, the applicant must seek a soil erosion and sediment control plan review directly from the Department of Public Works.
4. The Superintendent of Public Works may take any of the following actions as a result of their review: approval, approval with conditions, disapproval, or disapproval without prejudice.
5. The Building Commissioner shall administer, implement and enforce these regulations. Any powers granted to or duties imposed upon the Building Commissioner may be delegated by the Building Commissioner to his/ her designee, including but not limited to the DPW Superintendent.

6. The Erosion and Sediment Control Plan shall contain sufficient information to describe the nature and purpose of the proposed development, pertinent conditions of the site and the adjacent areas, and proposed erosion and sedimentation controls which include BMPs appropriate to site conditions, including efforts to minimize the areas of land disturbance. The plan shall also describe measures to control construction wastes including but not limited to construction materials, concrete truck wash out chemicals, litter, and sanitary waste.
7. Stormwater systems shall be designed to avoid disturbances of areas susceptible to erosion and sediment loss. This means avoiding to the greatest extent practicable: the damaging of large forest stands; building on steep slopes (15% or greater); and disturbing land in wetland buffer zones and floodplains.

3.05 Post-Construction Stormwater Management

1. A stormwater management plan review is triggered by a site development plan and/or a building permit application or other activity that falls within the jurisdiction of these regulations.
2. Applicants shall be referred by the permit-issuing agency (Planning Board, Zoning Board of Appeals, Building Department, etc.) to the Department of Public Works to conduct the stormwater management plan review
3. Activities that fall within the jurisdiction of this bylaw that do not require a permit from any Town department are not exempt from this provision. In this situation, the applicant must seek stormwater management plan review directly from the Director.
4. An operation and maintenance plan (O&M Plan) is required at the time of application for all projects. The maintenance plan shall be designed to ensure compliance with the permit in all seasons and throughout the life of the system.
5. The Superintendent of Public Works shall make the final decision of what maintenance option is appropriate in a given situation. The Superintendent will consider natural features, proximity of site to water bodies and wetlands, extent of impervious surfaces, size of the site, the types of stormwater management structures, and potential need for ongoing maintenance activities when making this decision.
6. The O&M Plan shall identify and include all required documents, including, but not limited to, maintenance agreements and stormwater management easements. All documents may be submitted to Town Counsel for review
7. As-Builts. Permittees shall submit as-built plans prepared and certified by a Massachusetts Professional Land Surveyor no later than one year after completion of construction projects to be included with the Stormwater Management Plan. The As-Built plans must depict all on site structural and non-structural controls design to manage stormwater associated with the completed site. The plan set must include design specifications of all stormwater management controls prepared and certified by a Massachusetts Professional Engineer
8. The operation and maintenance plan shall remain on file with the Department of Public Works and shall be an ongoing requirement
9. Stormwater Management Systems disturbing a minimum 1 acre of land (or projects that are part of a common plan of development that disturb a minimum 1 acre of land total) must adhere to the following performance standards:

- (1) All Stormwater Management Systems must be designed in compliance with the latest version of the Massachusetts Stormwater Handbook.
- (2) All Stormwater Management Systems must be designed to achieve the following reduction in Total Phosphorous and Total Suspended Solids (TSS) from post-construction stormwater runoff from new and redevelopment:
 - a. New development: 90% removal of average annual load of TSS and 60% removal of average annual load of Total Phosphorus
 - b. Redevelopment: 80% removal of average annual load of TSS and 50% removal of average annual load of Total Phosphorus

3.06 Enforcement

1. The Building Commissioner and the Department of Public Works shall make inspections of all sites covered under these regulations within the Town and may, for these purposes, enter upon the premises where such operations are carried on at all reasonable times.
2. The Select Board, acting through the Building Commissioner, DPW Superintendent, or an authorized employee or agent, shall enforce these regulations, orders, violation notices, and enforcement orders, and may pursue all civil remedies for such violations.
3. Civil Relief. If a person violates the provisions of these regulations, permit, notice, or order issued thereunder, the Board may seek injunctive relief in a court of competent jurisdiction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.
4. Orders. The Board or an authorized agent of the Board may issue a written order to enforce the provisions of these regulations, which may include:
 - (1) That practices, or operations, in defiance of these regulations shall cease and desist; and
 - (2) Remediation of erosion, removal of sedimentation spilled beyond approved limits, in connection therewith;
 - (3) Provision of maintenance to stormwater system in accordance with approved O&M plan
5. Suspension of construction or site alteration activity. In the event that the activity at a site violates the conditions as stated or shown on the approved soil erosion and sediment control plan or stormwater management plan in such a manner as the enforcing agent determines to adversely affect the environment, public welfare/health and municipal facilities, then the agent may suspend work until the violation is corrected.
6. If the enforcing person determines that abatement or remediation of contamination is required, the order shall set forth a deadline by which such abatement or remediation must be completed. Said order shall further advise that, should the violator or property owner fail to abate or perform remediation within the specified deadline, the Town of Eastham may, at its option, undertake such work, and expenses thereof shall be charged to the violator.
7. Within thirty (30) days after completing all measures necessary to abate the violation or to perform remediation, the violator and the property owner will be notified of the costs incurred by the Town of Eastham including administrative costs.

The violator or property owner may file a written protest objecting to the amount or basis of costs with the Board within thirty (30) days of receipt of the notification of the costs incurred. If the amount due is not received by the expiration of the time in which to file a protest or within thirty (30) days following a decision of the Board affirming or reducing the costs, or from a final decision of a court of competent jurisdiction, the costs shall become a special assessment against the property owner and shall constitute a lien on the owner's property for the amount of said costs. Interest shall begin to accrue on any unpaid costs at the statutory rate provided in MGL c. 59, § 57, after the 31st day at which the costs first become due.

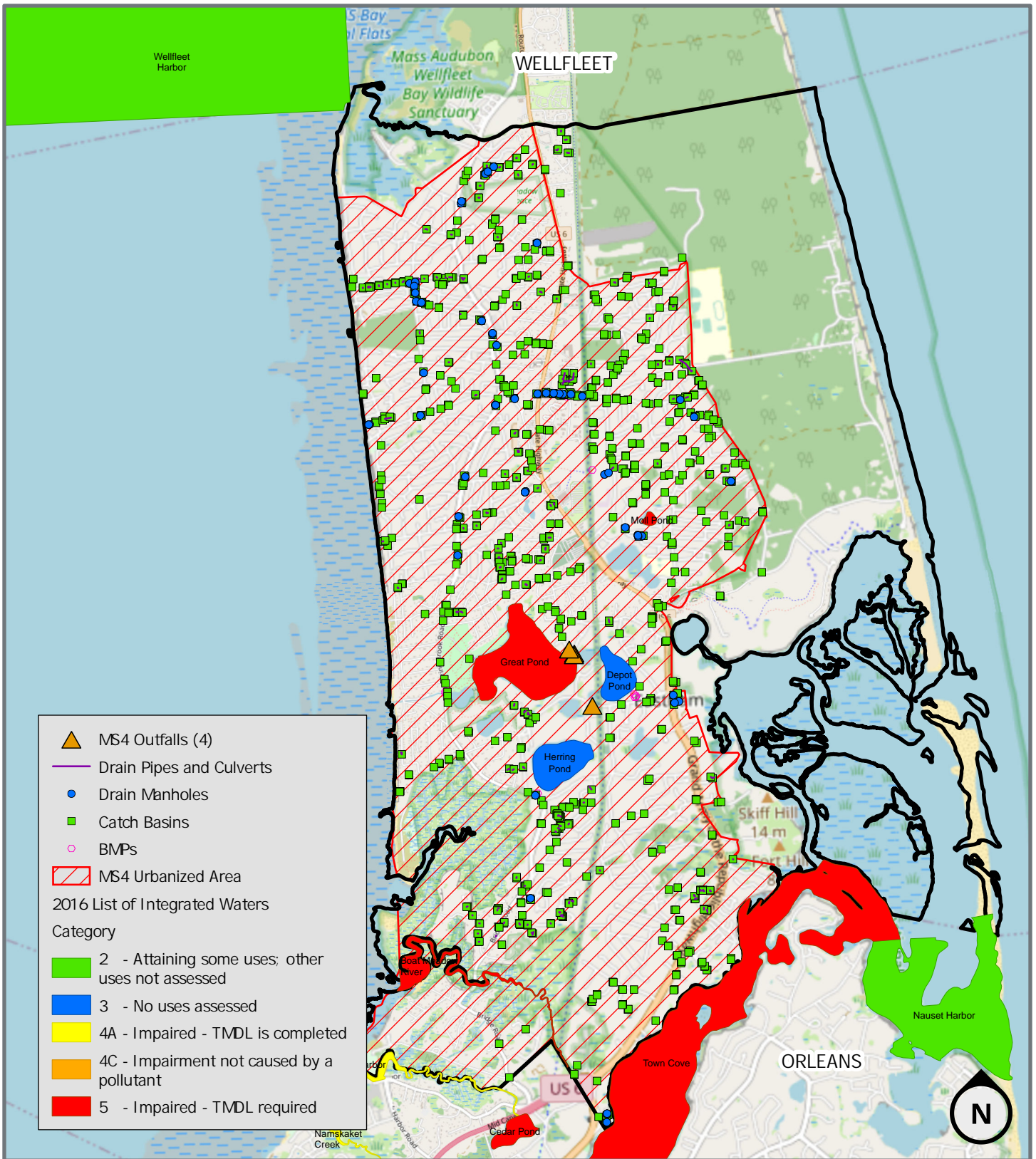
8. Civil Penalty. Any violation of any provision of these regulations, order or permit issued thereunder shall be punishable by a civil penalty of not more than \$100 per violation. Each day or part thereof that such violation occurs or continues shall constitute a separate offense.
9. Non-Criminal Disposition. As an alternative to criminal prosecution or civil action, the Town of Eastham may elect to utilize the non-criminal disposition procedure set forth in MGL c. 40, § 21D, and Chapter I, Article I, of the Town of Eastham Bylaws. The fine for the first violation shall be \$100. The fine for the second violation shall be \$200. The fine for the third and all subsequent violations shall be \$300. Each day or part thereof that such violation(s) occurs or continues shall constitute a separate offense. The Town of Eastham may also impose additional penalties for reimbursement of labor and/or materials used to temporarily remedy the violation.
10. Entry to Perform Duties Under these regulations. To the extent permitted by state law, or if authorized by the owner or other party in control of the property, the Board, its agents, officers, and employees may enter upon privately owned property for the purpose of performing their duties under these regulations and may make or cause to be made such examinations, surveys or sampling as the Board deems reasonably necessary.
11. Appeals. The decisions or orders of the Board shall be final. Further relief shall be to a court of competent jurisdiction.
12. Remedies Not Exclusive. The remedies listed in these regulations are not exclusive of any other remedies available under any applicable federal, state or local law.

3.07 Severability

The Town of Eastham Select Board shall adopt, and may periodically amend, rules and regulations relating to the terms, conditions, definitions, enforcement, fees (including application, inspection, and/or consultant fees), fines and penalties, application requirements, design standards, procedures and administration of these regulations, after conducting a public hearing to receive comments on any proposed rules and regulations, or revisions thereto. Failure by the Town of Eastham Select Board to promulgate such rules and regulations, or a legal declaration of their invalidity by a court, shall not act to suspend or invalidate the effect of these regulations

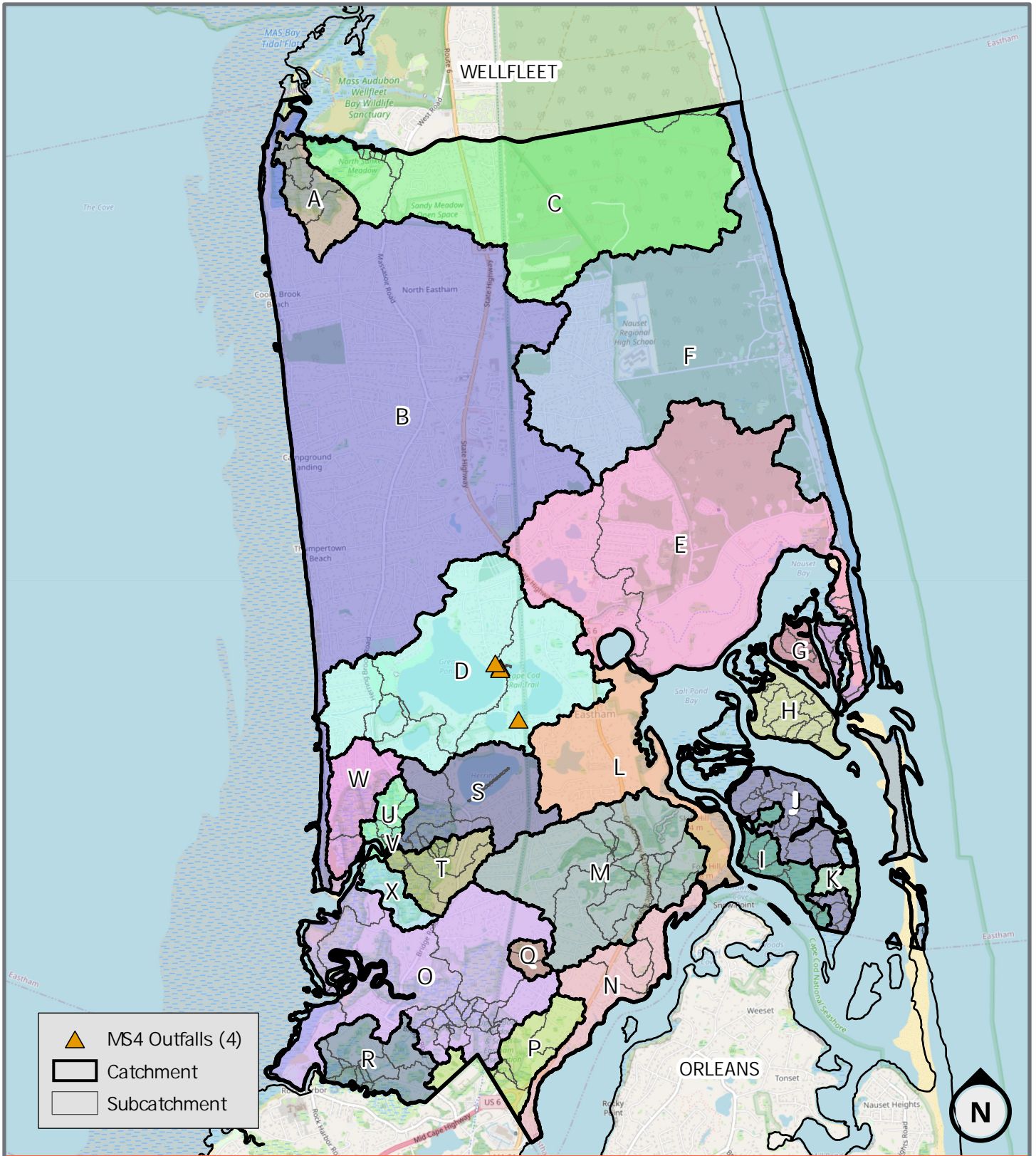
APPENDIX B

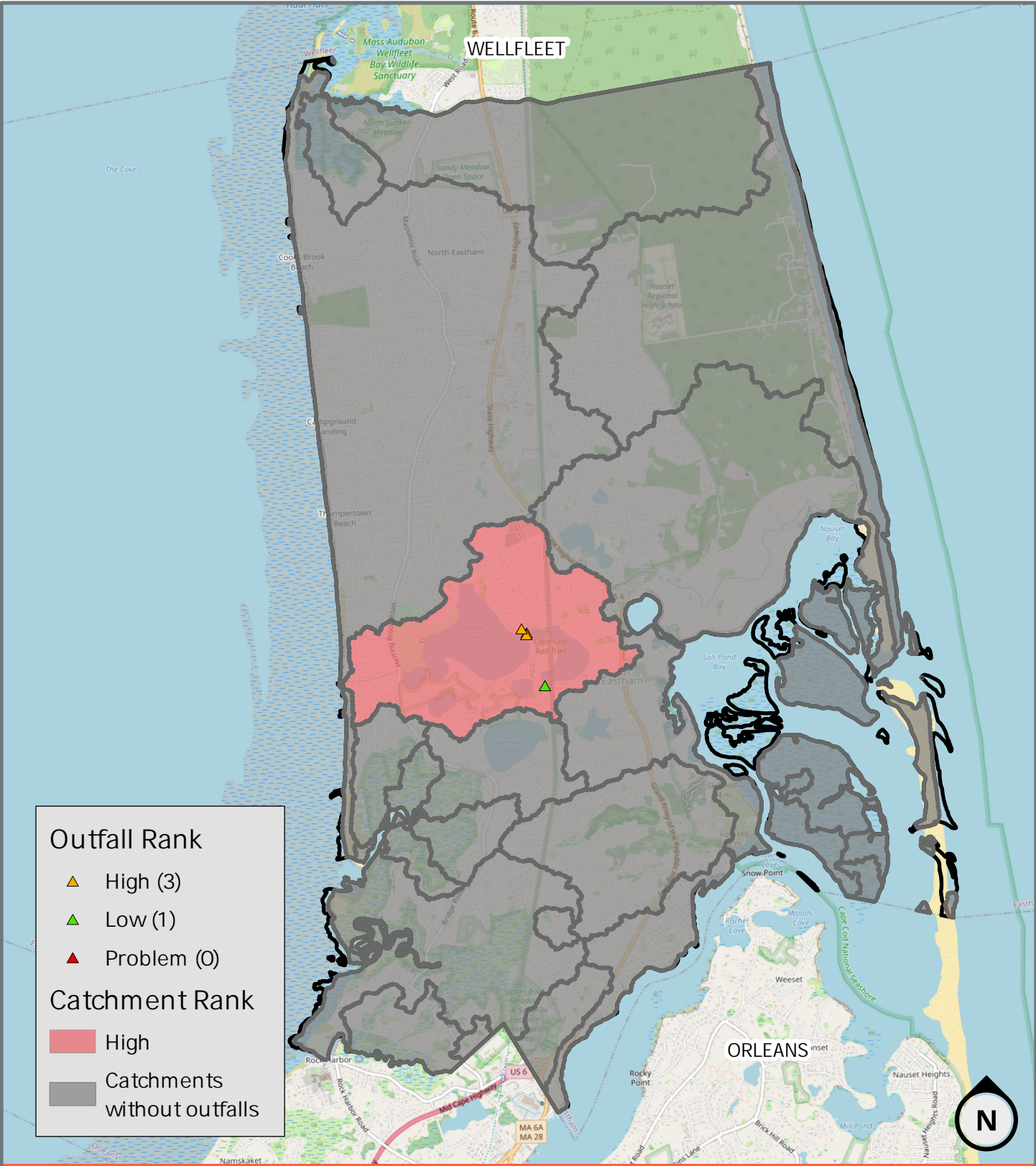
Stormwater System Mapping



APPENDIX C

Catchment Delineation Mapping and Ranking Matrix





APPENDIX D

Outfall Sampling Results

**Appendix D - Outfall Sampling Report
Eastham, MA**

| Structure ID | Discharging Waterbody | Type of Sampling | Sample Date | Field Test Results | | | | | Analytical Results | | | | | |
|--------------|-----------------------|------------------|-------------|--------------------|--|----------------|---------------------------------|-----------|---|----------------------|--------------------------------|--------------------------|---|--------------------------|
| | | | | Temp. (°C) | Specific Conductance (µS/cm) <i>Threshold: 2000</i> | Salinity (ppt) | pH <i>Threshold: 6.5-8.0</i> | DO (mg/L) | Ammonia as Nitrogen (mg/L) <i>Threshold: 0.5</i> | Chlorine, TRC (mg/L) | Fecal Coliform, MF (col/100ml) | Enterococcus (col/100ml) | E. coli (MPN/100 mL) <i>Threshold: 236</i> | Phosphorus, Total (mg/L) |
| OF-001 | Little Depot Pond | | | | | | | | Not Sampled - No Flow | | | | | |
| OF-002 | Great Pond | | | | | | | | Not Sampled - No Flow | | | | | |
| OF-003 | Great Pond | | | | | | | | Not Sampled - No Flow | | | | | |
| OF-004 | Great Pond | | | | | | | | Not Sampled - No Flow | | | | | |

Notes

- : Not Tested (dry)

ND: Non-detect

Bold Values exceed contaminant criteria.

APPENDIX E

Catchment Ranking Table

**Stormwater Catchment Delineation
Eastham, Massachusetts**

| Catchment ID | Subcatchment ID | Receiving Water | Outfall ID | Catchment Scores | | | | | | | Outfall Scores | | | | Outfall Sampled | Outfall Score | Catchment Score | Outfall Ranking | Catchment Ranking |
|--------------------|-----------------|-------------------|------------|---|--------------------------------------|-------------------------------------|--------------------------------------|---|----------------------------------|--|---|---|--|--|-----------------------|---------------|-----------------|-----------------|-------------------|
| | | | | Density of Generating Sites | Age of Development/ Infrastructure | Historic Combined Sewers or Septic? | Aging Septic? | Receiving Water Quality | Culverted Streams? | Discharging to Area of Concern to Public Health? (Catchment) | Previous Screening Results Indicate Likely Sewer Input? | Receiving Water Quality | Frequency of Past Discharge Complaints | Discharging to Area of Concern to Public Health? (Outfall) | | | | | |
| Information Source | | | | Land Use/GIS Maps, Aerial Photography, Google Earth | Land Use Information, Town Input | Town Input, GIS Maps | Parcel Age | Impaired Waters List | GIS and Storm System Maps | GIS Maps, Town Input | Outfall inspections and sample results | Impaired Waters List | Town Input | GIS Maps, Town Input | Yes | | | | |
| Scoring Criteria | | | | High = 2 Medium = 1 Low = 0 | Older = 2 Medium = 1 Newer = 0 | Yes = 2 No Data = 1 No = 0 | Older = 2 Medium = 1 Newer = 0 | Category 4a = 2 Category 5 = 1 Others = 0 | Yes = 2 No Data = 1 No = 0 | Yes = 2 No Data = 1 No = 0 | Yes = 2 No Data = 1 No = 0 | Category 4a = 2 Category 5 = 1 Others = 0 | Frequent = 2 Occasional = 1 None = 0 | Yes = 2 No Data = 1 No = 0 | No No No Dry | | | | |
| D | 18 | Great Pond | OF-002 | 0 | 1 | 0 | 2 | 1 | 1 | 2 | 0 | 1 | 0 | 2 | No | 3 | 7 | High | High |
| D | 18 | Great Pond | OF-003 | 0 | 1 | 0 | 2 | 1 | 1 | 2 | 0 | 1 | 0 | 2 | No | 3 | 7 | High | High |
| D | 17 | Great Pond | OF-004 | 0 | 1 | 0 | 2 | 1 | 1 | 2 | 0 | 1 | 0 | 2 | No | 3 | 7 | High | High |
| D | 18 | Little Depot Pond | OF-001 | 0 | 1 | 0 | 2 | 1 | 1 | 2 | 0 | 0 | 0 | 2 | No | 2 | 7 | Low | High |

Note: Outfall IDs were populated in GIS by EP

APPENDIX F

System Vulnerability Factor (SVF) Inventory

**Appendix E – Outfall Catchment System Vulnerability Factor (SVF) Inventory
Eastham, Massachusetts
Revision Date: September 2021**

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

Presence/Absence Evaluation Criteria:

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

APPENDIX G

Field Forms and Hyperlinks to Laboratories and
Field Services Companies

Date: _____

Weather Observations: _____

Staff Onsite: _____

Photos: _____

Eastham Storm Drain Mapping Form

Structure #: _____

Map #: _____

Street Name: _____

Nearest Structure: _____
(address, bldg, utility pole, etc)

Type of Structure: _____
(outfall, culvert, inlet, etc)

Headwall?: _____
(Y/N; concrete, stone, rip rap, none)

Material: _____
(concrete, concrete FES, corrugated metal, plastic, pvc, clay, cast iron, etc)

Size & Shape of Structure: _____

(diameter, width/height)

Invert (top of headwall to bottom inside of pipe): _____

Pipe Condition/headwall condition: _____

Connectivity: _____
(from MH, CB, culvert, other)

Date: _____

Structure Number: _____

Is Crown (top inside of pipe) Above or Below Surface Water?: _____

Dry Weather Flow Conditions: _____
(weather, ground condition, flowing?)

Description of Visual Characteristics or Odors: _____

(aesthetics, deposits/stains, erosion, vegetation)

Field Screening Data:

pH: _____
Temperature: _____
Sp. Conduct.: _____
Turbidity: _____

Flag as Future Sample Location? (Y/N): _____

Sample collected for lab analysis? ** (Y/N): _____

Lab Sample ID: _____

Analyses: _____

Sampling Date/Time: _____

**** (ensure SOP for stormwater grab sampling has been followed, see Appendix F of IDDE Plan)**

Additional comments/Sketch:

Appendix G – Links to Relevant Laboratories and Field Services Companies

Local Massachusetts State Certified Laboratories:

- ESS Laboratory; Cranston, RI <http://www.esslaboratory.com/>
- Alpha Analytical Labs; Westborough, MA <https://alphalab.com/>
- G&L Laboratories; Quincy, MA <http://www.gllab.com/>
- MassDEP Searchable Laboratory Certification Listing
<https://eeaonline.eea.state.ma.us/DEP/Labcert/Labcert.aspx>

Local Field Equipment Suppliers

- U.S. Environmental; Waltham, MA <https://usenvironmental.com/>
- Pine Environmental; Woburn, MA <http://www.pine-environmental.com/locations/?list>
- Hach Company Analytical Instruments <https://www.hach.com/>

CCTV/Video Inspection Companies

- National Water Main Cleaning Co.; Canton, MA <https://nwmcc.com/>
- BMC Corp.; Billerica, MA <https://pipejetter.com/cctv-inspection.html>
- Inland Waters Inc.; Johnston, RI <http://www.inlandwatersinc.com/>

APPENDIX H

New England Interstate Water Pollution
Control Commission IDDE Manual

ILLICIT DISCHARGE DETECTION AND ELIMINATION MANUAL

A Handbook for Municipalities



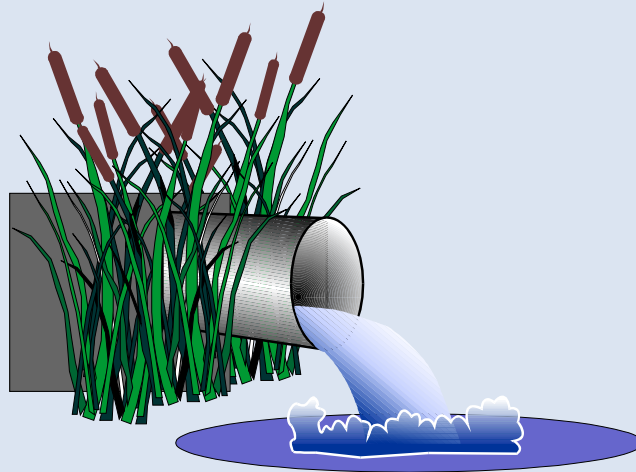
NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION

January 2003

This page is intentionally blank.

ILLICIT DISCHARGE DETECTION AND ELIMINATION MANUAL

A Handbook for Municipalities



Prepared by the
NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION
Boott Mills South
100 Foot of John Street
Lowell, Massachusetts 01852

Ronald F. Poltak, *Executive Director*

COMPACT MEMBER STATES

Connecticut
Maine
Massachusetts
New Hampshire
New York
Rhode Island
Vermont

Copies of this document may be downloaded from www.neiwpc.org.

January 2003

ACKNOWLEDGEMENTS

This manual was developed by the New England Interstate Water Pollution Control Commission (NEIWPCC). NEIWPCC is a nonprofit interstate agency, established by an Act of Congress in 1947, that serves its member states (Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont) by providing coordination, public education, training, and leadership in the management and protection of water quality.

This project was initiated by NEIWPCC's Storm Water Workgroup, which is composed of state and federal environmental agency staff. The group perceived a need for resources to help municipalities in NEIWPCC-member states that are regulated under the U.S. Environmental Protection Agency's (EPA's) Phase II storm water program comply with regulatory requirements. This manual is intended to help municipalities develop illicit discharge detection and elimination programs—one of the six minimum control measures under Phase II.

This manual was made possible by a grant from the U.S. Environmental Protection Agency. The contents do not necessarily reflect the views and policies of EPA or NEIWPCC's member states, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

This manual was compiled and written by Rebekah Lacey, with assistance from Kim Starbuck and other NEIWPCC staff. Editing, graphic design, and layout were performed by Ellen Frye and Ricki Pappo of ENOSIS. Thelma Murphy served as the EPA Project Officer. NEIWPCC would like to thank Andrea Donlon, NHDES, for her many contributions to this document, which included providing information, comments, and photographs—most of the photographs in the manual were either provided by Andrea or taken by NEIWPCC staff while accompanying Andrea on field work.

NEIWPCC would also like to thank the following people who contributed their time in providing information for and/or reviewing the manual:

Interviews or Other Information

Kathy Baskin, Charles River Watershed Association
Paul Barden, BWSC
Michael Cuneo, Town of Dedham, MA
Andrea Donlon, NHDES
Tim Grover, City of Winooski, VT
Charlie Jewell, BWSC
Natalie Landry, NHDES
Ginny Scarlet, MADEP

Review

Jeff Andrews, NHDES
Andrea Donlon, NHDES
Bryant Firmin, MADEP
Greg Goblick, RIDEM
Tim Grover, City of Winooski, VT
David Ladd, MEDEP
Steve Lipman, MADEP
Thomas Mahin, MADEP
Thelma Murphy, USEPA
Jim Pease, VTDEC
Ginny Scarlet, MADEP
Chris Stone, CTDEP

CONTENTS

| | |
|--|-----------|
| ACKNOWLEDGEMENTS | 4 |
| CONTENTS | 5 |
| ACRONYMS | 7 |
| INTRODUCTION | 9 |
| Who Administers the Phase II Storm Water Program? | 9 |
| What Is Regulated Under Phase II? | 9 |
| Where Does IDDE Fit In? | 10 |
| About This Manual | 10 |
| 1 GETTING STARTED WITH YOUR IDDE PROGRAM | 11 |
| What Is an Illicit Discharge? | 11 |
| What Are the Elements of an IDDE Program? | 11 |
| References: Chapter 1 | 12 |
| 2 DEVELOPING A STORM SEWER MAP | 13 |
| Conducting a Field Survey | 13 |
| Mapping Options | 13 |
| Figure 1: Sample Map | 15 |
| Prioritizing Areas to be Mapped | 15 |
| References: Chapter 2 | 16 |
| 3 PROHIBITING ILLICIT DISCHARGES | 17 |
| Illicit Discharge Ordinances | 17 |
| References: Chapter 3 | 18 |
| 4 DEVELOPING AND IMPLEMENTING AN IDDE PLAN: LOCATING PRIORITY AREAS | 19 |
| Identifying Possible Hot Spots | 19 |
| Conducting Dry-Weather Outfall/Manhole Surveys | 20 |
| Conducting Water Quality Tests | 22 |
| Table 1: Water Quality Test Parameters and Uses | 23 |
| References: Chapter 4 | 24 |

| | | |
|---|--|-----------|
| 5 | DEVELOPING AND IMPLEMENTING AN IDDE PLAN: TRACING THE SOURCE OF AN ILLICIT DISCHARGE | 25 |
| | Manhole Observations | 25 |
| | Video Inspection | 26 |
| | Smoke Testing | 26 |
| | Dye Testing | 26 |
| | Aerial Infrared and Thermal Photography | 27 |
| | Tracking Illegal Dumping | 28 |
| | References: Chapter 5 | 29 |
| 6 | DEVELOPING AND IMPLEMENTING AN IDDE PLAN: REMOVING THE SOURCE OF AN ILLICIT DISCHARGE | 31 |
| | Compliance Assistance and Enforcement for Illegal Connections to Homes and Businesses | 31 |
| | Proper Construction and Maintenance of MS4s | 33 |
| | Preventing and Responding to Illegal Dumping | 34 |
| | References: Chapter 6 | 35 |
| 7 | DEVELOPING AND IMPLEMENTING AN IDDE PLAN: EVALUATION OF THE IDDE PROGRAM | 37 |
| | Evaluation Strategy | 37 |
| | References: Chapter 7 | 38 |
| 8 | OUTREACH TO EMPLOYEES, BUSINESSES, AND THE GENERAL PUBLIC | 39 |
| | Public Employees | 39 |
| | Businesses | 40 |
| | General Public | 40 |
| | References: Chapter 8 | 41 |
| 9 | BMPS AND MEASURABLE GOALS FOR IDDE | 43 |
| | Getting Started | 43 |
| | References: Chapter 9 | 45 |
| 10 | RESOURCES | 47 |
| | Web Sites and Publications | 47 |
| | Contacts | 51 |
| APPENDIX A: MODEL ILLICIT DISCHARGE AND CONNECTION STORM WATER ORDINANCE | | 53 |

ACRONYMS

| | |
|--------------|---|
| BMP | Best Management Practice |
| BWSC | Boston Water and Sewer Commission |
| GIS | Geographic Information System |
| GPS | Global Positioning System |
| IDDE | Illicit Discharge Detection and Elimination |
| MS4 | Municipal Separate Storm Sewer System |
| NPDES | National Pollutant Discharge Elimination System |
| NOV | Notice of Violation |
| SIC | Standard Industrial Classification |

| | |
|---------------|---|
| EPA | U.S. Environmental Protection Agency |
| CTDEP | Connecticut Department of Environmental Protection |
| MEDEP | Maine Department of Environmental Protection |
| MADEP | Massachusetts Department of Environmental Protection |
| NHDES | New Hampshire Department of Environmental Services |
| NYSDEC | New York State Department of Environmental Conservation |
| RIDEM | Rhode Island Department of Environmental Management |
| VTDEC | Vermont Department of Environmental Conservation |

This page is intentionally blank.

INTRODUCTION

Although the quality of the nation's waters has improved greatly since the passage of the Clean Water Act in 1972, many water bodies are still impaired by pollution. According to the U.S. Environmental Protection Agency's (EPA's) 2000 National Water Quality Inventory, 39 percent of assessed river and stream miles, 46 percent of assessed lake acres, and 51 percent of assessed estuarine square miles do not meet water quality standards. The top causes of impairment include siltation, nutrients, bacteria, metals (primarily mercury), and oxygen-depleting substances. Polluted storm water runoff, including runoff from urban/suburban areas and construction sites, is a leading source of this impairment. To address this problem, EPA has put into place a program that regulates certain storm water discharges.

In 1990, EPA promulgated Phase I of its storm water program under the National Pollutant Discharge Elimination System (NPDES) permit provisions of the Clean Water Act. Phase I addressed storm water runoff from "medium" and "large" municipal separate storm sewer systems (MS4s) generally serving populations of 100,000 or greater, construction activity that would disturb five or more acres of land, and 10 categories of industrial activity. To further reduce the adverse effects of storm water runoff, EPA instituted its Storm Water Phase II Final Rule on December 8, 1999.

WHO ADMINISTERS THE PHASE II STORM WATER PROGRAM?

The Phase II storm water program is part of EPA's NPDES program, which in many states is delegated to state authorities to administer. Connecticut, Maine, New York, Rhode Island, and Vermont are authorized to serve as NPDES permitting authorities. EPA Region 1 serves as the permitting authority for Massachusetts and New Hampshire. EPA is also the permitting authority for all federally recognized Indian Country lands and for federal facilities in Massachusetts, New Hampshire, and Vermont.

WHAT IS REGULATED UNDER PHASE II?

Phase II regulates discharges from small MS4s located in "urbanized areas" (as delineated by the Census Bureau in the most recent census) and from additional small MS4s designated by the permitting authority. Phase II also regulates construction activities that would disturb between one and five acres of land. In addition, the Phase II Final Rule ends the temporary exemption from Phase I requirements for some municipally operated industrial activities¹ and revises the "no exposure" provision for Phase I-regulated industrial activities.

MS4s are typically operated by municipalities, but the Phase II definition of "municipal separate storm sewer systems" includes storm sewer systems owned or operated by other public bodies (e.g., states, counties, Indian tribes, departments of transportation, universities). EPA also notes that an MS4 is not always just a system of underground pipes; it can include roads with drainage systems, gutters, and ditches.

Polluted storm water runoff, including runoff from urban/suburban areas and construction sites, is a leading source of water quality impairment. To address this problem, EPA has put into place a program that regulates certain storm water discharges.

¹ This temporary exemption was provided by the Intermodal Surface Transportation Act (ISTEA) of 1991.

The rules for determining which small MS4s are regulated under Phase II are somewhat complex; MS4 operators should consult the NPDES permitting authority for their state to determine whether their MS4s are regulated. Note also that requirements may be different if a municipality is located only partially within an urbanized area.

WHERE DOES IDDE FIT IN?

EPA's Phase II rule specifies that permitting authorities must issue general permits for "automatically designated" small MS4s by December 9, 2002. The rule requires that operators of these automatically designated small MS4s apply for NPDES permit coverage within 90 days of permit issuance, and no later than March 10, 2003². To obtain this coverage, an MS4 operator must develop, implement, and enforce a storm water management program that is designed to reduce the discharge of pollutants to the maximum extent practicable, protect water quality, and satisfy the applicable water quality requirements of the Clean Water Act. EPA's Storm Water Phase II Final Rule states that this storm water management program must include the following six minimum control measures:

- Public education and outreach on storm water impacts
- Public involvement and participation
- **Illicit discharge detection and elimination (IDDE)**
- Construction site storm water runoff control
- Post-construction storm water management in new development and redevelopment
- Pollution prevention and good housekeeping for municipal operations

As part of their applications for permit coverage, MS4 operators must identify the best management practices they will use to comply with each of the six minimum control measures and the measurable goals they have set for each measure.

ABOUT THIS MANUAL

This manual is intended to help municipalities in the New England states and New York develop illicit discharge detection and elimination (IDDE) programs required by EPA's Phase II storm water program. EPA's Phase II storm water regulations provide guidelines that are used by permitting authorities in writing their permits. This manual provides general information based on EPA's Phase II storm water regulations; it is important to consult the permitting authority in your state (see Chapter 10) to find out about state-specific requirements.

Chapter 1 explains the IDDE requirement of EPA's Phase II regulations. Chapters 2 through 8 describe the required elements of an IDDE program and provide information to help municipalities execute each of these elements. Chapter 9 provides information on best management practices and measurable goals for IDDEs. Chapter 10 lists additional resources and contacts that may be helpful in developing an IDDE program.

EPA's Phase II storm water regulations provide guidelines that are used by permitting authorities in writing their permits. This manual provides general information based on EPA's Phase II storm water regulations; it is important to consult the permitting authority in your state to find out about state-specific requirements.

² There are some exceptions to this deadline; contact the permitting authority in your state for up-to-date official information.

1

GETTING STARTED WITH YOUR IDDE PROGRAM

As you set out to develop your illicit discharge detection and elimination (IDDE) program, you will need to start by making sure that you know the answers to two key questions: (1) What is an illicit discharge? and (2) What are the required elements of an IDDE program? In this chapter we'll review the answers to these questions; we'll provide supporting information and details in subsequent chapters.



WHAT IS AN ILLICIT DISCHARGE?

The term “illicit discharge” is defined in EPA’s Phase II storm water regulations as “any discharge to a municipal separate storm sewer that is not composed entirely of storm water, except discharges pursuant to an NPDES permit and discharges resulting from fire-fighting activities.”

Illicit discharges can be categorized as either direct or indirect.

- Examples of direct illicit discharges:
 - sanitary wastewater piping that is directly connected from a home to the storm sewer
 - materials (e.g., used motor oil) that have been dumped illegally into a storm drain catch basin
 - a shop floor drain that is connected to the storm sewer
 - a cross-connection between the municipal sewer and storm sewer systems
- Examples of indirect illicit discharges:
 - an old and damaged sanitary sewer line that is leaking fluids into a cracked storm sewer line
 - a failing septic system that is leaking into a cracked storm sewer line or causing surface discharge into the storm sewer

Illicit discharge

Any discharge to a municipal separate storm sewer that is not composed entirely of storm water, except discharges pursuant to an NPDES permit and discharges resulting from fire-fighting activities.

WHAT ARE THE ELEMENTS OF AN IDDE PROGRAM?

EPA’s Phase II regulations state that an IDDE program must incorporate the following four elements.

- Develop (if not already completed) a storm sewer system map showing the location of all outfalls, and the names and location of all waters of the United States that receive discharges from those outfalls.

NON-STORM WATER DISCHARGES THAT YOUR IDDE PROGRAM MAY NOT NEED TO ADDRESS

According to EPA's Phase II storm water regulations, an illicit discharge detection and elimination program need only address the following categories of non-storm water discharges if the operator of a small MS4 identifies them as significant contributors of pollutants to the MS4:

- water line flushing
- landscape irrigation
- diverted stream flows
- rising ground waters
- uncontaminated ground water infiltration
- uncontaminated pumped ground water
- discharges from potable water sources
- foundation drains
- air conditioning condensation
- irrigation water
- springs
- water from crawl space pumps
- footing drains
- lawn watering
- individual residential car washing
- flows from riparian habitats and wetlands
- dechlorinated swimming pool discharges
- street wash water

- To the extent allowable under state, tribal, or local law, effectively prohibit through ordinance, or other regulatory mechanism, illicit discharges into the separate storm sewer system and implement appropriate enforcement procedures and actions as needed.
- Develop and implement a plan to detect and address illicit discharges, including illegal dumping, to the system.
- Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

For each of these mandatory elements, EPA suggests a variety of approaches that can help in creating a successful IDDE program. The mandatory elements and the suggested approaches will be discussed further in the next seven chapters.

REFERENCES: CHAPTER 1

- USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. <http://www.epa.gov/npdes/regulations/phase2.pdf>
- USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.5: *Illicit Discharge Detection and Elimination Minimum Control Measure*. EPA 833-F-00-007. January 2000. <http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>

2

DEVELOPING A STORM SEWER MAP

The creation of a storm sewer map is the first mandatory element of an IDDE program. Phase II requires that the operator of a regulated MS4 develop a map of the MS4 that shows, at a minimum, the location of all outfalls and the names and locations of all waters of the United States that receive discharges from those outfalls. While many municipalities in the Northeast already have detailed maps of their storm sewer systems, others, typically those in older or more rural areas, have the information scattered in different locations. These municipalities will have the most work to do to comply with this requirement. If you need to develop a map, begin by collecting any existing information on outfall locations (e.g., review city records, drainage maps, storm drain maps, state or federal storm water permit files, state transportation maintenance maps), and then conduct field surveys to verify the locations.



CONDUCTING A FIELD SURVEY

A field survey of outfall locations will often be necessary to create a map or verify and update an existing map. The References section at the end of the chapter provides a Web link for a sample guide for conducting a storm drain mapping survey (MA DFWELE, 2002). Field outfall surveys generally include the following basic steps:

- ▶ Survey receiving waters on foot or by boat to look for all outfalls (i.e., wade small receiving waters or use a boat for larger receiving waters).
- ▶ Note the locations of outfalls on a map. The map scale should be such that outfalls can be located accurately.
- ▶ Assign a code or label to each outfall. Adopt a logical, easy-to-understand system (e.g., distance along the stream).
- ▶ Fill out a survey sheet for each outfall, noting characteristics such as dry weather discharge and deposits or stains.

MAPPING OPTIONS

For municipalities that do not already have a storm sewer map, it is important to determine the type of map (e.g., topographic, hand or computer drafted) that best fits your needs. Because there is no specific mapping standard in the Phase II rule, the goal of a mapping program should be functionality—find a way to map outfalls such that you

The goal of a mapping program should be functionality—find a way to map outfalls such that you (and the permitting authority) can locate any specific outfall to check on discharges.

CAN A DITCH BE AN OUTFALL?

The paragraph below is an excerpt from EPA's Storm Water Phase II Final Rule (USEPA, 1999).

The term "outfall" is defined in 40 CFR 122.26(b)(9) as "a point source at the point where a municipal separate storm sewer discharges to waters of the United States." The term "municipal separate storm sewer" is defined at 40 CFR 122.26(b)(8) as "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains)." Following the logic of these definitions, a "ditch" may be part of the municipal separate storm sewer, and at the point where the ditch discharges to waters of the United States, it is an outfall. As with any determination about jurisdictional provisions of the CWA, however, final decisions require case-specific evaluations of fact.

(and the permitting authority) can locate any specific outfall to check on discharges. The most basic way to meet the mapping requirement is to use an existing map (e.g., a topographic map) that shows receiving waters. You can then mark outfall locations on the map by hand (using existing information augmented by a field survey). Make sure the names of receiving waters are shown on the map; for receiving waters that don't have names, it is helpful to indicate the nearest named water body downstream. The graphic at the beginning of this chapter shows an example of a marked-up United States Geological Survey map (markings do not represent actual outfalls). The next step up is a more sophisticated paper map (e.g., blueprint-style). Figure 1 presents an example of a simple paper map showing outfalls and other key features of the storm sewer system.



In many municipalities, a paper map may be completely adequate for carrying out an IDDE program. However, if your MS4 has the resources, or if your municipality has a complex storm sewer system, you may want to make use of available computer technology in making your map.

Global Positioning System (GPS) technology can be used to obtain the coordinates (longitude and latitude) for each outfall. A GPS unit, which uses data from the U.S. Department of Defense's constellation of GPS satellites to constantly update position, can be carried with you on your field survey. A particular position can be recorded and later downloaded into a Geographic Information System (GIS) database. Using GIS, the coordinates can be linked with other site-specific information, such as a picture and history of the outfall. GPS units can be purchased or rented.

There are various computerized mapping programs. A GIS program (e.g., ArcGIS) combines a georeferenced database with mapping capability, so that different geographical attributes (e.g., streets, outfalls, land use, monitoring data) can be mapped as

“layers” and displayed either separately or together. AutoCAD®, a design/drafting platform, is another program commonly used for storm sewer mapping.

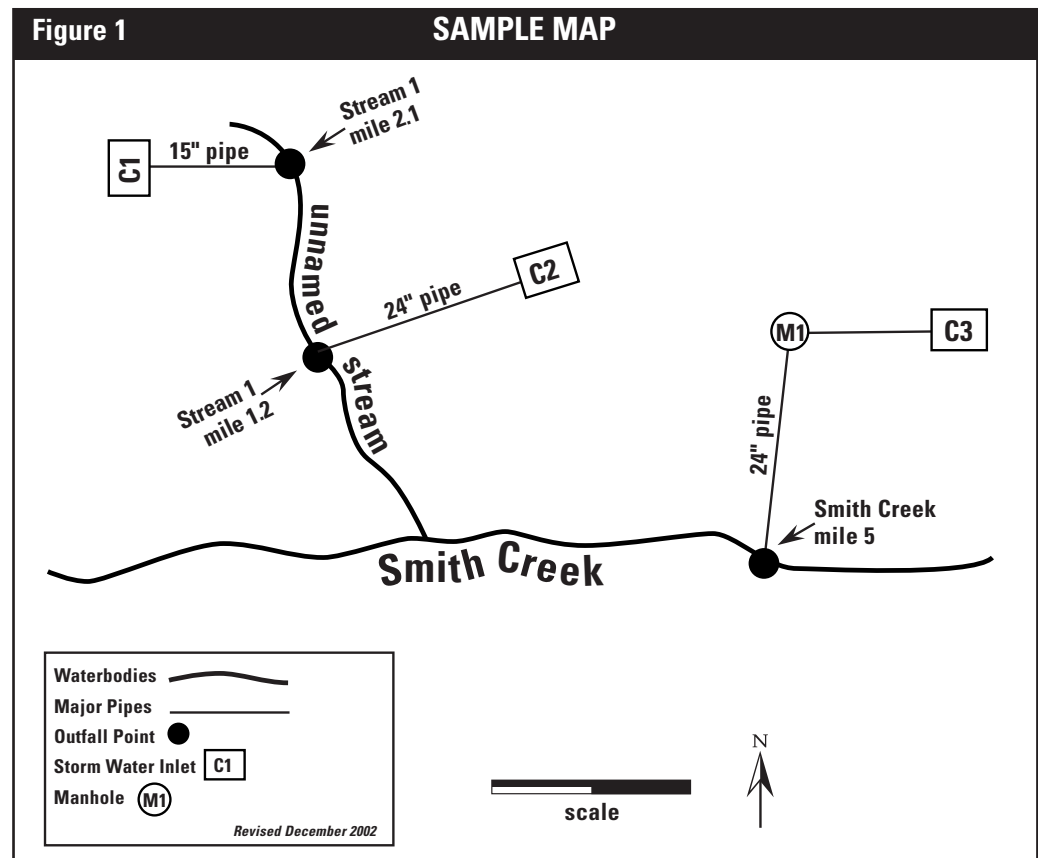
If you plan to map via computer, decide if you want to make the mapping system compatible with other departments within your municipality and/or with other data sources (e.g., state agencies that provide GIS layers). Since storm sewer systems are often constructed in roadways, the use of the GIS road line data layer can be helpful in developing a map. If this layer is available, it is usually very accurate and frequently updated by state or regional agencies. Local or regional planning commissions may be able to provide assistance with GIS technology and map development. Once a particular software system has been chosen, it is helpful to require developers to submit compatible electronic updates for subsequent development to ensure that the map and data remain current after the initial mapping effort is finished.

PRIORITIZING AREAS TO BE MAPPED

You may find that practical considerations will dictate the need to conduct mapping in phases. In this case, it is best to prioritize your mapping agenda. For example, older developed areas are more likely to have illicit discharges than newer areas for various reasons (e.g., many municipalities have imposed inspection requirements on new construction that help to prevent illegal connections). Therefore, if your community has limited resources, you would benefit from mapping the older areas first to ensure that priority areas are mapped.

You may find that practical considerations will dictate the need to conduct mapping in phases. In this case, it is best to prioritize your mapping agenda.

Other considerations in setting mapping priorities include land uses, reports of illicit discharges, and other information specific to each MS4. Although EPA’s Phase II regulations require that only outfalls be mapped, once an illicit discharge is detected at an outfall, it may be necessary to map the portion of the storm sewer system leading to the outfall so that you are able to locate the source of the discharge. If possible, mapping the entire storm sewer system may prove very helpful to your IDDE program.





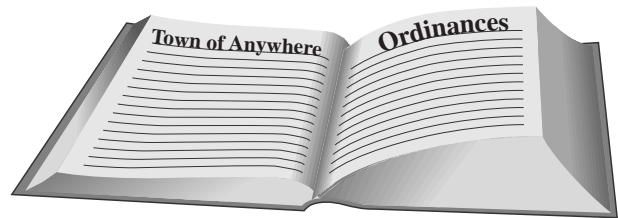
REFERENCES: CHAPTER 2

- Colorado Department of Public Health and Environment, Water Quality Control Division. 2001. *Colorado's Phase II Municipal Guidance: A guide to application requirements and program development for coverage under Colorado's Phase II municipal stormwater discharge permit.* <http://www.cdphe.state.co.us/wq/PermitsUnit/wqcdpmt.html>
- Massachusetts Division of Fisheries, Wildlife, and Environmental Law Enforcement. 2002. *Storm Drain Mapping Project Field Manual (Draft).* <http://www.state.ma.us/dfwele/River/pdf/rivstormdrainmanual.pdf>
- Oakland County, Michigan. 2002. *Illicit Discharge Elimination Program.* http://www.co.oakland.mi.us/drain/program_service/illicit_disch.html
- Pitt, R., M. Lalor, R. Field, D.D. Adrian, and D. Barbe. 1993. *Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems: A User's Guide.* USEPA Office of Research and Development. EPA/600/R-92/238. <http://www.epa.gov/clariton>
- Rohrer, C.A., and Beckley, R.J. Undated. *Using GIS Tools to Implement an Illicit Discharge Elimination Program in Livonia, Michigan.* Rouge River Demonstration Project. <http://www.rougeriver.com/proddata>
- USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. <http://www.epa.gov/npdes/regulations/phase2.pdf>

3

PROHIBITING ILLICIT DISCHARGES

The second mandatory element of a Phase II IDDE program requires that MS4 operators “to the extent allowable under State, Tribal, or local law, effectively prohibit through ordinance, or other regulatory mechanism, illicit discharges into the separate storm sewer system and implement appropriate enforcement procedures and actions as needed.”



ILLICIT DISCHARGE ORDINANCES

As EPA’s guidance specifies, a municipal ordinance created to comply with Phase II regulations must include a *prohibition* of illicit discharges and an *enforcement* mechanism. Note that it is also essential for the municipality to establish legal authority to inspect properties suspected of releasing contaminated discharges into the storm sewer system. Your municipality may already have a sewer use ordinance or similar bylaw that meets Phase II requirements, or that can be amended to meet the requirements. Consult with your town counsel and other municipal authorities to review your town’s existing bylaws and regulations and determine what changes or additions are needed and what the procedure is for making those changes. If you need to make changes, you may want to review the model bylaws and other guidance discussed below.

EPA’s nonpoint source pollution program Web site offers several examples of local ordinances for illicit discharges (USEPA, 2002). Appendix A of this manual presents EPA’s general model ordinance, which synthesizes a number of existing municipal ordinances. In using any of these ordinances as a model, a community should take into account the legal authority granted to it under state law, the Phase II permit requirements in that state, the enforcement methods it deems appropriate, and any other locality-specific considerations.

A workgroup chaired by Massachusetts Department of Environmental Protection (MADEP) staff has been working on developing model bylaws that municipalities in the state can use to help them comply with Phase II regulations. The products of this group’s work (model bylaws and associated guidance) are expected to be available on the MADEP Web site (see Chapter 10) by the time this manual is published. This group found that many of the available model ordinances did not fit well with the structure of Massachusetts government and, therefore, developed models that would work for towns in the state. The group also found that entry onto private property can be a tricky legal issue and should be treated carefully in any new or amended bylaws.

A municipal ordinance created to comply with Phase II regulations must include a prohibition of illicit discharges and an enforcement mechanism.

The Boston Water and Sewer Commission’s (BWSC’s) *Regulations Governing the Use of Sanitary and Combined Sewers and Storm Drains* are available on the Web (<http://www.bwsc.org>; click on “Engineering” then “Regulations”) and may serve as a useful local model. The regulations specify certain conditions under which BWSC

representatives must be granted access to property; denial of access may lead to termination of water service.

Note that illicit discharges to *storm* sewers should be addressed hand-in-hand with the issue of illegal connections of extraneous water to *sanitary* sewers (typically referred to as infiltration/inflow or I/I programs); bylaws or regulations should make clear which discharges belong in which system.

REFERENCES: CHAPTER 3

BWSC. 2002. *Regulations Governing the Use of Sanitary and Combined Sewers and Storm Drains*.
<http://www.bwsc.org>

Personal communication from Ginny Scarlet, MADEP, November 29, 2002.

USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851.

USEPA. 2002. *Model Ordinances to Protect Local Resources: Illicit Discharges*.
<http://www.epa.gov/owow/nps/ordinance/discharges.htm>

4

DEVELOPING AND IMPLEMENTING AN IDDE PLAN: LOCATING PRIORITY AREAS

Developing and implementing a plan to detect and address illicit discharges is the third mandatory element of a Phase II IDDE program. EPA recommends that the plan include the following four components: locating priority areas; tracing the source of an illicit discharge; removing the source of an illicit discharge; and program evaluation and assessment. The first component, locating priority areas, is the subject of this chapter. Each of the other three components will be discussed in chapters five, six, and seven respectively.

THE IDDE PLAN

- Locating priority areas
- Tracing the source of an illicit discharge
- Removing the source of an illicit discharge
- Program evaluation and assessment

The process of identifying “priority areas” can be broken down into three steps:

- *Use available information to identify potential hot spots*
- *Conduct dry-weather field screening to look for non-storm water discharges*
- *Conduct water quality tests to see if these non-storm water discharges seem to be illicit discharges*

The following sections focus on each of these approaches.

IDENTIFYING POSSIBLE HOT SPOTS

“Hot spots” are areas that are considered to be likely sources of illicit discharges, based on available information. The following list provides examples of potential hot spots.

Commercial/ industrial areas These areas have been found in some communities’ IDDE programs to (a) have significant numbers of illicit connections and/or (b) have discharges with a high potential to affect water quality (Tuomari, 1999 and Pitt et al., 1993). Specific business sectors can be prioritized (e.g., businesses subject to waste water pretreatment rules, businesses falling under certain Standard Industrial Classification [SIC] codes, or business sectors with a record of enforcement actions).

Older areas of town Older development may predate more stringent construction codes regarding illegal connections and may have deteriorating sewer and/or storm sewer infrastructure that can lead to infiltration problems.



Hot spots

Areas that are considered to be likely sources of illicit discharges, based on available information.

Areas where there have been repeated complaints Areas where illegal dumping or apparently contaminated discharges have been reported are obvious priority targets. Geographic Information System (GIS) mapping can be useful for visualizing complaint locations. These maps can be overlain with other pertinent resource information (e.g., locations of facilities that have had compliance violations, water quality data for receiving waters).

Locations identified from ambient water quality sampling data

The locations of high levels of particular contaminants (e.g., bacteria) can help to target priority outfalls. Good resources for this information are the periodic water quality assessment reports (“305(b) reports”) and lists of impaired waters (“303(d) lists”) that the Clean Water Act requires each state to prepare and submit to EPA. These reports are prepared by each state’s environmental agency and are available to the public, often on the state’s Web site. Also, local watershed groups monitor many water bodies, particularly those in more developed areas. In addition to providing sampling data, these groups can often serve as valuable resources for information about a particular water body and potential problem areas. Other possible sources of water quality data include local Boards of Health (in Massachusetts, they must test at beaches) and water districts or departments.



CONDUCTING DRY-WEATHER OUTFALL/MANHOLE SURVEYS

Once your general geographic priority areas have been determined, dry-weather surveys of outfalls and/or manholes can be undertaken to look for non-storm water flows.

EPA recommends that you make visual observations of outfalls during dry weather. Some operators have found that dry-weather manhole inspections can also be useful. The presence of flow in a storm sewer outfall or manhole during dry weather indicates a likely illicit discharge. (Other explanations for the presence of such flow include infiltrating ground water or the diversion of a surface stream into the storm sewer system.) Because illicit discharges are often intermittent, you should ideally check for discharges multiple times in a given location (particularly in a priority location). Please note that only those with confined-space training should enter a manhole or outfall. The observation and sampling strategies described below can typically be conducted without entering manholes or outfalls.

IMPORTANT NOTE:

Only those with confined-space training should enter a manhole or outfall.

In implementing your dry-weather survey, consider adopting the following strategies.

- Combine this survey with the outfall mapping field survey (see Chapter 2) and/or water quality sampling of the discharges (discussed in the next section of this chapter).
- Enlist a watershed association or other volunteer organization to help with the outfall survey.
- Notify the public that the survey will be taking place (e.g., send notices to property owners in the area). Note that while it is desirable to keep the public informed

about the presence of survey-takers to prevent undue alarm, notification may also tip off an illegal discharger to curtail discharges; use your judgment as to the most appropriate course of action. For example, you might just specify a very general time frame during which the survey will take place.

- ▶ Keep safety considerations at the forefront of survey procedures at all times. Likely hazards should be anticipated and discussed with the individuals carrying out the survey, and individuals should be instructed to use their judgment and err on the side of caution as they conduct the survey. The survey should be conducted in groups of two or more. If manholes are opened for inspection as part of the survey, staff should wear high-visibility safety vests and block off their work area with traffic cones; police presence can be helpful for safety and to allay public concerns that can be created by individuals opening manholes.
- ▶ Determine your criterion for “dry weather.” The working definition of dry weather used for sampling programs can vary depending on location-specific factors. Pitt et al. (1993) suggest that storm-runoff drainage ends in most urban areas no more than 12 hours after a storm event, but many programs (e.g., Boston, NH DES, San Diego) use a longer time period, such as no rain or no more than 1/10 inch of rain in the last 48 or 72 hours.
- ▶ Observe dry-weather flows for odor, color, turbidity, and floatable matter. Observe outfalls for deposits and stains, vegetation, and damage to outfall structures. This information can help identify contaminants present in the discharge and/or the likely nature of the discharge (e.g., sanitary, industrial). Some of the resources listed in Chapter 10 provide examples of data and observation sheets to be filled out for each outfall.
- ▶ Look up some of the resources listed in the references for this chapter for more detailed instructions for conducting dry-weather field surveys (e.g., MA DFWELE, 2002).

CASE STUDY: BOSTON WATER AND SEWER COMMISSION

USING SANDBAGS TO DETECT ILLICIT DISCHARGES

The Boston Water and Sewer Commission has had success using sandbags to help detect illicit discharges. Sandbags are placed in storm drain outlets that empty into manholes and/or water bodies. The sandbags are small enough that they do not block the storm drain outlet. They must be placed in the outlet after 48 hours of dry weather (1/10 inch of rain or less). After the bag is placed in the outlet, another 48 hours of dry weather is needed (total of 96 hours of dry weather). The outlet is then observed, and any water buildup behind the sandbag is sampled. This method is very effective in narrowing down the manhole junctures that contain illicit discharges. Sandbags cost approximately \$60 each and can be reused. The main difficulty in using this method is the need for 96-hour periods of dry weather.

Information from an interview with Paul Barden, Deputy Director of Engineering Services, and Charlie Jewell, Project Director, Boston Water and Sewer Commission, August 15, 2002.

CONDUCTING WATER QUALITY TESTS

When dry-weather flow is observed, visual or odor observations (e.g., observation of pieces of toilet paper, strongly colored or very muddy discharge, or the odor of sewage or chemicals) may provide enough information to determine that the discharge is illicit and to identify the likely source. If not, water quality sampling can be used to determine whether the flow is likely to have resulted from an illicit discharge.

Certain water quality parameters can serve as indicators of the likely presence or absence of a specific type of discharge. Some of these parameters can be measured in the field with probes or test kits; others must be analyzed for in the laboratory. A wide variety of water quality parameters can be measured in an IDDE program, and many references exist that describe these parameters. Some of the more commonly used and useful parameters are summarized in Table 1, which focuses on parameters suggested in Pitt et al. (1993) and the subset of those recommended in EPA's Phase II regulations.



CASE STUDY: WINOOSKI, VERMONT

USE OF OPTICAL BRIGHTENERS

The city of Winooski, Vermont has found that testing for optical brighteners is an efficient, cheap way to determine the presence of a non-storm water discharge in a particular outfall. Optical brighteners are used in laundry detergents and thus serve as a marker for household or commercial laundry discharges. These tests are extremely sensitive to the presence of detergents.

To perform an optical-brightener test, an untreated cotton pad (\$9/100 pads) surrounded by a mesh bag or a suet cage is placed in a storm drain outlet, manhole, or catch basin that has been found to have dry-weather discharge and left for a certain period of time (i.e., 5-7 days). The cotton pad is then brought back to the lab and placed under a UV lamp (approximately \$200) in a dark room. A blue color indicates the presence of detergents, signifying either illegal dumping, a direct illicit connection, a leaking sewer, or leakage from a failed septic system. If the test is positive for detergents, further tests need to be performed to determine the source.

Information from an interview with Tim Grover, Water Pollution Control Facility Superintendent, City of Winooski, August 9, 2002.

TABLE 1 WATER QUALITY TEST PARAMETERS AND USES

| Water Quality Test | Use of Water Quality Test | Comments |
|---|---|---|
| Conductivity | Used as an indicator of dissolved solids | - Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter - Typically measured in the field with a probe |
| Ammonia | High levels can be an indicator of the presence of sanitary wastewater | - Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter - Used very often and equipment is readily available; Boston, MA uses a field test kit (see case example) |
| Surfactants | Indicate the presence of detergent (e.g., laundry, car washing) | - Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter - Boston, MA uses a field test kit (see case example) |
| pH | Extreme pH values (low or high) may indicate commercial or industrial flows; not useful in determining the presence of sanitary wastewater (which, like uncontaminated baseflows, tends to have a neutral pH, i.e., close to 7) | - Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter - Typically measured in the field or lab with a probe |
| Temperature | Sanitary wastewater and industrial cooling water can substantially influence outfall discharge temperatures. This measurement is most useful during cold weather. | - Pitt et al. 1993 suggested parameter - Measured in the field with a thermometer or probe |
| Hardness | Used to distinguish between natural and treated waters | - Pitt et al. 1993 suggested parameter |
| Total Chlorine | Used to indicate inflow from potable water sources; not a good indicator of sanitary wastewater because chlorine will not exist in a "free" state in water for long (it will combine with organic compounds) | - Pitt et al. 1993 suggested parameter |
| Fluoride | Used to indicate potable water sources in areas where water supplies are fluoridated | - Pitt et al. 1993 suggested parameter |
| Potassium | High levels may indicate the presence of sanitary wastewater | - Pitt et al. 1993 suggested parameter |
| Optical Brighteners (Fluorescence) | Used to indicate presence of laundry detergents (which often contain fabric whiteners, which cause substantial fluorescence) | -Pitt et al. 1993 suggested parameter -Used by City of Winooski, VT (see case example) |
| Bacteria (fecal coliform, <i>E. coli</i>, and/or <i>enterococci</i>) | Used to indicate the presence of sanitary wastewater | - Used by NHDES (see case example in chapter 5) |

REFERENCES: CHAPTER 4

- Clark County (WA) Public Works. 2000. *Illicit Discharge Screening Project: Annual Summary 2000*.
<http://www.co.clark.wa.us/site/clean/download/2000rept.pdf>
- Colorado Department of Public Health and Environment, Water Quality Control Division. October 2001.
Colorado's Phase II Municipal Guidance: A guide to application requirements and program development for coverage under Colorado's Phase II municipal storm water discharge permit.
<http://www.cdphe.state.co.us/wq/PermitsUnit/wqcdpmt.html>
- Donlon, A. 2001. *2000 Coastal Illicit Connection Remediation Grant Program: Final Report*. New Hampshire Department of Environmental Services and New Hampshire Estuaries Project. R-WD-01-10.
<http://www.des.state.nh.us/wmb/was/nhep2000.pdf>
- Interview with Paul Barden and Charlie Jewell, BWSC, August 15, 2002.
- Interview with Andrea Donlon, NHDES, July 29, 2002.
- Interview with Tim Grover, City of Winooski, VT, August 9, 2002.
- Jewell, C. 2001. A Systematic Methodology for Identification and Remediation of Illegal Connections. Presented at the Water Environment Federation Specialty Conference 2001 *A Collection Systems Odyssey: Combining Wet Weather and O&M Solutions*. <http://www.wef.org>
- Massachusetts Division of Fisheries, Wildlife, and Environmental Law Enforcement. *Storm Drain Mapping Project Field Manual* (Draft). January 2002. www.state.ma.us/dfwele/River/pdf/rivstormdrainmanual.pdf
- North Central Texas Council of Governments. 2002. *Storm Water Management in North Central Texas: Illicit Discharge Detection and Elimination*. http://www.dfwstormwater.com/Storm_Water_BMPs/illicit.html
- Pitt, R., M. Lalor, R. Field, D.D. Adrian, and D. Barbe. 1993. *Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems: A User's Guide*. USEPA Office of Research and Development. EPA/600/R-92/238.
- San Diego Stormwater Copermittees Jurisdictional Urban Runoff Management Program. 2001. *Illicit Connection/Illicit Discharge (IC/ID) Detection and Elimination Model Program Guidance*.
http://www.projectcleanwater.org/html/model_programs.html
- Sargent, D. and W. Castonguay. 1998. *An Optical Brightener Handbook*.
http://www.mvpc.org/services_sec/mass_bays/optical_handbook.htm
- Tuomari, D. 1999. *Dos and Don'ts on Implementing a Successful Illicit Connection Program*. Rouge River Demonstration Project. <http://www.rougeriver.com/proddata>
- USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851.
- USEPA. 2002. Storm Water Phase II Menu of BMPs - *Illicit Discharge Detection and Elimination: Identifying Illicit Connections*. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/illi_2.cfm

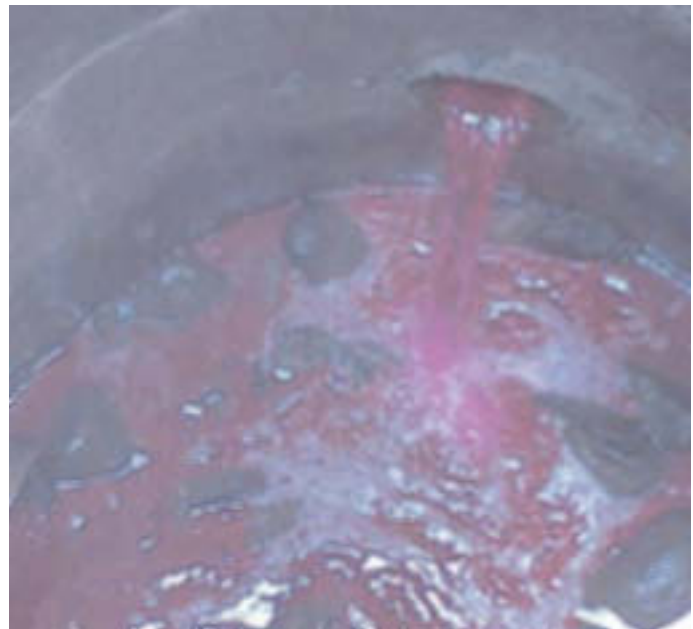
DEVELOPING AND IMPLEMENTING AN IDDE PLAN: TRACING THE SOURCE OF AN ILLICIT DISCHARGE

Developing and implementing a plan to detect and address illicit discharges is the third mandatory element of a Phase II IDDE program. EPA recommends that the plan include the following four components: (1) locating priority areas; (2) tracing the source of an illicit discharge; (3) removing the source of an illicit discharge; and (4) program evaluation and assessment. The second component, tracing the source of an illicit discharge, is the subject of this chapter.

THE IDDE PLAN

- Locating priority areas
- Tracing the source of an illicit discharge
- Removing the source of an illicit discharge
- Program evaluation and assessment

Once storm drain outlets with evidence of illicit discharges have been located, various methods can be used to pinpoint the exact source of the discharge. These techniques, many of which are already used by municipal sewer departments, include manhole observation, video inspection, smoke testing, dye testing, aerial infrared and thermal photography, and tracking illegal dumping.



MANHOLE OBSERVATIONS

A key tracing technique is to follow dry-weather flows upstream along the conveyance system to bracket the location of the source. This can be accomplished by taking the following steps:

- Consult the drainage system map.
- Check the next “upstream” manhole with a junction to see if there is evidence of discharge. You may wish to sample each manhole that has a discharge.
- Repeat these steps until a junction is found with no evidence of discharge; the discharge source is likely to be located between the junction with no evidence of discharge and the next downstream junction.
- Be aware of the surrounding areas and look for water in gutters and streets.

A key tracing technique is to follow dry-weather flows upstream along the conveyance system to bracket the location of the source.

Note that the Boston Water and Sewer Commission has had success working in the opposite direction (i.e., upstream to downstream) (Jewell 2001). Manhole observations can be time-consuming, but they are generally a necessary step before conducting other tests.

VIDEO INSPECTION

Mobile video cameras can be guided remotely through storm sewer lines to observe possible illegal connections into storm sewer systems and record observations on a videocassette or DVD. Public works staff can observe the videos and note any visible illegal connections. This technique is time-consuming and expensive but thorough and usually definitive, and it does not require the intrusion on members of the public that some of the other methods do.

SMOKE TESTING

This technique involves injecting non-toxic smoke into storm sewer lines and then noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the storm sewer lines. The injection is accomplished by placing a smoke bomb in the storm sewer manhole below ground and forcing air in after it. Smoke-generating machines can also be used. Test personnel should be stationed at points of suspected illegal connections or cracks/leaks, noting any escape of smoke (indicating an illicit connection or damaged storm sewer infrastructure). Prior to performing this test, it is necessary to inform building owners and occupants in the area in advance. It is also advisable to inform the police and fire departments.

For a more thorough smoke-test program, the sanitary sewer lines can also be smoked. For houses that do not emit smoke during either the sanitary sewer or the storm sewer system tests, sewer gas may be venting inside, which is hazardous. Interviews with various IDDE program staff suggest that the smoke-test method is more effective in infiltration/inflow investigations of the sanitary sewer system than in detecting illegal connections to the storm sewer system.

Smoke may cause minor irritation of respiratory passages; residents with respiratory conditions should receive special attention to determine if it is safe for them to be present for the testing. Smoke testing is typically used to survey an area all at once, in contrast to dye testing, which tests one building at a time.

DYE TESTING

This technique involves flushing non-toxic dye into toilets and sinks and observing storm sewer and sanitary sewer manholes and storm sewer outfalls for the presence of the dye. Prior to performing this test, it is necessary to inform building owners and occupants in advance and gain permission for entry. Local public health and state water quality staff should also be notified so that they will be prepared to respond to citizens calling about any dye observed in surface waters.

To perform the test, you need a crew of two or more people (ideally, all with two-way radios). One person is inside the building; the others are stationed at the appropriate storm sewer and sanitary sewer manholes (which



Smoke testing involves injecting non-toxic smoke into storm sewer lines and then noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the storm sewer lines.



CASE STUDY: NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES**LOCATING AND TRACING ILLICIT DISCHARGES IN NEW HAMPSHIRE COASTAL COMMUNITIES**

In 1996, the New Hampshire Department of Environmental Services (NHDES) began a program of investigating and eliminating illicit connections to storm drainage systems in coastal communities to reduce bacterial contamination in coastal waters. The following excerpt from the NHDES report on the first phase of the project describes the process used to detect and trace illicit discharges.

Beginning in the summer of 1996, the coastal shorelines were surveyed by foot or canoe at low tide for potential pollution sources. All pipes, seeps, streams, and swales with flow were sampled for bacteria. In addition, temperature was measured, and observations related to the condition of the pipe (stained or structurally damaged), odor, evidence of untreated wastewater (e.g., toilet paper), turbidity, color, debris, estimated flow, and any other observations were noted. Dry pipes were rechecked on several occasions for intermittent flow. Evidence indicating the presence of wastewater and/or elevated bacteria levels prompted further investigation of these locations.

Upstream catch basins and manholes associated with the outfall pipes that were identified by the screening process were surveyed for evidence of wastewater and sampled for bacteria. Smoke testing (using non-toxic smoke blown into catch basins) was then used to identify buildings connected to the storm drainage system by canvassing the neighborhood for vents emitting smoke. Final confirmation of an illicit connection from the buildings that emitted smoke was accomplished by dye testing indoor plumbing and observing the storm drainage and sewer systems for the presence or absence of the dye.

Feeder streams were surveyed for outfall pipes with dry-weather flow. Other potential bacteriological sources (e.g., pigeon roosting sites on bridges) were bracketed with water quality sampling stations. Where contaminated seeps and swales were suspected, the drainage area was surveyed for potential sources, such as broken sewer mains.

Landry, N. 1999. Elimination of Illicit Connections in Coastal New Hampshire Spurs Cooperation and Controversy: A Final Report to the New Hampshire Estuaries Project. New Hampshire Department of Environmental Services.

should be opened) and/or outfalls. The inside person drops dye into a plumbing fixture (i.e., toilet or sink) and runs a sufficient amount of water to move the dye through the plumbing system. The inside person then radios to the outside crew that the dye has been dropped, and the outside crew watches for the dye in the storm sewer and sanitary sewer, recording the presence or absence of the dye.

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

AERIAL INFRARED AND THERMAL PHOTOGRAPHY

Aerial infrared and/or thermal photography can be used to locate illicit discharges from outfalls and failing septic systems using temperature and vegetation as markers. This technique requires knowledge of aerial photo interpretation. Using aerial infrared or thermal photographs, do the following:

- For outfalls
 - Note if discharge has a higher temperature than that of the stream
 - Note if algae growth is concentrated near an outfall
- For potentially failing septic systems
 - Note evidence of increased moisture in surrounding soil
 - Observe vegetation located close to the potentially failing septic system, and note any increase in vegetation compared to the surrounding area
 - Observe any increase in temperature readings at the septic system location

This is still a developing technology and not commonly used for IDDE programs. You may still need further tests to determine specific houses/businesses with illegal connections. This technique has been used primarily for the detection of failing septic systems, which are only considered “illicit discharges” under the Phase II Storm Water program if they discharge into the storm sewer system.

TRACKING ILLEGAL DUMPING

Developing a coordinated system for collecting and tracking reports of illegal dumping can help pinpoint this difficult-to-find source of illicit discharges. Suggestions for tracking illegal dumping include the following:

- Create a hotline that can be used to report any illegal-dumping behavior (i.e., who illegally dumped and where illegal dumping occurred).
- Observe the materials that have been illegally dumped and trace the potential sources of the materials.
- Note where dumping occurs most often, record patterns of time of day and day of the week, and note common responsible parties.

Challenges in addressing illegal dumping include the difficulty of catching dumpers in the act and the significant staff time needed to receive, respond to, and track complaints.

Aerial infrared and/or thermal photography can be used to locate illicit discharges from outfalls and failing septic systems using temperature and vegetation as markers.

Developing a coordinated system for collecting and tracking reports of illegal dumping can help pinpoint this difficult-to-find source of illicit discharges.

REFERENCES: CHAPTER 5

- Center for Watershed Protection. *Pollution Prevention Fact Sheet: Illegal Dumping Control*.
http://www.stormwatercenter.net/Pollution_Prevention_Factsheets/IllegalDumpingControl.htm
- City of Cambridge, MA. 2002. *Cambridge Sewer and Stormwater Line Inspection and Testing Program*.
<http://www.ci.cambridge.ma.us/~TheWorks/dye.html>
- Jewell, C. 2001. A Systematic Methodology for Identification and Remediation of Illegal Connections. Presented at the Water Environment Federation Specialty Conference 2001 *A Collection Systems Odyssey: Combining Wet Weather and O&M Solutions*. <http://www.wef.org>
- Johnson, B. and D. Tuomari. 1998. *Did you know... The Impact of On-site Sewage Systems and Illicit Discharges on the Rouge River*. Rouge River Demonstration Project.
<http://www.rougeriver.com/proddata>
- Pierce County (WA) Public Works and Utilities. 2002. *BMP S.1: Eliminate Illicit Storm Drain Connections*.
<http://www.co.pierce.wa.us/pc/services/home/environ/water/swm/sppman/bmps1.htm>
- San Diego Stormwater Copermittees Jurisdictional Urban Runoff Management Program. 2001. *Illicit Connection/Illicit Discharge (IC/ID) Detection and Elimination Model Program Guidance*.
http://www.projectcleanwater.org/html/model_programs.html
- Town of Cary, NC. 2002. *Town of Cary Smoke Test*. <http://www.townofcary.org/smoke>
- Tuomari, D. 1999. *Dos and Don'ts on Implementing a Successful Illicit Connection Program*. Rouge River Demonstration Project. <http://www.rougeriver.com/proddata>
- USEPA. 2002. Storm Water Phase II Menu of BMPs - *Illicit Discharge Detection and Elimination: Failing Septic Systems*. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/illi_1.cfm
- USEPA. 2002. Storm Water Phase II Menu of BMPs - *Illicit Discharge Detection and Elimination: Identifying Illicit Connections*. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/illi_2.cfm
- USEPA. 2002. Storm Water Phase II Menu of BMPs - *Illicit Discharge Detection and Elimination: Illegal Dumping*. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/illi_3.cfm
- USEPA Region 5. 1998. *Illegal Dumping Prevention Guidebook*. EPA905-B-97-001. Waste, Pesticides, and Toxics Division, Chicago, Illinois. http://www.epa.gov/reg5rcra/wptdiv/illegal_dumping/

This page is intentionally blank.

6

DEVELOPING AND IMPLEMENTING AN IDDE PLAN: REMOVING THE SOURCE OF AN ILLICIT DISCHARGE

Developing and implementing a plan to detect and address illicit discharges is the third mandatory element of a Phase II IDDE program. EPA recommends that the plan include the following four components: (1) locating priority areas; (2) tracing the source of an illicit discharge; (3) removing the source of an illicit discharge; and (4) program evaluation and assessment. The third component, removing the source of an illicit discharge, is the subject of this chapter.

THE IDDE PLAN

- Locating priority areas
- Tracing the source of an illicit discharge
- Removing the source of an illicit discharge
- Program evaluation and assessment

Because there are various sources of illicit discharges to the storm sewer system, there are different kinds of actions municipalities may have to take to remove those sources and prevent future illicit discharges. This section groups those actions into three categories: compliance assistance and enforcement for illegal connections to homes and businesses; proper construction and maintenance of MS4s; and responding to and preventing illegal dumping.



COMPLIANCE ASSISTANCE AND ENFORCEMENT FOR ILLEGAL CONNECTIONS TO HOMES AND BUSINESSES

There is a range of ways in which municipalities may wish to handle the removal of illegal connections between homes or businesses and the storm sewer system. Enforcement measures should be spelled out in the required IDDE ordinance (see Chapter 3), but the MS4 operator will normally be allowed to use judgment about what mix of compliance assistance and enforcement actions is appropriate in a given situation. Typically, a municipality responds to the discovery of an illegal connection in a graduated manner, beginning with efforts to obtain voluntary compliance and escalating to increasingly severe enforcement actions if compliance is not obtained.

Voluntary Compliance

Often, home or business owners are not aware of the existence of illegal connections between their buildings and the storm sewer systems. In these cases, providing the responsible party with information about the connection, its environmental consequences, the applicable regulations, and how to remedy it may be enough to secure vol-

untary compliance. The cost of removing the connection and reconnecting it to the sanitary sewer system can be an obstacle. Recognizing this, some localities (e.g., Boston and coastal New Hampshire) have chosen to provide assistance with these costs, using municipal public works funds or state or federal grants.

Enforcement

EPA's model illicit discharge ordinance (Appendix A) provides an example of the enforcement steps that might be specified in a typical local ordinance. These steps are summarized below.

- The authorized enforcement agency sends the property owner a Notice of Violation (NOV), which may require the violator to take steps such as monitoring, elimination of an illicit connection or discharge, or payment of a fine.
- The person receiving the NOV may appeal it.
- If the person receiving the NOV does not appeal or loses the appeal and fails to correct the violation, the enforcement agency may “take any and all measures necessary to abate the violation and/or restore the property.” The agency then may require reimbursement from the violator for the cost of the abatement, including administrative costs.
- The authorized enforcement agency also has the ability to seek an injunction against the violator “restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.”

If the municipality has not yet obtained enforcement authority (e.g., because a local ordinance has not yet been passed), it may be possible for the municipality to seek enforcement action from state or federal authorities. Involvement of state or federal

Typically, a municipality responds to the discovery of an illegal connection in a graduated manner, beginning with efforts to obtain voluntary compliance and escalating to increasingly severe enforcement actions if compliance is not obtained.

CASE STUDY: WAYNE COUNTY, MICHIGAN

ENFORCEMENT PROCEDURE

Wayne County, Michigan, began its illicit discharge detection and elimination program by targeting certain industrial and commercial facilities for site inspections—starting at the other end of the pipe from the outfall survey approach. County personnel visited the facilities, dye tested a representative number of plumbing fixtures, and observed general “housekeeping” practices.

If no violations were found, a thank you letter was sent to the facility acknowledging staff participation and closing the file. If a facility was found to have an illicit connection, a violation letter was sent, giving the facility 30 to 90 days to correct it. If a facility failed to comply with the request, the municipal plumbing inspector or building department became involved. If the municipality was not able to gain compliance, the facility was referred to the Michigan Department of Environmental Quality. When an illicit connection was eliminated, the county provided confirmation. Once a correction was confirmed, a confirmation/thank you letter was sent to facility management, thanking them for their participation and closing the file.

Information from Tuomari, D. 1999. Dos and Don'ts on Implementing a Successful Illicit Connection Program. Technical Report of the Rouge River Demonstration Project. <http://www.rougeriver.com/proddata>

CASE STUDY: ST. LOUIS, MISSOURI

ENFORCEMENT PROCEDURE

The Metropolitan St. Louis Sewer District has a comprehensive ordinance regulating users who discharge into the sanitary sewer and storm sewer systems. Upon discovery of a violation of this ordinance, the Sewer District notifies the user of the nature of the violation and directs that actions be taken to remedy the non-compliance. Within 30 days of receipt of the notice, the user must submit a plan for correction of the violation to the Sewer District. If a violation is found within the house or business that appears to present an immediate danger to human health or welfare, a verbal notification is given immediately by telephone or visit, directing the user to take immediate action to discontinue or reduce the discharge to safe levels. A written notice is sent within five days of the verbal notification.

The Sewer District has the power to issue the following Administrative Orders: Cease and Desist Order (directing the user to stop the violating action), Compliance Order (directing the user take action to correct violation), Show Cause Order (directing the user to show cause why a proposed enforcement action should not be taken), and Consent Order (establishing an agreement with a user to correct a violation).

If the violator does not take action within the time allotted, the Sewer District has the right to eliminate the illicit discharge at the expense of the violator. Legal actions can be taken against, and penalties imposed on, any violator that does not comply.

Information from Metropolitan St. Louis Sewer District Ordinance No. 8472, on EPA's nonpoint source pollution Web site at <http://www.epa.gov/owow/nps/ordinance/discharges.htm>

authorities may also be necessary if the source of an illicit discharge is located outside of the municipality's boundaries. Examples of enforcement procedures implemented in Wayne County, Michigan, and St. Louis, Missouri, are included in this section.

PROPER CONSTRUCTION AND MAINTENANCE OF MS4s

Some illicit discharge problems may be the responsibility of the MS4 operator. These problems include cross-connections between the sanitary sewer and storm sewer systems and infiltration into damaged or deteriorating storm sewer pipes.

Cross-connections between a municipality's sanitary sewer and storm sewer systems may exist by mistake, because of deterioration over time, or as part of the design in an antiquated system. Complete and accurate maps of the sewer and storm sewer systems can help identify these cross-connections and prevent them during any new construction that takes place.

Contamination can infiltrate into a cracked or leaking MS4 from leaking sanitary sewer pipes, failing septic systems, or contaminated groundwater. To help prevent this, both MS4s and sanitary sewer systems should be inspected periodically and maintained properly to keep them in good repair.



PREVENTING AND RESPONDING TO ILLEGAL DUMPING

It is often difficult to identify and locate the individuals responsible for illegal dumping; therefore, a program to address illegal dumping should focus on prevention, backed up by enforcement to the extent possible.

EPA Region 5 has prepared an *Illegal Dumping Prevention Guidebook* that suggests the following key strategies that can be used to prevent illegal dumping.

- ▶ **Site maintenance and controls** Measures should be taken to clean up areas where illegal dumping has taken place, and controls such as signs or access restrictions should be used, as appropriate, to prevent further dumping.
- ▶ **Community outreach and involvement** Outreach is the linchpin of an illegal-dumping prevention program and can include the following components:
 - Educating businesses, municipal employees, and the general public about the environmental and legal consequences of illegally disposing of waste into the storm sewer system
 - Providing and publicizing ways for citizens to properly dispose of waste
 - Providing opportunities for citizens to get involved in preventing and reporting illegal dumping
- ▶ **Targeted enforcement** This strategy should include a prohibition against illegal dumping via ordinance or another similar measure, backed up by trained law-enforcement personnel and possibly field operations.
- ▶ **Program measurement** Tracking and evaluation methods should be used to measure the impact of illegal-dumping prevention efforts and determine whether goals are being met.

Although the EPA Region 5 guidebook is targeted more to land dumping of solid waste, these strategies can also be applied to illegal dumping into the storm drain system. Some specific methods that municipalities can use to implement these strategies include the following:

- ▶ **Site maintenance and controls**
 - Storm-drain stenciling program
 - Spill-response plans for hazardous-waste spills
- ▶ **Community outreach and involvement**
 - An illegal-dumping reporting hotline
 - Outreach to business sectors that handle hazardous materials and/or have a history of illegal-dumping problems; outreach should include information on Best Management Practices for spill prevention and proper waste disposal



- Printed outreach materials for the public
 - Publicizing of waste-disposal options, such as used oil recycling and household hazardous waste collections
- **Targeted enforcement**
- An illegal-dumping ordinance (or section of IDDE ordinance)
 - Surveillance of known illegal-dumping locations
 - Business facility inspections
 - Training of municipal employees, police officers, and other local entities to be on lookout
- **Program measurement**
- Tracking of incident locations
 - Compilation of statistics (e.g., annual cleanup costs, facility compliance, arrests, convictions, fines, complaints)

REFERENCES: CHAPTER 6

- California Coastal Commission. 2002. *Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities*. <http://www.coastal.ca.gov/la/murp.html>
- Center for Watershed Protection. *Pollution Prevention Fact Sheet: Illegal Dumping Control*. http://www.stormwatercenter.net/Pollution_Prevention_Factsheets/IllegalDumpingControl.htm
- Interview with Paul Barden and Charlie Jewell, BWSC, August 15, 2002.
- Interview with Andrea Donlon, NHDES, July 29, 2002.
- North Central Texas Council of Governments. 2002. *Storm Water Management in North Central Texas: Illicit Discharge Detection and Elimination*. http://www.dfwstormwater.com/Storm_Water_BMPs/illicit.html
- San Diego Stormwater Copermittees Jurisdictional Urban Runoff Management Program. 2001. *Illicit Connection/Illicit Discharge (IC/ID) Detection and Elimination Model Program Guidance*. http://www.projectcleanwater.org/html/model_programs.html
- USEPA. 1997. *Guidance Manual for Implementing Municipal Storm Water Management Programs – Volume 1: Planning and Administration* (Draft). Office of Wastewater Management and Office of Research and Development. <http://www.epa.gov/npdes/pubs/owm0233.pdf>
- USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. <http://www.epa.gov/npdes/regulations/phase2.pdf>
- USEPA. 2002. Storm Water Phase II Menu of BMPs - *Illicit Discharge Detection and Elimination: Illegal Dumping*. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/illi_3.cfm
- USEPA. 2002. *Model Ordinances to Protect Local Resources: Illicit Discharges*. <http://www.epa.gov/owow/nps/ordinance/discharges.htm>

This page is intentionally blank.

DEVELOPING AND IMPLEMENTING AN IDDE PLAN: EVALUATION OF THE IDDE PROGRAM

Developing and implementing a plan to detect and address illicit discharges is the third mandatory element of a Phase II IDDE program. EPA recommends that the plan include the following four components: (1) locating priority areas; (2) tracing the source of an illicit discharge; (3) removing the source of an illicit discharge; and (4) program evaluation and assessment. The fourth component, program evaluation and assessment, is the subject of this chapter.

THE IDDE PLAN

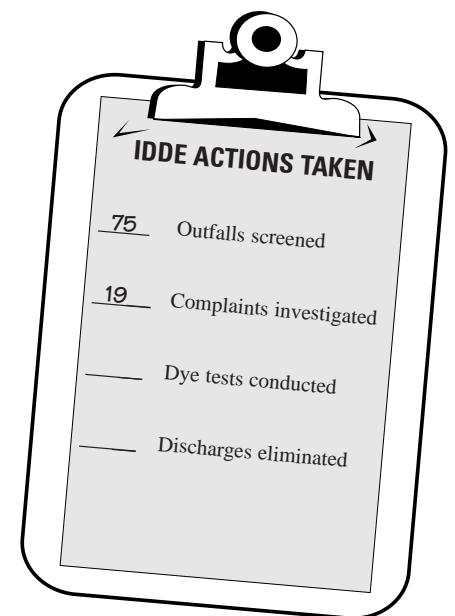
- Locating priority areas
- Tracing the source of an illicit discharge
- Removing the source of an illicit discharge
- Program evaluation and assessment

EPA recommends that the IDDE plan include procedures for program evaluation and assessment. Program evaluation is the time to step back, look at what has been done, determine what worked and what didn't, and make adjustments to planned future actions as appropriate. In this final component of your IDDE plan, you outline how you will go about evaluating your program.

EVALUATION STRATEGY

Evaluation procedures should include documentation of actions taken to locate and eliminate illicit discharges. Such documentation might include numbers of outfalls screened, complaints taken and investigated, feet of storm sewers videotaped, numbers of discharges eliminated, or number of dye or smoke tests conducted. Note that this component of the IDDE plan fits in with the overall Phase II requirements for identifying measurable goals for each Best Management Practice (BMP) and reporting on progress toward achieving those goals. (Chapter 9 discusses BMPs and measurable goals in more detail.) Annual reports are necessary during the first permit term (typically five years), and in years two and four in subsequent terms. (For more information on reporting requirements, see EPA's Fact Sheet 2.9.)

Determining the impact of these actions is more of a challenge, but it is an important part of the overall process because EPA allows for adjustments to the storm water management program over the life of the permit. Assessment of what worked and what didn't provides the information needed to make these adjustments to your IDDE program. EPA's Phase II regulations do not specify exactly how to evaluate your IDDE program, so check whether your permitting authority has made any particular specifications, and brainstorm from there.



Evaluation procedures should include documentation of actions taken to locate and eliminate illicit discharges.

Here are few suggestions for assessing the effectiveness of various IDDE strategies:

- Evaluate the number of possible illicit discharges that were detected using different detection methods. This can help you determine which detection methods are most effective.
- Evaluate the number of discharges and/or quantity of discharges eliminated using different possible enforcement and compliance measures.
- If you have access to monitoring data for receiving waters, evaluate changes in the water quality of receiving waters.
- Program evaluation might also include procedures for considering efficiency and feasibility. Questions you might want to ask include:
 - How much staff time and expense did it take to achieve a given result?
 - Were practical difficulties encountered with this approach? What were they, and how much of a problem did they present?

The strategies listed above are only suggestions. Because you are allowed a great deal of flexibility in determining what procedures you will use for program evaluation and assessment, you can decide what procedures will be most helpful in providing the information that you will need to move forward with your IDDE program.

REFERENCES: CHAPTER 7

- USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. <http://www.epa.gov/npdes/regulations/phase2.pdf>
- USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.9: *Permitting and Reporting: The Process and Requirements*. EPA 833-F-011. January 2000. <http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>
- USEPA New England. 2002. *NPDES General Permit for Storm Water Discharges from Regulated Small Municipal Separate Storm Sewer Systems (MS4s)* (Draft). September 27, 2002. <http://www.epa.gov/region01/npdes/ms4.html>

8

OUTREACH TO EMPLOYEES, BUSINESSES, AND THE GENERAL PUBLIC

The fourth mandatory element of an IDDE program calls for the MS4 operator to “inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.” As noted in the Introduction, the requirement for public education and outreach on storm water impacts is also one of the six minimum control measures in the storm water management program. Therefore, fulfilling the outreach requirement for IDDE helps the MS4 to comply with this mandatory element; IDDE outreach can be integrated into the broader storm water outreach program.



Some suggestions for conducting IDDE outreach to the different community sectors are presented below. Many examples of storm water outreach materials, including some that are intended to be modified and used by anyone, are available on the Web; some useful Web sites are listed in Chapter 10. Operators of regulated small MS4s may want to work together with other operators in their area in developing outreach materials and campaigns to share ideas and save money.

PUBLIC EMPLOYEES

While it is clear that public works employees should receive specific technical training on the requirements of the IDDE program and the techniques that will be used to carry it out, other municipal departments should also be targeted for training.

A training program for municipal employees on pollution prevention techniques is required under the “Pollution Prevention/Good Housekeeping for Municipal Operations” minimum control measure. Preventing non-storm water discharges into the storm sewer system from municipal operations can be one part of this training.

Many public employees can play an important role as partners in the detection and/or prevention of illicit discharges. For example, highway department staff who maintain catch basins can look for signs of illicit discharges. Municipal building inspectors can help ensure that illegal connections to the storm sewer system do not take place in construction and renovation projects. Police officers, public works employees, and other municipal staff whose jobs keep them outside and mobile can help spot illegal dumpers. Fire and police department personnel who respond to hazardous material spills can help keep these spills out of the storm sewer system and adjacent water bodies.

Many public employees can play an important role as partners in the detection and/or prevention of illicit discharges.

BUSINESSES

Most businesses are willing to comply with environmental requirements and take proactive steps to prevent pollution if they understand the issues and the possible solutions. Here are some steps you can take to reach out to businesses.

- ▶ Create a general brochure and presentation to inform businesses about the IDDE program. This information can be presented and/or made available at Chamber of Commerce meetings and other business forums.
- ▶ Conduct compliance assistance outreach (e.g., visits, group training, and/or printed materials) for specific business types (e.g., auto repair shops, mobile carpet cleaning, restaurants).
- ▶ Provide contractors and developers with information on preventing illegal connections (in coordination with training on construction and post-construction storm water requirements).

Most businesses are willing to comply with environmental requirements and take proactive steps to prevent pollution if they understand the issues and the possible solutions.

GENERAL PUBLIC

There are many ways in which the general public can be made aware of environmental issues and the things they can do to help mitigate or prevent problems. Here are some things you can do to inform and involve the public.

- ▶ Work with citizen groups to conduct storm-drain stenciling (e.g., “Don’t Dump – Drains to River”) and outfall surveys.
 - In conducting these activities, you should:
 - Educate the groups about their activity (either informally or via a video or other presentation)
 - Make sure volunteers understand constraints associated with storm-drain stenciling activities (e.g., heavy traffic use areas, historic districts)
 - Have volunteers sign liability forms, if necessary
 - You may also wish to:
 - Publicize the activities through the media
 - Give volunteers brochures to hand out to the public with who they interact
 - Repeat stenciling periodically (due to paint wear off), unless placards are used—stenciling on curbs lasts longer than on street surfaces
 - See Chapter 10 for information on storm-drain stenciling resources
- ▶ Create a program to promote, publicize, and facilitate public reporting of illicit connections or discharges (e.g., a hotline). Some considerations in running a hotline include:
 - Callers should be able to at least leave a message at any time of day
 - It may be helpful to have the hotline staffed during business hours
 - A system should be created for monitoring the hotline so that staff can follow up quickly on reports of discharges

If made aware of environmental issues, the general public can help mitigate or prevent problems.

- The municipality may wish to offer a small reward for callers that provide information leading to the detection of an illicit discharge source
- Distribute (by mail and by making available at various locations and events) printed outreach materials. A general flyer about illicit discharges might include information on the following:
 - Background information on water pollution
 - A definition of what constitutes an illicit discharge
 - Measures to prevent illicit discharges
 - Information about the municipality's illicit discharge ordinance
- Create Public Service Announcements for radio and/or television.
- Work with the local access cable station and local newspapers to develop features on illicit discharge prevention.
- Create and publicize a household hazardous waste disposal/recycling program.
- Provide classroom speakers and/or printed information for schools.

REFERENCES: CHAPTER 8

- Chesterfield County (VA). Undated. *Household Guide to Chesterfield County's Illicit Discharge Ordinance*. <http://www.chesterfield.gov/CommunityDevelopment/Engineering/HouseholdFactSheet.pdf>
- North Central Texas Council of Governments. 2002. *Storm Water Management in North Central Texas: Illicit Discharge Detection and Elimination*. http://www.dfwstormwater.com/Storm_Water_BMPs/illicit.html
- USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. <http://www.epa.gov/npdes/regulations/phase2.pdf>
- USEPA. 2000. *Storm Water Phase II Compliance Assistance Guide*. EPA 833-R-00-002. Office of Water. <http://www.epa.gov/npdes/pubs/comguide.pdf>
- USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.3: *Public Education and Outreach Minimum Control Measure*. EPA 833-F-00-005. January 2000. <http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>
- USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.8: *Pollution Prevention/Good Housekeeping Minimum Control Measure*. EPA 833-F-00-010. January 2000. <http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>
- USEPA. 2002. Storm Water Phase II Menu of BMPs – *Public Education and Outreach on Storm Water Impacts*. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/pub_ed.cfm
- USEPA. 2002. Storm Water Phase II Menu of BMPs – *Public Education and Outreach on Storm Water Impacts: Proper Disposal of Household Hazardous Wastes*. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/edu_5.cfm

This page is intentionally blank.

9

BMPS AND MEASURABLE GOALS FOR IDDE

As mentioned in the Introduction, operators of regulated small MS4s generally must submit applications for Phase II storm water general permits by March 10, 2003. As part of their application, they must identify best management practices (BMPs) that they will use to comply with each of the six minimum control measures, and the measurable goals that they will use to demonstrate BMP implementation. Within the first permit term, the operators have to fully implement their storm water management programs.



GETTING STARTED

EPA allows MS4 operators a great deal of flexibility in determining what BMPs are most appropriate for their storm water programs. The agency has developed the following materials to assist operators in identifying appropriate BMPs:

- ▶ *A National Menu of Best Management Practices for Storm Water Phase II*, which includes a toolkit of example BMPs for each of the Phase II minimum control measures (available on the Web)
- ▶ *Measurable Goals Guidance for Small MS4s*
- ▶ *A Storm Water Phase II Compliance Guide*, which offers examples of BMPs and measurable goals for each of the six minimum measures

Others, including states, regional agencies, trade associations, and non-profit organizations have also developed BMP information.

A sample list of IDDE BMPs and measurable goals is presented below. This list draws from BMP and measurable goal recommendations that have been offered by EPA and others. The list has not been officially endorsed by EPA or state agencies; it is intended to serve as a starting point to help municipalities think about the BMPs and measurable goals that are appropriate to their IDDE programs. BMPs are listed in bold, followed by the measurable goals for each BMP. (The BMPs are organized according to the four elements required in an IDDE program.)

EPA allows MS4 operators a great deal of flexibility in determining what BMPs are most appropriate for their storm water programs.

■ STORM SEWER MAP

- ▶ **Create a storm sewer map**
 - Map a certain percentage of outfalls (adding up to 100% by the end of the permit term) or of the area of the town

■ ORDINANCE**➤ Pass an illicit discharge ordinance**

- Draft an IDDE ordinance (or storm water ordinance with IDDE component) or an amendment to existing bylaws
- Pass an ordinance or amendment

■ IDDE PLAN**➤ Prepare an IDDE plan**

- Complete a final plan and obtain the signature of the person overseeing the plan

➤ Conduct dry weather field screening of outfalls

- Screen a certain percentage of outfalls (adding up to 100% by the end of the permit term)

➤ Trace the source of potential illicit discharges

- Trace the source of a certain percentage of continuous flows (adding up to 100% by the end of the permit term)
- Trace the source of a certain percentage of intermittent flows and illegal dumping reports (100% may never be an achievable goal in this case)

➤ Eliminate illicit discharges

- Eliminate a certain number of discharges and/or a certain volume of flow, or a certain percentage of discharges whose source is identified (adding up to 100% by the end of the permit term)

■ OUTREACH**➤ Implement and publicize a household hazardous waste collection program**

- Hold a periodic (e.g., annual) hazardous waste collection day
- Mail flyers about the hazardous waste collection program to all town residences

➤ Create and distribute an informational flyer for homeowners about IDDE

- Mail the flyer to town residences
- Print the flyer as a doorknob hanger and have water-meter readers distribute it

➤ Create and distribute an informational flyer for businesses about IDDE

- Mail the flyer to targeted businesses

➤ Work with community groups to stencil storm drains

- Stencil a certain percentage of drains

► **Create and publicize an illicit discharge reporting hotline**

- Put the hotline in place
- Include an announcement of the hotline in sewer bills
- Follow up on all hotline reports within 48 hours

REFERENCES: CHAPTER 9

North Central Texas Council of Governments. 2002. *Storm Water Management in North Central Texas: Illicit Discharge Detection and Elimination*. http://www.dfwstormwater.com/Storm_Water_BMPs/illicit.html

USEPA. 1999. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. *Federal Register* Vol. 64 No. 235 (December 8, 1999), pp. 68722-68851. <http://www.epa.gov/npdes/regulations/phase2.pdf>

USEPA. 2000. *Storm Water Phase II Compliance Assistance Guide*. EPA 833-R-00-002. Office of Water. <http://www.epa.gov/npdes/pubs/comguide.pdf>

USEPA. 2000. EPA Storm Water Phase II Final Rule Fact Sheet 2.9: *Permitting and Reporting: The Process and Requirements*. EPA 833-F-011. January 2000. <http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>

USEPA. 2002. *National Menu of Best Management Practices for Storm Water Phase II*. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm>

USEPA. 2002. *Measurable Goals Guidance for Phase II Small MS4s*. <http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm>

This page is intentionally blank.

WEB SITES AND PUBLICATIONS

Key Information Available on EPA's Storm Water Web Site

Entry Point and General Information

<http://www.epa.gov/npdes>

➔ click on “Storm Water”

➔ click on “Municipal Separate Storm Sewer Systems” or “Phase II”

Storm Water Phase II Final Rule

<http://www.epa.gov/npdes/regulations/phase2.pdf>

IDDE section of the Phase II Final Rule: see section II(H)(3)(b)(iii), pp. 68756-68758.

EPA's Fact Sheet Series

<http://cfpub.epa.gov/npdes/stormwater/swfinal.cfm>

Overview

1.0 *Storm Water Phase II Final Rule: An Overview*

Small MS4 Program

2.0 *Small MS4 Storm Water Program Overview*

2.1 *Who's Covered? Designation and Waivers of Small Regulated MS4s*

2.2 *Urbanized Areas: Definition and Description*

Minimum Control Measures

2.3 *Public Education and Outreach*

2.4 *Public Participation/Involvement*

2.5 *Illicit Discharge Detection and Elimination*

2.6 *Construction Site Runoff Control*

2.7 *Post-Construction Runoff Control*

2.8 *Pollution Prevention/Good Housekeeping*

2.9 *Permitting and Reporting: The Process and Requirements*

2.10 *Federal and State-Operated MS4s: Program Implementation*

Construction Program

3.0 *Construction Program Overview*

3.1 *Construction Rainfall Erosivity Waiver*

Industrial “No Exposure”

4.0 *Conditional No Exposure Exclusion for Industrial Activity*

Documents

Storm Water Phase II Compliance Assistance Guide

<http://www.epa.gov/npdes/pubs/comguide.pdf>

National Menu of BMPs for Storm Water Phase II

<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm>

Measurable Goals Guidance for Phase II Small MS4s
<http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm>

Storm Water Web Sites

The Rouge River National Wet Weather Demonstration Project

<http://www.rougeriver.com>

(See specific information on IDDE at <http://www.rougeriver.com/techttop/illicit/overview.html> .)

Center for Watershed Protection's Storm Water Manager's Resource Center

<http://www.stormwatercenter.net>

The University of Tennessee's Municipal Technical Advisory Service NPDES Phase II Storm Water Management BMP Toolkit

<http://www.mtas.utk.edu/bmptoolkit.htm>

The Illicit Discharge section provides a number of useful web links and downloadable PDFs.

Organization Web Sites

Water Environment Federation

<http://www.wef.org>

American Public Works Association

<http://www.apwa.net>

Local Government Environmental Assistance Network

<http://www.lgean.org>

Center for Watershed Protection

<http://www.cwp.org>

The Boston Water and Sewer Commission

(the Web site includes the BWSC's regulations, outreach information, and other useful items)

<http://www.bwsc.org>

Storm Water Manuals

California Coastal Commission. 2002. *Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities*. <http://www.coastal.ca.gov/la/murp.html>

Colorado Department of Public Health and Environment, Water Quality Control Division. October 2001. *Colorado's Phase II Municipal Guidance: A guide to application requirements and program development for coverage under Colorado's Phase II municipal stormwater discharge permit*.

<http://www.cdph.state.co.us/wq/PermitsUnit/wqcdpmt.html>

IDDE Manuals

San Diego Stormwater Copermittees Jurisdictional Urban Runoff Management Program. 2001. *Illicit Connection/Illicit Discharge (IC/ID) Detection and Elimination Model Program Guidance*.

http://www.projectcleanwater.org/html/model_programs.html

Pitt, R., M. Lalor, R. Field, D.D. Adrian, and D. Barbe. 1993. *Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems: A User's Guide*. USEPA Office of Research and Development. EPA/600/R-92/238. (Available on the Web via EPA's National Environmental Publications Information System, <http://www.epa.gov/clariton>.)

North Central Texas Council of Governments. 2002. *Storm Water Management in North Central Texas: Illicit Discharge Detection and Elimination*. http://www.dfwstormwater.com/Storm_Water_BMPs/illicit.html

Information on Specific Topics

Ordinances

USEPA's *Model Ordinances to Protect Local Resources: Illicit Discharges*. <http://www.epa.gov/owow/nps/ordinance/discharges.htm>

(The same information can be found at <http://www.stormwatercenter.net>.)

Boston Water and Sewer Commission's *Regulations Governing the Use of Sanitary and Combined Sewers and Storm Drains*. <http://www.bwsc.org>

The Massachusetts Citizen Planner Training Collaborative offers "Tips on Drafting Bylaws" for Massachusetts municipalities: http://www.umass.edu/masscptc/Tips_on_Drafting.html

Optical Brighteners

Sargent, D. and W. Castonguay. 1998. *An Optical Brightener Handbook*. Available at: http://www.mvpc.org/services_sec/mass_bays/optical_handbook.htm and <http://www.naturecompass.org/8tb/sampling/>

Dye Testing

Dye supplier used by a reviewer of this manual: NORLAB, Inc., Amherst, OH. 1-800-247-9422; <http://www.norlabdyes.com>

Smoke Testing

Smoke testing equipment supplier used by a reviewer of this manual: Hurco Technologies, Inc., 1-800-888-1436; <http://www.hurcotech.com>

Outfall/Manhole Surveys

Massachusetts Division of Fisheries, Wildlife, and Environmental Law Enforcement. Storm Drain Mapping Project Field Manual (Draft). January 2002. <http://www.state.ma.us/dfwele/River/pdf/rivstormdrainmanual.pdf>

Jewell, C. 2001. A Systematic Methodology for Identification and Remediation of Illegal Connections. Presented at the Water Environment Federation Specialty Conference 2001 *A Collection Systems Odyssey: Combining Wet Weather and O&M Solutions*. (Available for purchase via the WEF Web site, <http://www.wef.org>.)

Outreach

- **Household Hazardous Waste Collection**

Household hazardous waste collection days in New Hampshire can be viewed online at <http://www.des.state.nh.us/hhw/hhwevent.htm>.

Environmental Depot, Burlington VT. http://www.cswd.net/facilities/hazardous_waste.shtml

- **Storm-Drain Stenciling**

Earthwater Stencils, an organization that does storm drain stenciling: <http://www.earthwater-stencils.com/>

The Ocean Conservancy's Storm Drain Sentries program has a goal of having volunteers stencil one million storm drains with educational pollution prevention messages. The Ocean Conservancy supplies volunteers with a fact sheet about nonpoint source pollution, tips on conducting a stenciling project, and stencils for volunteer organizations to use. In return, stenciling project leaders are asked to submit data about the number of storm drains they stenciled, the types of pollutants found near the storm drains, and potential pollutant sources. This information is added to a growing database maintained by the Ocean Conservancy. Contact the Ocean Conservancy's Office of Pollution Prevention and Monitoring at 757-496-0920 or stormdrain@oceanconservancyva.org.

<http://www.oceanconservancy.org/dynamic/getInvolved/events/sentries/sentries.htm>

Resources for storm drain stenciling programs in New Hampshire:

- Coordinated by Julia Peterson of UNH-Cooperative Extension in the coastal watershed <http://ceinfo.unh.edu/Common/Documents/gsc5401.htm>. Also described at <http://www.seagrant.unh.edu/extension.htm>
- Coordinated by the NH Coastal Program (part of the Office of State Planning) <http://www.state.nh.us/coastal/CoastalEducation/marinedebris.htm>
- Description of Manchester's storm drain stenciling on EPA's Web site describing the SEPP <http://www.epa.gov/region1/eco/csoman/sepp.html> (See #1 and #6)

- **Outreach Materials**

EPA is preparing educational materials on different water topics each month as part of the year-long celebration of the 30th anniversary of the Clean Water Act. April 2003 will be Storm Water Month. The public education kit is expected to include:

- General Storm Water Awareness brochure
- Homeowner Guide (car washing, vehicle fluids changing, lawn & garden care, pet waste, septic system management)
- Small Construction Guide poster
- Press release
- Public service announcement for the radio
- Stickers
- Door hanger with illicit discharge message
- PowerPoint presentation

These items will be available for download or order on EPA's Year of Clean Water Web site, <http://www.epa.gov/water/yearofcleanwater/month.html>. Before the materials are available on the Web site, you can contact EPA's contractor, TetraTech, to be on the mailing list for the materials.

Email Kathryn Phillips at ttratech1@earthlink.net or kathryn.phillips@ttratech-ffx.com.

CONTACTS

USEPA-New England is the NPDES permitting authority for Massachusetts and New Hampshire. The other five NEIWPC member states serve as NPDES permitting authorities for the storm water program. Contact information below was taken from the EPA-New England Web site

<http://www.epa.gov/region01/npdes/stormwater/administration.html>, the EPA NPDES Web site <http://www.epa.gov/npdes>, and the New York State Department of Environmental Conservation Web site <http://www.dec.state.ny.us>.

U.S. EPA

EPA Region 1, New England

Regional Storm Water Coordinator

Thelma Murphy 617-918-1615; murphy.thelma@epa.gov

Regional Storm Water Assistance Team

Ann Herrick 617-918-1560; herrick.ann@epa.gov

Shelly Puleo 617-918-1545; puleo.shelly@epa.gov

Olga Vergara 617-918-1519, vergara.olga@epa.gov

Massachusetts Assistance

Dave Gray 617-918-1577; gray.davidj@epa.gov

EPA Region 2

Regional Storm Water Coordinator

Karen O'Brien 212-637-3717; obrien.karen@epa.gov

STATES

Connecticut

Connecticut Department of Environmental Protection

Bureau of Water Management

Permitting, Enforcement, and Remediation Division

<http://www.dep.state.ct.us>

Contact: Chris Stone 860-424-3850; chris.stone@po.state.ct.us

Maine

Maine Department of Environmental Protection

Bureau of Land and Water Quality

<http://www.state.me.us/dep/blwq/stormwtr/index.htm>

Contact: David Ladd 207-287-5404; david.ladd@state.me.us

Massachusetts

Massachusetts Department of Environmental Protection

Division of Watershed Management

<http://www.state.ma.us/dep/brp/stormwtr/stormhom.htm>

Contacts: Ginny Scarlet 508-767-2797; ginny.scarlet@state.ma.us

Linda Domizio 508-849-4005; linda.domizio@state.ma.us

New Hampshire

New Hampshire Department of Environmental Services

Storm Water Fact Sheet: <http://www.des.state.nh.us/factsheets/wwt/web-8.htm>

Storm Water Web Site: <http://www.des.state.nh.us/StormWater>

Contacts: Jeff Andrews 603-271-2984

Public Information and Permitting Office 603-271-2975

New York

New York State Department of Environmental Conservation

Division of Water

<http://www.dec.state.ny.us/website/dow/mainpage.htm>

Contact: Mike Rafferty 518-402-8094; mrraffer@gw.dec.state.ny.us

Rhode Island

Rhode Island Department of Environmental Management

Water Resources – Permitting

<http://www.state.ri.us/dem/programs/benviron/water/permits/ripdes/stwater/index.htm>

Contacts: Margarita Chatterton 401-222-4700 x7605; mchatter@dem.state.ri.us

Greg Goblick 401-222-4700 x7265; ggoblick@dem.state.ri.us

Vermont

Vermont Department of Environmental Conservation

Water Quality Division

<http://www.anr.state.vt.us/dec/waterq/stormwater.htm>

Contact: Peter LaFlamme 802-241-3765; petel@dec.anr.state.vt.us

APPENDIX A

Model Illicit Discharge and Connection Stormwater Ordinance¹

ORDINANCE NO. _____

SECTION 1. PURPOSE/INTENT.

The purpose of this ordinance is to provide for the health, safety, and general welfare of the citizens of (_____) through the regulation of non-storm water discharges to the storm drainage system to the maximum extent practicable as required by federal and state law. This ordinance establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system (MS4) in order to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process. The objectives of this ordinance are:

- 1) To regulate the contribution of pollutants to the municipal separate storm sewer system (MS4) by stormwater discharges by any user
- (2) To prohibit Illicit Connections and Discharges to the municipal separate storm sewer system
- (3) To establish legal authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure compliance with this ordinance

SECTION 2. DEFINITIONS.

For the purposes of this ordinance, the following shall mean:

Authorized Enforcement Agency: employees or designees of the director of the municipal agency designated to enforce this ordinance.

Best Management Practices (BMPs): schedules of activities, prohibitions of practices, general good house keeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

Clean Water Act. The federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

Construction Activity. Activities subject to NPDES Construction Permits. Currently these include construction projects resulting in land disturbance of 5 acres or more. Beginning in March 2003, NPDES Storm Water Phase II permits will be required for construction projects resulting in land disturbance of 1 acre or more. Such activities include but are not limited to clearing and grubbing, grading, excavating, and demolition.

Hazardous Materials. Any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Illegal Discharge. Any direct or indirect non-storm water discharge to the storm drain system, except as exempted in Section X of this ordinance.

Illicit Connections. An illicit connection is defined as either of the following:

¹ USEPA. 2002. *Model Ordinances to Protect Local Resources: Illicit Discharges*. <http://www.epa.gov/owow/nps/ordinance/discharges.htm>

Any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge to enter the storm drain system including but not limited to any conveyances which allow any non-storm water 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 said 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 which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.

Industrial Activity. Activities subject to NPDES Industrial Permits as defined in 40 CFR, Section 122.26 (b)(14). National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit. means a permit issued by EPA (or by a State under authority delegated pursuant to 33 USC § 1342(b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

Non-Storm Water Discharge. Any discharge to the storm drain system that is not composed entirely of storm water. Person. means any individual, association, organization, partnership, firm, corporation or other entity recognized by law and acting as either the owner or as the owner's agent.

Pollutant. Anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordinances, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

Premises. Any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.

Storm Drainage System. Publicly-owned facilities by which storm water is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.

Storm Water. Any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.

Stormwater Pollution Prevention Plan. A document which describes the Best Management Practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site and the actions to eliminate or reduce pollutant discharges to Stormwater, Stormwater Conveyance Systems, and/or Receiving Waters to the Maximum Extent Practicable.

Wastewater means any water or other liquid, other than uncontaminated storm water, discharged from a facility.

SECTION 3. APPLICABILITY.

This ordinance shall apply to all water entering the storm drain system generated on any developed and undeveloped lands unless explicitly exempted by an authorized enforcement agency.

SECTION 4. RESPONSIBILITY FOR ADMINISTRATION.

The _____ [authorized enforcement agency] shall administer, implement, and enforce the provisions of this ordinance. Any powers granted or duties imposed upon the authorized enforcement agency may be delegated in writing by the Director of the authorized enforcement agency to persons or entities acting in the beneficial interest of or in the employ of the agency.

SECTION 5. SEVERABILITY.

The provisions of this ordinance are hereby declared to be severable. If any provision, clause, sentence, or paragraph of this Ordinance or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or application of this Ordinance.

SECTION 6. ULTIMATE RESPONSIBILITY.

The standards set forth herein and promulgated pursuant to this ordinance are minimum standards; therefore this ordinance does not intend nor imply that compliance by any person will ensure that there will be no contamination, pollution, nor unauthorized discharge of pollutants.

SECTION 7. DISCHARGE PROHIBITIONS.Prohibition of Illegal Discharges.

No person shall discharge or cause to be discharged into the municipal storm drain system or watercourses any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water.

The commencement, conduct or continuance of any illegal discharge to the storm drain system is prohibited except as described as follows:

- (1) The following discharges are exempt from discharge prohibitions established by this ordinance: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wetland flows, swimming pools (if dechlorinated - typically less than one PPM chlorine), fire fighting activities, and any other water source not containing Pollutants.
- (2) Discharges specified in writing by the authorized enforcement agency as being necessary to protect public health and safety.
- (3) Dye testing is an allowable discharge, but requires a verbal notification to the authorized enforcement agency prior to the time of the test.
- (4) The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

Prohibition of Illicit Connections.

- (1) The construction, use, maintenance or continued existence of illicit connections to the storm drain system is prohibited.
- (2) This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.
- (3) A person is considered to be in violation of this ordinance if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.

SECTION 8. SUSPENSION OF MS4 ACCESS.Suspension due to Illicit Discharges in Emergency Situations

The _____ [authorized enforcement agency] may, without prior notice, suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the MS4 or Waters of the United States. If the violator fails to comply with a suspension order issued in an emergency, the authorized enforcement agency may take such steps as deemed necessary to prevent or minimize damage to the MS4 or Waters of the United States, or to minimize danger to persons.

Suspension due to the Detection of Illicit Discharge

Any person discharging to the MS4 in violation of this ordinance may have their MS4 access terminated if such

termination would abate or reduce an illicit discharge. The authorized enforcement agency will notify a violator of the proposed termination of its MS4 access. The violator may petition the authorized enforcement agency for a reconsideration and hearing.

A person commits an offense if the person reinstates MS4 access to premises terminated pursuant to this Section, without the prior approval of the authorized enforcement agency.

SECTION 9. INDUSTRIAL OR CONSTRUCTION ACTIVITY DISCHARGES.

Any person subject to an industrial or construction activity NPDES storm water discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the _____ [authorized enforcement agency] prior to the allowing of discharges to the MS4.

SECTION 10. MONITORING OF DISCHARGES.

1. Applicability.

This section applies to all facilities that have storm water discharges associated with industrial activity, including construction activity.

2. Access to Facilities.

- (1) The _____ [authorized enforcement agency] shall be permitted to enter and inspect facilities subject to regulation under this ordinance as often as may be necessary to determine compliance with this ordinance. If a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to representatives of the authorized enforcement agency.
- (3) Facility operators shall allow the _____ [authorized enforcement agency] ready access to all parts of the premises for the purposes of inspection, sampling, examination and copying of records that must be kept under the conditions of an NPDES permit to discharge storm water, and the performance of any additional duties as defined by state and federal law.
- (3) The _____ [authorized enforcement agency] shall have the right to set up on any permitted facility such devices as are necessary in the opinion of the authorized enforcement agency to conduct monitoring and/or sampling of the facility's storm water discharge.
- (4) The _____ [authorized enforcement agency] has the right to require the discharger to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense. All devices used to measure stormwater flow and quality shall be calibrated to ensure their accuracy.
- (5) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the operator at the written or oral request of the [authorized enforcement agency] and shall not be replaced. The costs of clearing such access shall be borne by the operator.
- (6) Unreasonable delays in allowing the _____ [authorized enforcement agency] access to a permitted facility is a violation of a storm water discharge permit and of this ordinance. A person who is the operator of a facility with a NPDES permit to discharge storm water associated with industrial activity commits an offense if the person denies the authorized enforcement agency reasonable access to the permitted facility for the purpose of conducting any activity authorized or required by this ordinance.

- (7) If the _____ [authorized enforcement agency] has been refused access to any part of the premises from which stormwater is discharged, and he/she is able to demonstrate probable cause to believe that there may be a violation of this ordinance, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this ordinance or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the authorized enforcement agency may seek issuance of a search warrant from any court of competent jurisdiction.

SECTION 11. REQUIREMENT TO PREVENT, CONTROL, AND REDUCE STORM WATER POLLUTANTS BY THE USE OF BEST MANAGEMENT PRACTICES.

[Authorized enforcement agency] will adopt requirements identifying Best Management Practices for any activity, operation, or facility which may cause or contribute to pollution or contamination of storm water, the storm drain system, or waters of the U.S. The owner or operator of a commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the municipal storm drain system or watercourses through the use of these structural and non-structural BMPs. Further, any person responsible for a property or premise, which is, or may be, the source of an illicit discharge, may be required to implement, at said person's expense, additional structural and non-structural BMPs to prevent the further discharge of pollutants to the municipal separate storm sewer system. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of storm water associated with industrial activity, to the extent practicable, shall be deemed compliance with the provisions of this section. These BMPs shall be part of a stormwater pollution prevention plan (SWPP) as necessary for compliance with requirements of the NPDES permit.

SECTION 12. WATERCOURSE PROTECTION.

Every person owning property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse. In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

SECTION 13. NOTIFICATION OF SPILLS.

Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials which are resulting or may result in illegal discharges or pollutants discharging into storm water, the storm drain system, or water of the U.S. said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, said person shall notify the authorized enforcement agency in person or by phone or facsimile no later than the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the _____ [authorized enforcement agency] within three business days of the phone notice. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

SECTION 14. ENFORCEMENT.

1. Notice of Violation.

Whenever the _____ [authorized enforcement agency] finds that a

person has violated a prohibition or failed to meet a requirement of this Ordinance, the authorized enforcement agency may order compliance by written notice of violation to the responsible person. Such notice may require without limitation:

- (a) The performance of monitoring, analyses, and reporting;
- (b) The elimination of illicit connections or discharges;
- (c) That violating discharges, practices, or operations shall cease and desist;
- (d) The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property; and
- (e) Payment of a fine to cover administrative and remediation costs; and
- (f) The implementation of source control or treatment BMPs.

If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

SECTION 15. APPEAL OF NOTICE OF VIOLATION.

Any person receiving a Notice of Violation may appeal the determination of the authorized enforcement agency. The notice of appeal must be received within __ days from the date of the Notice of Violation. Hearing on the appeal before the appropriate authority or his/her designee shall take place within 15 days from the date of receipt of the notice of appeal. The decision of the municipal authority or their designee shall be final.

SECTION 16. ENFORCEMENT MEASURES AFTER APPEAL.

If the violation has not been corrected pursuant to the requirements set forth in the Notice of Violation, or , in the event of an appeal, within __ days of the decision of the municipal authority upholding the decision of the authorized enforcement agency, then representatives of the authorized enforcement agency shall enter upon the subject private property and are authorized to take any and all measures necessary to abate the violation and/or restore the property. It shall be unlawful for any person, owner, agent or person in possession of any premises to refuse to allow the government agency or designated contractor to enter upon the premises for the purposes set forth above.

SECTION 17. COST OF ABATEMENT OF THE VIOLATION.

Within __ days after abatement of the violation, the owner of the property will be notified of the cost of abatement, including administrative costs. The property owner may file a written protest objecting to the amount of the assessment within __ days. If the amount due is not paid within a timely manner as determined by the decision of the municipal authority or by the expiration of the time in which to file an appeal, the charges shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment. Any person violating any of the provisions of this article shall become liable to the city by reason of such violation. The liability shall be paid in not more than 12 equal payments. Interest at the rate of __ percent per annum shall be assessed on the balance beginning on the __st day following discovery of the violation.

SECTION 18. INJUNCTIVE RELIEF.

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this Ordinance. If a person has violated or continues to violate the provisions of this ordinance, the authorized enforcement agency may petition for a preliminary or permanent injunction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation.

SECTION 19. COMPENSATORY ACTION.

In lieu of enforcement proceedings, penalties, and remedies authorized by this Ordinance, the authorized enforcement agency may impose upon a violator alternative compensatory actions, such as storm drain stenciling, attendance at compliance workshops, creek cleanup, etc.

SECTION 20. VIOLATIONS DEEMED A PUBLIC NUISANCE.

In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this Ordinance is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.

SECTION 21. CRIMINAL PROSECUTION.

Any person that has violated or continues to violate this ordinance shall be liable to criminal prosecution to the fullest extent of the law, and shall be subject to a criminal penalty of _____ dollars per violation per day and/or imprisonment for a period of time not to exceed ____ days.

The authorized enforcement agency may recover all attorney's fees court costs and other expenses associated with enforcement of this ordinance, including sampling and monitoring expenses.

SECTION 22. REMEDIES NOT EXCLUSIVE.

The remedies listed in this ordinance are not exclusive of any other remedies available under any applicable federal, state or local law and it is within the discretion of the authorized enforcement agency to seek cumulative remedies.

SECTION 23. ADOPTION OF ORDINANCE.

This ordinance shall be in full force and effect __ days after its final passage and adoption. All prior ordinances and parts of ordinances in conflict with this ordinance are hereby repealed.

PASSED AND ADOPTED this ____ day of _____, 19__, by the following vote:

APPENDIX I

IDDE Employee Training Record



ENVIRONMENTAL
 **PARTNERS**
— An Apex Company —

1900 Crown Colony Drive, Suite 402
Quincy, MA 02169
P: 617.657.0200 F: 617.657.0201

envpartners.com