

Volume

1

GUIDELINES AND
STANDARD OPERATING PROCEDURES

For Stormwater Phase II Communities in Maine

**Information for
Program Managers**

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1. INTRODUCTION

This section describes the regulatory basis, intended audience, and overall organization of this manual.

1.1 BASIS FOR THE MANUAL

In June 2003, the Maine Department of Environmental Protection (MDEP) issued a General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4s). Twenty-eight communities became subject to Stormwater Phase II regulations based on their designation as Urbanized Areas according to the 2000 US Census. The regulation specifies issuance of a General Permit every five years. The current General Permit, which is valid from June 2003 through June 2008, requires that each regulated community develop a five-year plan to:

“(R)educe the discharge of pollutants from its regulated small MS4 to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act.”

Fourteen of the regulated communities in the Casco Bay watershed, with assistance from the Casco Bay Estuary Partnership (CBEP), Cumberland County Soil and Water Conservation District (CCSWCD), and others, formed an Interlocal Stormwater Working Group (ISWG) to collaborate on selected requirements of the General Permit. In particular, the ISWG identified the need for a locally-adaptable set of guidelines and standard operating procedures (SOPs) as a top priority to improve the quality of municipal stormwater practices. Six additional communities in southern Maine and central Maine joined with the ISWG to create this manual.

Stormwater accumulates sediments, pathogens, nutrients, toxic chemicals, and other pollutants as it runs off into storm drain systems and out into receiving water bodies, and is possibly the single greatest contributor of contaminants to Casco Bay (CBEP 1995). This non-point source of pollution directly contributes to degraded water quality throughout Maine, and can result in the closure of clam flats and swimming areas as well as degraded habitats within Casco Bay and other coastal areas. CBEP’s 1995 *Casco Bay Plan* prioritizes the need to minimize the loading of pathogens, toxics, nutrients, and sediments from stormwater and combined sewer overflows to Casco Bay, as well as the need to reduce loading from non-point sources of pollution.

**KEY AREAS
ADDRESSED BY
THIS MANUAL**

- Illicit Discharge
Detection and
Elimination

- Pollution Prevention
and Good
Housekeeping for
Municipal
Operations

This manual seeks to advance these goals in order to improve water quality throughout the Casco Bay watershed and the other watersheds in Maine, and is intended to provide local support to municipal staff in stormwater management efforts, guiding the employees who serve as the front-line in the implementation of the General Permit requirements.

1.2 OBJECTIVES OF THE MANUAL

The specific objectives of the manual are to:

- ◆ Provide a commonly-accepted set of technical standards and guidance on stormwater management measures that will control the quantity and quality of stormwater produced by municipal activities, new development and redevelopment;
- ◆ Assist municipalities in meeting Stormwater Phase II requirements;
- ◆ Encourage the use of targeted best management practices (BMPs) with the long-term goal of consistent application by all regulated entities within the watershed;
- ◆ Encourage cost-savings for MS4s through proper and timely maintenance of stormwater systems; and
- ◆ Promote behavior that will improve water quality in the Casco Bay watershed and other watersheds in Maine.

1.3 CONTENT OF THE MANUAL

The content of the manual is based primarily on selected requirements of the Stormwater Phase II program. Each community's five-year plan must address the following six minimum control measures:

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

This SOP manual addresses components for two of the minimum control measures, Illicit Discharge Detection and Elimination and Pollution Prevention/Good Housekeeping, as follows (text in italics is taken directly from the General Permit):

3. Illicit Discharge Detection and Elimination – This manual describes the procedures that should be taken to develop an IDDE program for a small MS4. Development of an IDDE program should be based on the specific needs of each municipality and the watersheds it falls within. Each community will develop its own unique IDDE program. Program Managers should complete the following steps to develop an effective IDDE program: *1. locate priority areas likely to have illicit discharges, 2. map the storm drain system, 3. develop an illicit discharge detection program, 4. develop procedures to trace the source of an illicit discharge, 5. develop procedures to remove a source, and 6. evaluate the IDDE program effectiveness.* This SOP manual provides guidance on how to complete each of these six steps, resulting in an effective IDDE program that fulfills the intent of the General Permit.

6. Pollution Prevention/Good Housekeeping for Municipal Operations –The General Permit requires inclusion of certain Pollution Prevention/Good Housekeeping components as part of the five-year plan, and suggests others. The required components addressed by this manual include development of:
 - a) *An operation and maintenance program that includes a training component for municipal employees and contractors and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. . .this program must include employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction, land disturbances, and stormwater system maintenance;*
 - b) *A program to sweep all publicly accepted paved streets and publicly owned paved parking lots at least once a year as soon as possible after snowmelt;*
 - c) *A program to evaluate and if necessary, clean catch basins and other stormwater structures that accumulate sediment at least once a year and dispose of the removed sediments in accordance with current state law; and*
 - d) *A program to evaluate and if necessary prioritize for repairing, retrofitting, or upgrading the conveyance, structures, and outfalls of the regulated small MS4.*

This manual also addresses development of *procedures for properly disposing of waste removed from the separate storm sewers*, which is a suggested component of the Pollution Prevention/Good Housekeeping minimum control measure. Just as for the IDDE Minimum Control Measure (MCM), the General Permit does not specify what the procedures should include. Therefore, each municipality will be developing its own unique program according to community needs and available resources.

1.4 MANUAL AUDIENCE AND ORGANIZATION

The Stormwater Phase II Program requires the development of new programs and training for municipal employees to implement new programs during daily activities. For this reason the manual addresses two distinct audiences: (1) Program Managers, who will direct the development of new programs, and (2) municipal employees, such as public works personnel, who will implement the programs on a day-to-day basis.

Volume 1 is intended for use by individuals who are responsible for overseeing and implementing the Stormwater Phase II Program (the “Program Manager”). For the purposes of this manual, the Program Manager is typically in a supervisory or managerial position and in a position to train other employees in procedures required by the Stormwater Phase II Program. Chapter 1 provides an introduction and overview of the manual. Chapter 2, *Illicit Discharge Detection and Elimination*, presents procedures for Program Managers to use in identifying high priority areas, tracing illicit discharges, and eliminating illicit discharges. Chapter 3, *Pollution Prevention and Good Housekeeping*, provides general discussions of the many ways that municipal activities such as vehicle and facilities maintenance may adversely affect stormwater, and reviews ways to modify municipal operations to better prevent and reduce stormwater pollution. Chapter 3 guides the Program Manager through decisions they will need to make in developing procedures related to good housekeeping and pollution prevention. Note: Tables, figures, and forms cited within the text are provided at the end of the volume.

Volume 2 is intended for use by “hands-on” municipal employees. Chapter 1 provides an introduction and overview of the manual. Chapter 2 contains Standard Operating Procedures (SOPs) and forms for use in the performance Illicit Discharge Detection and Elimination. Chapter 3 contains SOPs for use during regular work duties. The SOPs, which are designed to be concise and easy to use, are divided into three categories: *Always*, *Whenever Possible*, and *Never*. The SOPs include forms and summary sheets for use during illicit discharge tracing and elimination and routine work activities. Specific training on the SOPs will help to reinforce their importance and encourage implementation.

1.5 COMMON STORMWATER POLLUTANTS, SOURCES, AND IMPACTS

Stormwater runoff contains pollutants that can harm human health, degrade water quality and aquatic habitat, and impair ecosystem functions. On its way to streams, estuaries, and other receiving water bodies, stormwater runoff accumulates pollutants such as oil, gas, and other hydrocarbons, heavy metals, deicers, pesticides, fine sediment, fertilizers, and bacteria, all of which can impair water quality. The pollutants of greatest concern in Casco Bay are nitrogen, toxic contaminants such as polycyclic aromatic hydrocarbons (PAHs), and fecal coliform bacteria. Runoff from fertilized lawns contributes excess nutrients to water bodies, which can lead to algal blooms and in extreme cases, fish kill events due to low dissolved oxygen levels. Elevated fecal coliform levels impair water

quality and can lead to restrictions on the use and enjoyment of natural resources such as shellfish beds and swimming areas. Other stormwater pollutants of concern are toxic contaminants, such as heavy metals and pesticides, which originate from vehicles and businesses or from homeowner activities.

All of these pollutants can wash into receiving waterbodies during storm events. Understanding the sources of these pollutants and the impacts each pollutant has can help inform municipal planning and assist in identifying priority goals and objectives when managing stormwater. The following table summarizes common stormwater pollutants, their sources and potential impacts.

Table 1-1: Common Stormwater Pollutants, Sources, and Impacts.

| Pollutant | Sources | Impacts |
|---|--|---|
| Sediment | Construction sites; eroding streambanks and lakeshores; winter sand and salt application; vehicle/boat washing; agricultural sites. | Destruction of plant and fish habitat; transportation of attached oils, nutrients and other pollutants; increased maintenance costs. |
| Nutrients (phosphorus, nitrogen) | Fertilizers; malfunctioning septic systems; livestock, bird & pet waste; vehicle/boat washing; grey water; decaying grass and leaves; sewer overflows; leaking trash containers. | Increased potential for nuisance or toxic algal blooms; increased potential for hypoxia/anoxia (low levels of dissolved oxygen which can kill aquatic organisms). |
| Hydrocarbons (Polycyclic Aromatic Hydrocarbons) | Vehicle and equipment leaks; vehicle and equipment emissions; pesticides; fuel spills; equipment cleaning; improper fuel storage & disposal. | Toxic at low levels. |
| Heavy Metals | Vehicle brake and tire wear; vehicle/equipment exhaust; batteries; galvanized metal; paint and wood preservatives; batteries; fuels; pesticides; cleaners. | Toxic at low levels; drinking water contamination. |
| Pathogens | Livestock, bird and pet wastes; malfunctioning septic systems; sewer overflows. | Risk to human health leading to closure of shellfish areas and swimming areas; drinking water contamination. |
| Toxic Chemicals | Heavy metals; PAHs; pesticides; dioxins; PCBs; from wear, spills, illegal discharges and leaks. | Toxic at low levels. |
| Debris/Litter | Improper waste disposal and storage; fishing gear; leaking rubbish containers; cigarette butts; littering. | Potential risk to human and aquatic life. |

2. ILLICIT DISCHARGE DETECTION AND ELIMINATION

Maine DEP defines an **illicit discharge** as any discharge to an MS4 that is not composed entirely of stormwater or the allowable non-stormwater discharges such as water from fire fighting activities, infiltrating groundwater, etc.

In most communities, the municipal separate storm drain systems discharge to receiving waterbodies without treatment. Therefore, it is particularly important that only stormwater is discharged and to ensure that illicit discharges are eliminated from the system. The General Permit requires that an IDDE program be developed by the regulated municipalities. While most municipalities have programs in place to inspect and address combined sewers or sanitary sewers, few municipalities have procedures in place related to an IDDE program. Several excellent IDDE guidance manuals were reviewed and used in developing this chapter. In particular, the Center for Watershed Protection (CWP) produced a series of manuals published related to Illicit Discharge Detection and Elimination. This manual regularly draws from the Center's 2004 publication, *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*. The New England Interstate Water Pollution Control Commission (NEIWPC) also published a concise handbook on IDDE for municipalities in 2003.

Chapter 2 provides managers with the procedures necessary to create an effective IDDE program in accordance with the Maine General Permit. The General Permit requires each MS4 to develop, implement and enforce a program to detect and eliminate illicit discharges, but only provides a certain level of detail on specific requirements for an IDDE program. Therefore this chapter will assist Program Managers with making key decisions in developing an IDDE program that is effective for their municipality. Program Managers should first have a good understanding of the types of illicit discharges that may be encountered. Section 2.1 provides a description of various types of illicit discharges that may be present in a community. The next sections address additional steps to creating an effective IDDE program: locating priority areas within a community (Section 2.2), creating a map of the storm drain system (Section 2.3), developing an illicit discharge detection program (Section 2.4), tracing the illicit discharge back to its source (Section 2.5), removing the illicit discharge (Section 2.6), and tracking illicit discharges (Section 2.7). Lastly, Section 2.8 provides an approach to evaluating the overall IDDE program.

2.1 TYPES AND SOURCES OF ILLICIT DISCHARGES

MDEP defines an illicit discharge as *any non-permitted discharge to a regulated small MS4 or to the waters of the State that does not consist entirely of stormwater or allowable non-stormwater discharges*. Allowable non-stormwater discharges are listed in Part IV(D)(3)(b) of the General Permit. It is important to understand the types of illicit discharges that may occur to know what to look for, and to consider discharge frequency and land use in the IDDE process. Illicit discharges are often categorized according to frequency, which provides a clue about the source and helps determine which tracing techniques may be useful in locating the discharge. The Center for Watershed Protection classifies illicit discharge frequency into three categories:

1. Transitory illicit discharges are typically one-time events resulting from spills, breaks, dumping, or accidents. Transitory illicit discharges are often reported to an authority through a citizen complaint line or following observation by a municipal employee during regular duties. Because they are not recurring, they are the most difficult to investigate, trace, and remove. The best method to reduce transitory discharges is through general public education, education of municipal response personnel, tracking of discharge locations, and enforcement of an illicit discharge ordinance.
2. Intermittent illicit discharges occur occasionally over a period of time (several hours per day, or a few days per year). Intermittent discharges can result from legal connections to the storm drain system, such as a legal sump pump connection that is illegally discharging washing machine water or a single home sanitary connection, or from illegal connections. Intermittent discharges can also result from activities such as excessive irrigation or wash down water from exterior areas. These types of discharges are more likely to be discovered, and are less difficult to trace and remove, but can still present significant challenges. These discharges can have large or small impacts on waterbodies depending on pollutant content.
3. Continuous illicit discharges are typically the result of a direct connection from a sanitary sewer, overflow from a malfunctioning septic system, or inflow from a nearby subsurface sanitary sewer that is malfunctioning. Continuous illicit discharges are usually easiest to trace and can have the greatest pollutant load.(CWP 2004)

It is also important to consider land use when looking for illicit discharges. Table 2-1 (see p. T-2-1) provides a list of conditions and activities that may produce transitory and intermittent discharges, along with associated sources and land use. Table 2-2 (p. T-2-2) lists possible sources of continuous discharges and their associated land use.

Once a Program Manager understands the types of illicit discharges that might be present in his/her community, the manager can begin to review existing information that will identify where illicit discharges are likely to be found. An effective detection and elimination program will address all types of illicit discharges.

2.2 LOCATING PRIORITY AREAS

Section 2.2 provides a methodology for locating priority areas that have a high potential for illicit discharges. Most municipalities will conduct this process once during the 2003-2008 permit cycle, and then evaluate and revise the process for each subsequent permit cycle as illicit discharges are removed (described in Section 2.6). The material provided in this section was taken from the CWP manuals (CWP 2004) and the NEIWPCC manual (NEIWPCC 2003). These manuals provide more detail on the process.

To locate priority areas within a community, the Program Manager should:

1. Become familiar with the community’s waterbodies, its watersheds, local water quality classifications, and current water quality in order to divide the community into discrete areas that can be prioritized;
2. Gather and evaluate available information that will provide clues as to where in the community illicit discharges might be found; and
3. Use the existing information to assess where illicit discharges may be found and what waterbodies need to be protected from illicit discharges.

The following subsections present further discussion of each of these areas. Although a Program Manager should take the time to prioritize watersheds prior to completing any mapping, some communities may complete their mapping first, then use the results of mapping to produce a more refined evaluation.

| | | |
|--|--------------|---------------|
| US Geological Survey (USGS) and Natural Resource Conservation Service (NRCS) Watershed Numbering System | | |
| | | HUC |
| <u>Level</u> | <u>Name</u> | <u>Number</u> |
| 1 | Region | 2 digit |
| 2 | Sub-region | 4 digit |
| 3 | Basin | 6 digit |
| 4 | Sub-basin | 8 digit |
| 5 | Watershed | 10 digit |
| 6 | Subwatershed | 12 digit |
| 7 | Drainage | 14 digit |
| 8 | Site | 16 digit |

2.2.1 Identify Watersheds and Water Bodies

In order to identify priority areas where illicit discharges may occur, a decision must be made as to how to define an “area”. The Center for Watershed Protection recommends defining watersheds for individual waterbodies. The Maine Office of Geographic Information Systems website offers coverage files that show Level 6 subwatershed boundaries (which have 12 digit Hydrologic Unit Codes [HUCs]) and Level 7 drainage boundaries (which have 14 digit HUCs). Within Maine, Level 6 subwatersheds range in size from 10,000 to 200,000 acres of land (15 to 300 square miles). Level 7 drainage areas range in size from 3,000 to 10,000 acres of land (5 to 15 square miles). Figure 2-1 shows Maine’s Level 6 subwatersheds. Figures 2-2 through 2-5 show large scale Level 6 subwatershed information for the four central areas where the Stormwater Phase II regulations are in effect. For some communities, Level 6 subwatersheds provide small enough areas to use for evaluation and prioritizing.

However, using the smaller Level 7 subwatersheds would provide a more focused prioritization.

2.2.2 Review Available Information

Priority areas for IDDE will vary from one community to another depending on water quality conditions, land use, etc. A relatively simple desktop assessment of available community information can provide many clues as to where illicit discharges may be occurring. The following is a list of resources that should be collected and reviewed and a brief description of factors to consider during the prioritization process:

- ◆ Zoning maps – Industrial areas with high density development may have a high illicit discharge potential.
- ◆ Locations of previous illicit discharges – Areas with historical illicit discharge reports or previous citizen complaints should be considered high priority.
- ◆ Approximate density of known outfalls per stream mile – Areas with a high density of outfalls should be considered high priority.
- ◆ Age of infrastructure/development – Older areas of the community should be considered high priority.
- ◆ Location of public sanitary sewer/age of sewer/date of separation – Older areas that were put on public sewer or separated long ago should be considered high priority.
- ◆ Location of areas on septic systems – Older areas on septic systems should be considered high priority.
- ◆ Water Quality Information

Water Quality Classification – Class A or Class B waterbodies may be high priority because their designated uses require the best water quality.

Maine DEP 303(d) list – Waterbodies listed as impaired because of urban runoff should be considered high priority.

Stream Team or Volunteer Monitoring Reports – Waterbodies that are at risk or sensitive should be considered high priority. Waterbodies that have ongoing water quality programs should have data that can be reviewed to determine if they should be considered high priority.

- ◆ Locations that drain to shellfish areas or public beaches – These areas should be designated as high priority for public health and economic reasons.

While it is important to identify areas where illicit discharges are likely to occur, it is also important to consider a waterbody's sensitivity to the impact of illicit discharges. For this reason, water quality information should be reviewed with an eye toward sensitivity (e.g., a waterbody listed as impaired may be less likely to recover from an illicit discharge and therefore should be considered high priority). It should be noted that the above list is not exhaustive. Program Managers may be aware of additional data pertinent to locating high priority areas in their community. Similarly, Program Managers may want to exclude some of this information if it is not relevant to identifying priority areas in their community. The evaluation can be qualitative, based on the Program Manager's personal knowledge and professional judgment.

2.2.3 Evaluate Illicit Discharge Potential

Once the Program Manager has an understanding of the waterbodies in the community, and has acquired and reviewed the available information, he/she can compile and evaluate the information to define areas of High, Medium, and Low priority. The CWP describes a procedure where each criterion is evaluated for each waterbody, and assigned an illicit discharge potential (IDP) of 3 for high potential, 2 for medium potential, and 1 for low potential. The scores for each waterbody are then averaged to produce a resultant overall score for the waterbody that will range from 3 (high priority) to 1 (low priority). The method is fairly simple and is illustrated in Table 2-3 (p. T-2-3). A worksheet that can be used by Program Managers to complete a similar analysis is shown in Table 2-4 (p. T-2-4).

Once the IDDE prioritization process is complete the subsequent list can be used to determine which areas should be mapped first (discussed in Section 2.3), develop community-specific detection techniques (Section 2.4), and even to prioritize storm drain system maintenance work (Section 3.3).

2.3 MAPPING THE SYSTEM

While the General Permit currently requires mapping only the outfalls of a storm drain system, most of the available guidance recommends mapping the entire system to facilitate illicit discharge detection investigations and maintenance work. This section will focus on developing a map of the storm drain system using Geographic Information Systems (GIS) since most of Stormwater Phase II regulated communities currently plan to use GIS to create their maps. Level 6 subwatershed maps for the Portland and Southern Maine Regulated Areas are provided in Figures 2-1 and 2-2 (pp. F-1 and F-2).

Storm drain system mapping should begin by acquiring and reviewing all existing data, much of which will have been acquired during the prioritizing task (see Section 2.2). Most communities will have existing maps of some sort in paper or electronic form, and these, along with the list of priority areas, should be reviewed to develop a strategy for mapping outfalls and other structures. A sample strategy for mapping a small community is as follows:

Equipment list for mapping:

1. Existing paper maps
2. Field sheets
3. Camera (preferably digital)
4. GPS Unit
5. Spray paint (or other marker)
6. Cell phones or hand-held radios
7. Clip boards and pencils
8. First aid kit
9. Flash light or head lamp
10. Surgical gloves
11. Tape measure
12. Temperature probe
13. Waders
14. Watch with a second hand
15. Five 1-liter sample bottles

1. Review/Office Preparation: Check existing available mapping data in high priority areas first, then in medium priority areas, then low priority areas (See Section 2.2.2 for a listing of possible resources). The Program Manager should decide on a numbering or naming system for outfalls and other structures. Establishment of a simple unique numbering system (SWO-0001, SWO-0002, etc.) will facilitate future inspections and documentation of maintenance. Outfalls can be marked in the field using spray paint or a paint pen. However, if a community wants to use signs or markers, these should be ordered ahead of time. Equipment for mapping should be obtained (see Equipment List, p. 2-5); and a schedule for completing mapping should be created. The Program Manager should measure the total number of stream, pond, lake, or ocean miles that should be walked, and prioritize how they should be completed. Some preliminary reconnaissance should be conducted to evaluate if watercraft are necessary to view the banks of the waterbody.
2. Field check: Using existing paper maps as a basis for locations, field personnel should start a mapping program by walking all named waterbodies within a given area of the community and collecting outfall location and design information using global positioning system (GPS) equipment capable of sub-meter (approximately 3-foot) accuracy. Use of a data logger and data collection software, such as Pathfinder®, will allow the generation of GIS files that will be useful for many years. Volume 2 contains an Outfall Characteristics Form (p. 2-10) and a Dry Weather Outfall Inspection Form (p. 2-9) that can be used to collect information in the field. The Outfall Characteristics Form contains basic location and design information that should be contained in the GIS database. The mapping should be conducted during dry weather to identify if any illicit discharges are present (see Section 2.4 Detection). Dry weather discharge information can either be collected on the paper forms for manual entry into a separate database at a later time, or can be directly entered into a database on a laptop or the data logger on-site. Both forms can be used to enter attributes and fields into the data dictionary for capture in the field with the data logger. Finally the outfall should be marked during mapping with its identifier for future location using spray paint, paint markers, or pre-manufactured signs.
3. Develop Initial GIS Maps: If the storm drain system is being mapped as part of a larger GIS database for the municipality, the data collected can be displayed with any of the existing data sets. If the storm drain system is not part of a larger data set, the Program Manager must determine what background the maps should be displayed on. Many communities prefer mapping to be displayed on aerial photographs. High resolution aerial photographs from a 2003 flight are available on the Maine Office of GIS website. Aerial photographs are one of the most interesting background

files to use to display information; however, their large file size (20 MB and larger) can make them impractical. An alternate way to display the mapped information consists of downloading either USGS quadrangles from the Maine Office of GIS, or a set of roads, waterbodies, and watershed information. Figure 2-3 (p. F-3) presents an example of a GIS map using USGS quadrangles and associated attribute table for a mapping project in South Eliot.

4. Review and field check other structures (catch basins, pipes, ditches, drain manholes, etc.): Once the outfall information has been collected and field checked, the remainder of the system can be mapped. Any paper maps of the system should first be scanned and digitized into GIS-compatible files. Then the new information should be field checked. An efficient way to do this is to send field staff along with catch basin cleaning crews to confirm catch basin locations, to observe the interior of structures, to determine which pipes enter and leave the structure, and to obtain design information on the pipes and structures. A GPS unit with a data logger can be used to record the location and design information related to the structures. The structures should be assigned unique identifiers (CB-00X for catch basins, DMH-00X for drain manholes, etc.), and a set of attributes and allowable fields to describe the structure.
5. Incorporate field data into GIS and revise as necessary: Once the GPS data files have been converted into GIS layers, and revised maps have been produced, these maps should be proofed to assess their accuracy and completeness. The reviewer should document any additional data requirements, and correct any errors in the information collected. A relational database can help illustrate connections between pipes, outfalls, and other structures.

It should be noted that there are many possible mapping strategies for a given municipality depending on the amount and format of available storm drain system data and the resources that are available. The strategy described above is presented as one way to complete mapping. For a small to medium size community (6,000 to 10,000 people), this process could take approximately two years to complete, depending upon availability of resources and land use.

2.4 DETECTION

Illicit discharges can be detected in many ways. A key component to detecting illicit discharges is conducting dry weather discharge inspections of outfalls. Initially, these inspections should be conducted during mapping and field checking. Sections 2.4.1 and 2.4.2 describe procedures that can be used during mapping and for longer term regular inspections after mapping is complete. Illicit discharges can also be detected

Dry Weather Discharge

The CWP defines **dry weather** as a 48 hour period with no runoff-producing rain fall. NEIWPCC defines dry weather as a 48-72 hour period with less than 1/10-inch rainfall. Each community should refine the definition of dry weather to suit its specific conditions.

while public works and other crews are conducting their regular work. These opportunistic inspections are described in Section 2.4.3. Illicit discharges can be detected through citizen call-in hotlines, but only if the community has identified and publicized the phone number. This program is described in Section 2.4.4. Finally, for areas where illicit discharges may occur because of failed septic systems, an active septic system inspection program may identify problem areas. This type of detection program is described in Section 2.4.5.

Determining which detection methods are appropriate for a community can be a relatively simple process. Table 2-5 (p. T-2-5) is a blank worksheet for use by Program Managers to retain or eliminate detection techniques. As Program Managers review sections 2.4.1 through 2.4.5 they should complete Table 2-5 to document which types of inspections are appropriate for different areas of the community, and should discuss inspection frequency in the table as well.

2.4.1 Dry Weather Inspections During Mapping

As described in Section 2.3, dry weather inspections during mapping can be an efficient way to gather illicit discharge information. The Dry Weather Outfall Inspection Form (see Volume 2, p. 2-9) can be used during mapping. The form should be completed whenever evidence of an illicit discharge, such as significant flow during dry weather, the presence of raw sewage indicators, staining, or residue, is observed.

2.4.2 Long-Term Dry Weather Inspections

Long-term, regular inspections of outfalls are a primary part of an effective IDDE program. Regular inspections will not be significantly different from inspections conducted during mapping. The Dry Weather Outfall Inspection Form can be used, and the major difference will be that a crew or inspector will have historical data to work with to make assessments. These inspections can be recorded in an electronic database (recommended, especially for medium to large communities) or paper forms can be kept (which may be appropriate for smaller communities).

The Program Manager should develop a schedule of long-term inspections for outfalls. The Center for Watershed Protection recommends inspecting all outfalls once, at a minimum, during the first permit cycle. Further inspections should be conducted as personnel and funds allow. Long-term inspections should be conducted during dry weather to maximize the potential to observe evidence of illicit discharges. While winter inspections can be productive, personnel should be aware of the potential for snowmelt during warmer days.

2.4.3 Opportunistic Inspections

Most public works crews conduct their regular duties in and around the storm drain system. A Program Manager may elect to have crews conduct outfall inspections on a formal basis (actually bringing an inspection form and equipment) while performing other work, or the Program Manager may elect to

have crews informally “keep a look out” for illicit discharges. If an employee observes evidence of an illicit discharge during an informal inspection, he/she should collect as much information about the potential illicit discharge as possible then contact their supervisor or dispatch office so that appropriate action can be taken. The Incident Tracking Sheet (see Volume 2, p. 2-11) can be used to collect the information observed. While it may not be reasonable to expect all public works employees to have copies of the form at all times, there are other ways to collect the information:

- ◆ The person observing the discharge can provide the information verbally to dispatch or the supervisor, who can then complete the Incident Tracking Sheet;
- ◆ The person can log as much information as they can recall onto the form upon returning to the office; or
- ◆ A third party (such as a code enforcement officer) dedicated to inspecting and tracing illicit discharges can be sent to the location as soon as possible were the potential illicit discharge was observed to collect the necessary information directly on the form.

It is important to collect as much information as possible at the time of initial observation because of the likelihood that a discharge may be transitory or intermittent. Initial identification of the likely or potential sources of the discharge is also very important.

2.4.4 Citizen Call-In Inspections

Citizen call-in programs are an important way to identify illicit discharges. Most municipalities have citizen comment or complaint lines that are publicized in the community. To maximize the effectiveness of citizen call-ins, dispatch personnel should be instructed on the use of the Illicit Discharge Hotline Incident Tracking Sheet in order to collect as much information as possible at the time of the report. Dispatch personnel should also be instructed as to where to direct the information so that appropriate action is taken. The Program Manager should identify on Table 2-5 who should be trained, and where the call-in line will be publicized.

2.4.5 Septic System Inspections

Septic system inspections can be conducted in older rural or low density areas that are prone to failed septic systems. Many communities elect to conduct these inspections around populated lakes, which are particularly susceptible to the adverse effects of a failed septic system. The Program Manager should review his/her community prioritization and determine if any areas might need septic system inspections.

Septic system inspections consist of a two-part analysis: 1) asking the homeowner a series of questions related to the septic system, and 2) completing a physical inspection of the septic system and surrounding area.

It should be noted that in Maine, inspections must be completed by a qualified professional such as a licensed site evaluator or an individual that has been certified by the Department of Health and Human Services Division of Health Engineering. Some communities may therefore need to hire an outside firm to complete this work.

2.5 TRACING ILLICIT DISCHARGES

Once an illicit discharge has been reported or detected through an inspection, the next step is to locate the source. Selection of tracing techniques will depend on the type of illicit discharge detected and the information collected during initial discovery and observation (whether through an inspection by a municipal employee or through a citizen call-in). A single technique may be used, or several techniques may need to be combined to identify the source of the discharge. Figure 2-4 (p. F-4) presents a flow chart for selecting tracing techniques that can be applied to the two categories of potential illicit discharges: (1) transitory or intermittent discharges (where upon returning to the site, no flow is present at the location where the illicit discharge was initially reported), and (2) continuous discharges (where upon returning to the site a continuous flow is present and the flow may be more easily traced to its source). Each of these circumstances is described below.

1. Transitory or intermittent discharges: These conditions may occur as a result of an inspection or a citizen complaint. While initial information may have been collected regarding the potential illicit discharge, a return trip may show that the discharge was either intermittent or transitory (e.g., no flow is present upon return to the site). The investigative techniques that should be used will depend on whether or not a potential source location was identified during the initial observation:

Potential source identified - If a potential source for the illicit discharge was initially identified, steps should be taken to investigate the potential source site, such as inspecting the site and storm drain system in the vicinity of the site. If floor drains, sumps or other suspect discharge locations are observed during this inspection, dye testing, electronic location of subsurface pipes, or televising may be used. These techniques should definitively show whether the suspect site was the source of the illicit discharge.

Potential source not identified - If no source site is suspected, and only the general area of the illicit discharge is known, it may be possible to trace the evidence of the illicit discharge by visual inspection of the storm drain access points. If this catch

basin/manhole inspection technique is not fruitful, some interim steps could be taken to try to trap water from an intermittent discharge. For example, sand bagging, damming or block testing of selected storm drain access points, combined with installation of an optical brightener trap to assess if detergents are present in a discharge, can help reveal the source of the discharge. If these techniques have no positive result (no water pools behind the weir or sand bag), the discharge was likely transitory (one time only), and it may not be possible to determine its origin. In this case, the location of the originally reported illicit discharge should be added to a regular inspection program to provide for the possibility of future incidents. If the original report of the illicit discharge was severe or gross pollution, then smoke testing or televising of the storm drain system may be warranted.

2. Continuous discharges: Tracing continuous discharges is typically more fruitful than tracing transitory or intermittent discharges. The primary difference between tracing a transitory or intermittent discharge and tracing a continuous discharge is that sandbagging and weirs are not required for continuous discharge. Visual observation of the system access points should reveal where the flow is coming from. Just as for tracing transitory or intermittent discharge, if visual inspections are not fruitful in identifying the source and the original report was severe or gross pollution, then televising, smoke testing, or sample collection would be warranted.

While these conditions may not cover the universe of discharges that may be discovered, they should provide general guidance on the selection of tracing techniques. The following subsection describes in more detail each of the techniques that can be applied, including their advantages and disadvantages.

2.5.1 Tracing Techniques

To select an effective tracing technique, one must have a good understanding of the technique and its limitations. The following is a brief summary of each of the tracing techniques that may be used to locate the source of an illicit discharge:

1. Visual Inspection at manholes/catch basins: This tracing technique is typically used when there is no suspected source site. It is the most cost effective and efficient method of tracing. Structures should be systematically inspected starting at the initial detection location, gradually working upstream through the system. If the crew is tracking a continuous discharge, the inspections may be relatively easy, and the flow can be tracked back to its source. If the crew is attempting to track a transitory or intermittent discharge, the crew should make the following observations depending on the information provided from the initial identification: color and clarity of any discharge, staining or deposits on bottom of structure; oil sheen, scum, or foam on any standing fluids in

sump of structure; odors, staining or deposits on inlet pipes and outlet pipes. Depending on what the crew is looking for, and what they find, they will progressively inspect additional structures until either a potential source is found, or no further evidence is found. If no further evidence is found the crew may elect to further assess some of the structures by installing sandbags or other damming devices to determine if the discharge recurs. Crews should use standard safety procedures when conducting these inspections such as cone placement and safety vests in traffic areas, confined space entry techniques (if entry is necessary), steel-toed boots, etc.

2. Sandbagging or damming: Sandbagging and damming is typically only conducted when the discharge flow has ceased since initial detection. Application of this technique will show whether the discharge is one time only (no water pools behind the sandbag or dam) or intermittent (water pools behind the sandbag). CWP provides the following explanation:

“This technique involves placement of sandbags or similar barriers such as caulk dams within strategic manholes in the storm drain network to form a temporary dam that collects any intermittent flows that may occur. Any flow collected behind the sandbag is then assessed using visual observations or by indicator sampling. Sandbags are lowered on a rope through the manhole to form a dam along the bottom of the storm drain, taking care not to fully block the pipe (in case it rains before the sandbag is retrieved). Sandbags are typically installed at junctions in the network to eliminate contributing branches from further consideration. If no flow collects behind the sandbar, the upstream pipe network can be ruled out as a source of the intermittent discharge. Sandbags are typically left in place for no more than 48 hours, and should only be installed when dry weather is forecast. Sandbags should not be left in place during a heavy rainstorm. They may cause a blockage in the storm drain, or, they may be washed downstream and lost. The biggest downside to sandbagging and damming is that it requires at least two trips to each manhole.” (CWP 2004, p. 157)

3. Optical brightener monitoring traps: Optical brightener monitoring (OBM) traps can be used to trace intermittent or transitory discharges that result from washwater with detergent. Detergents usually contain optical brighteners that can be detected at high concentrations using this method. However, CWP has found that the traps only pick up highly concentrated discharges. The detergent concentration required to be detected by the light is approximately the same as pure washwater from a washing machine. Consequently, OBM traps may be best suited as a simple indicator of presence or absence of intermittent flow or to detect the most concentrated flows. The traps can be made using easily acquired materials.

The traps contain an absorbent, unbleached cotton pad or fabric swatch contained inside a wire mesh trap or section of small diameter (e.g., 2-inch) PVC pipe. The traps should be anchored to the inside of an outfall at the invert using wire or monofilament that is secured to the pipe itself. Rocks can be used as temporary weights to hold the trap in place.

Field crews can retrieve the OBM traps after 24 to 72 hours of dry weather. OBM traps need to be retrieved before coming into contact with stormwater, which will contaminate the trap or wash it away. When placed under a fluorescent light, an OBM trap will indicate if it has been exposed to detergents. CWP reports that OBM traps have been used with some success in Massachusetts (Sargeant *et al.* 1998) and northern Virginia (Way 2000). For more detailed guidance on how to use OBM traps and interpret the results, see the Reference section for World Wide Web links to the studies and guidance manuals cited above.

4. Dye testing: Dye testing is typically conducted when a potential source site has been identified, and the crew is trying to determine whether the site has floor drains or other locations that connect and discharge to the storm drain system. Permission to access the site must be obtained before dye testing can be conducted. Verbal or written requests are acceptable. The crew should review available sanitary sewer and storm drain maps before conducting the dye testing. The dye testing procedure consists of two steps: (1) discharging the dye into the suspect location, and (2) opening nearby storm drain and sanitary sewer manhole covers to determine where the dye discharges to. This procedure is fairly effective for confirming direct connections into the storm drain system for short reaches. If a longer pipe network is being evaluated, charcoal packets can be left in selected structures and later collected and analyzed for the presence of the dye.
5. Televising: Televised video inspections are a useful technique when an illicit connection or infiltration from a nearby sanitary sewer is suspected, but little evidence of the illicit discharge remains behind. Two types of video cameras are available for use: (1) a small camera that can be manually pushed on a stiff cable through storm drains to observe the interior of the piping, or (2) a larger remote operated video camera on wheels that can be guided through storm drains to view the interior of the pipe. Typically the operator of the camera has access to a keyboard to record significant findings on the videotape that is produced for future review and evaluation.
6. Smoke testing: Smoke testing is a useful technique for tracing intermittent discharges or continuous discharges that have no apparent source site. Smoke is introduced into the storm drain system, and emerges at locations that are connected to the system. Smoke testing works best for short reaches of pipe, or in situations where pipe diameters are too small for video testing.

The Center for Watershed Protection provides the following discussion on planning and executing smoke testing:

“Notifying the public about the date and purpose of smoke testing before starting is critical. The smoke used is non-toxic, but can cause respiratory irritation, which can be a problem for some residents. Residents should be notified at least two weeks prior to testing, and should be provided the following information (Hurco Technologies, Inc. 2003):

- ◆ Date testing will occur
- ◆ Reason for smoke testing
- ◆ Precautions they can take to prevent smoke from entering their homes or businesses
- ◆ What they need to do if smoke enters their home or business, and any health concerns associated with the smoke
- ◆ A number residents can call to relay any particular health concerns (e.g., chronic respiratory problems)

Program managers should also notify local media to get the word out if extensive smoke testing is planned (e.g., television, newspaper, and radio). On the actual day of testing, local fire departments and 911 call centers should be notified to handle any calls from the public.

The basic equipment needed for smoke testing includes manhole safety equipment, a smoke source, smoke blower, and sewer plugs. Two smoke sources can be used for smoke testing. The first is a smoke “bomb,” or “candle” that burns at a controlled rate and releases very white smoke visible at relatively low concentrations. Smoke bombs are suspended beneath a blower in a manhole. Candles are available in 30 second to three minute sizes. Once opened, smoke bombs should be kept in a dry location and should be used within one year.

The second smoke source is liquid smoke, which is a petroleum-based product that is injected into the hot exhaust of a blower where it is heated and vaporized. The length of smoke production can vary depending on the length of the pipe being tested. In general, liquid smoke is not as consistently visible and does not travel as far as smoke from bombs.

Smoke blowers provide a high volume of air that forces smoke through the storm drain pipe. Two types of blowers are commonly used: “squirrel cage” blowers and direct-drive propeller blowers. Squirrel cage blowers are large and may weigh more than 100 pounds, but allow the operator to generate more controlled smoke output. Direct-drive propeller blowers are considerably lighter and more compact, which allows for easier transport and positioning.

Three basic steps are involved in smoke testing. First, the storm drain is sealed off by plugging storm drain inlets. Next, the smoke is released and forced by the blower through the storm drain system. Lastly, the crew looks for any escape of smoke above-ground to find potential leaks.

One of three methods can be used to seal off the storm drain. (1) Sandbags can be lowered into place with a rope from the street surface. (2) Alternatively, beach balls that have a diameter slightly larger than the drain can be inserted into the pipe. The beach ball is then placed in a mesh bag with a rope attached to it so it can be secured and retrieved. If the beach ball gets stuck in the pipe, it can simply be punctured, deflated and removed. (3) Finally, expandable plugs are available, and may be inserted from the ground surface.

Blowers should be set up next to the open manhole after the smoke is started. Only one manhole is tested at a time. If smoke candles are used, crews simply light the candle, place it in a bucket, and lower it in the manhole. The crew then watches to see where smoke escapes from the pipe. The two most common situations that indicate an illicit discharge are when smoke is seen rising from internal plumbing fixtures (typically reported by residents) or from sewer vents. Sewer vents extend upward from the sewer lateral to release gas buildup, and are not supposed to be connected to the storm drain system.” (CWP 2004, p. 165-166)

7. Indicator Monitoring: As shown in Figure 2-4, samples should be collected only in the event that the other investigative techniques have failed to reveal the source of an illicit discharge. Samples should be collected by personnel trained in safety and proper collection techniques. Table 2-6 (p. T-2-6) lists the parameters that a sample may be analyzed for and provides a general discussion of how the results may be interpreted. This table was taken from the CWP manual which provides a more detailed discussion of sampling procedures and analysis of results. Figure 2-5 (p. F-5) provides a flow chart for indicator monitoring.

The CWP describes four techniques a Program Manager can use to select which types of analyses should be conducted for a given discharge. Two of the techniques apply to illicit discharges in residential areas: (1) The Flow Chart Method and (2) The Single Parameter Method. The third method is used for illicit discharges in industrial areas: the Industrial Flow Benchmarks. The fourth method, the Chemical Mass Balance Model, is a sophisticated statistical technique to identify flow types at outfalls with blended flows. This method involves development of a Chemical Library of the characteristics of local groundwater, surface water, irrigation water, and illicit discharges for use in the model which can be time consuming and costly.

CWP provides the following explanations of the Flow Chart Method and the Single Parameter Method:

The Flow Chart Method: The Flow Chart Method is recommended for most Phase II communities, and was originally developed by Pitt *et al.* (1993) and Lalor (1994) and subsequently updated based on new research by Pitt during this project. The Flow Chart Method can distinguish four major discharge types found in residential watersheds, including sewage and wash water flows that are normally the most common illicit discharges. Much of the data supporting the method was collected in Alabama and other regions, and some local adjustment may be needed in some communities. The Flow Chart Method is recommended because it is a relatively simple technique that analyzes four or five indicator parameters that are safe, reliable and inexpensive to measure. The basic decision points involved in the Flow Chart Method are...described below:

Step 1: Separate clean flows from contaminated flows using detergents

The first step evaluates whether the discharge is derived from either sewage or washwater sources, based on the presence of detergents. Boron and/or surfactants are used as the primary detergent indicator. Values of boron or surfactants that exceed 0.35 mg/L or 0.25 mg/L respectively, signal that the discharge is either contaminated by sewage or washwater.

Step 2: Separate washwater from sewage using the Ammonia/Potassium ratio

If the discharge contains detergents, the next step is to determine whether they are derived from sewage or washwater, using the ammonia to potassium ratios. A ratio greater than 1.0 suggests sewage contamination, whereas ratios less than one indicate washwater contamination. The benchmark ratio was developed by Pitt *et al.* (1993) and Lalor (1994) based on testing in urban Alabama watersheds.

Step 3: Separate tap water from natural water

If the sample is free of detergents, the next step is to determine if the flow is derived from spring/groundwater or comes from tap water. The benchmark indicator used in this step is fluoride, with concentrations exceeding 0.60 mg/L indicating that potable water is the source. Fluoride levels between 0.13 and 0.6 may indicate non-target irrigation water. The purpose of determining the source of a relatively “clean discharge” is that it can point to water line breaks, outdoor washing, non-target irrigation and other uses of municipal water that generate flows with pollutants.

The Single Parameter Screening Method: This method suggests that detergent is the best single parameter to detect the presence or absence of the most common illicit discharges (sewage and washwater). Because the recommended analytical method for detergents uses a hazardous reagent, the analysis needs to be conducted in a controlled laboratory setting with proper safety equipment. This may limit the ability of a community to use this method if it is conducting analyses in the field or in a simple office lab.

Ammonia is another single parameter indicator that has been used by some communities with widespread or severe sewage contamination. An ammonia concentration greater than 1 mg/L is generally considered to be a positive indicator of sewage contamination. Ammonia can be analyzed in the field

using a portable spectrophotometer, which allows for fairly rapid results. This gives crews the ability to immediately track down sources and improper connections using pipe testing methods.

As a single parameter, ammonia has some limitations. First, ammonia by itself may not always be capable of identifying sewage discharges, particularly if they are diluted by “clean” flows. Second, while some washwaters and industrial discharges have relatively high ammonia concentrations, not all do, which increases the prospects of false negatives. Lastly, other dry weather discharges, such as non-target irrigation, can also have high ammonia concentrations that can occasionally exceed 1 mg/L. Supplementing ammonia with potassium and looking at the ammonia/potassium ratio is a simple adjustment to the single parameter approach that helps to further and more accurately characterize the discharge. Ratios greater than 1.0 indicate a sewage source, while ratios less than or equal to one indicate a washwater source. Potassium is easily analyzed using a probe (Horiba Cardy™ is the recommended probe).” (CWP 2004, p. 130-133)

2.6 REMOVING ILLICIT DISCHARGES

Regulated MS4 communities are required to adopt an ordinance or other regulatory mechanism to prohibit illicit discharges to their storm drain system. The Maine Municipal Association (MMA) has developed a sample ordinance for use by the regulated MS4s, which describes enforcement procedures that can be taken in the event of discovery of an illicit discharge. As of publication of this manual, most communities have adopted an ordinance or other regulatory mechanism similar to the MMA sample ordinance. This section describes the procedures that should be taken for removal assuming an ordinance has been adopted that is similar to the MMA ordinance.

Table 2-7 (p. T-2-7) summarizes the procedures that should be followed to ensure a timely and complete removal depending on the types of illicit discharges that may be discovered, and the various responsible parties. For most cases, the enforcement authority for the ordinance will coordinate discharge removal.

The following subsections address the issues of financial responsibility for removal (Section 2.6.1), forms and procedures that can be used in association with issuing notices of violation (NOVs) (Section 2.6.2), circumstances in which a municipality can take emergency action for discharges that are a threat to human health or the environment (Section 2.6.3), and procedures to follow when an illicit discharge from an exempt party is identified (Section 2.6.4).

2.6.1 Financial Responsibility

Once an illicit discharge’s source has been identified, the financial responsibility of removing it must be determined. The MMA ordinance allows imposition of a fine to the person causing the illicit discharge.

It should be noted that some illicit discharges may originate from legal connections to the storm drain system. For example, a washing machine discharging through a basement sump that was a municipally approved connection to the storm drain system would be considered an illicit discharge. The connection was legal, and the MMA ordinance does not require disconnection. The ordinance requires only that the washing machine be disconnected from the sump discharge. The sump connection to the storm drain system, that was legally made, can remain.

Some illicit discharges may result from illegal connections (i.e., connections that violate state plumbing codes). For intermittent or continuous discharges that are the result of an illegal direct connection into the storm drain system, the cost for disconnection will fall to either the property owner of the illegal connection or the municipality, depending on the circumstances of the connection. For example, if the connection was incorrectly applied during a separation project conducted by the municipality, the cost to correct the connection should be borne by the municipality. If the connection was the result of a private contractor working for the resident, the resident would be financially responsible for correcting the connection. Similarly, if the illicit discharge is the result of a failed sanitary sewer line, the party responsible for the failed sanitary sewer line must pay for the correction.

2.6.2 Notice of Violation

For violations of the municipal ordinance, most municipalities will want to issue a notice of violation. Although most code enforcement officers will have their own forms, a blank letter is provided for use in Volume 2, p. 2-13. It should be noted that the NOV describes a schedule for the removal to be completed, as well as a summary of any agreements between the parties.

2.6.3 Emergency Suspensions

The MMA sample ordinance allows a municipality to suspend access to the storm drain system for discharges that present “imminent and substantial danger to the environment or to the health or welfare of persons, or to the storm drain system”. The ordinance states that the suspension may include “blocking pipes, constructing dams or taking other measures on public ways or public property to physically block the Discharge”. The municipal enforcement authority for the ordinance may want to call the Maine DEP Oil and Hazardous Spill Reporting Hotline when making this determination for suspension. The hotline number is 800-482-0777.

2.6.4 Discharges from Exempt Parties

Several categories of facilities are regulated by Maine DEP and/or US EPA for stormwater discharges under other permits. Because these facilities are already responsible to one enforcement authority for stormwater discharges, they have been identified in the MMA sample ordinance as being exempt from the ordinance. If a municipality encounters an illicit discharge that is suspected or determined to be coming from an exempt party that is regulated under some other stormwater regulation, the municipality should notify both the suspected discharger and the

enforcement authority for that discharger. The notification can be verbal or in writing. Most municipalities have prior experience working with other enforcement authorities for suspected violations of either state or federal law.

The following is a brief list of parties that are exempt from the MMA sample ordinance because they are regulated under an alternate program:

| Exempt Facility | Alternate Regulation They Are Subject To | Enforcement Authority |
|--|--|---|
| Maine Turnpike Authority and Maine DOT (in selected urbanized areas) | Maine General Permit for the Discharge of Stormwater from MTA and MDOT MS4s | Maine DEP |
| Portsmouth Naval Shipyard, Southern Maine Community College, USM Gorham, Bangor Air National Guard | Maine General Permit for the Discharge of Stormwater from State and Federally Owned MS4s | Maine DEP |
| Industrial Facilities with selected SIC codes (See Table 2-8 for a complete list) | Multi Sector General Permit for Industrial Activities | USEPA (Until 10/2005) Maine DEP (After 10/2005) |

As shown in Table 2-7 (p. T-2-7), if a municipality identifies that an illicit discharge has come from one of these facilities, they should notify both the discharger and the enforcement authority in writing of the activity.

2.7 TRACKING ILLICIT DISCHARGES

Developing a long-term tracking program can help Program Managers better understand the origins of illicit discharges and identify maintenance issues for the storm drain system structures. A tracking program will also facilitate evaluation of the overall IDDE program and will expedite annual reporting. An effective tracking program should address illicit discharge and maintenance issues resulting from the following:

- ◆ Citizen complaints
- ◆ Opportunistic inspections
- ◆ Regular longer term inspections
- ◆ Removal actions taken for illicit discharges

For smaller communities, an effective tracking system can be as simple as maintaining a three-ring binder with paper copies of all the forms that document the citizen complaints, inspections, and follow up information. The binder should be organized by priority area, with a listing in the front of each section or a map showing all the structures that are contained in that section. Because each structure is assigned a unique identifier, the information within the sections can be ordered by structure type and then by unique identifier. This method could become cumbersome for a medium or larger community.

Sample Organization for Three Ring Binder:

Area A

- Outfall Structures (SWO-001, SWO-002, etc)
- Catchbasins (CB-001, CB-002, etc.)
- Drain Manholes (DMH-001, DMH-002, etc.)

Area B

- Outfall Structures (SWO-010, SWO-013, etc)
- Catchbasins (CB-104, CB-102, etc.)
- Drain Manholes (DMH-025, DMH-002, etc.)

Databases provide an excellent way to organize large quantities of information, allowing retrieval at a later time of selected information as needed. Databases work nicely with GIS systems because the GIS database system can be related to a larger database that stores more rapidly changing data that will increase in volume over time. The ASIST MS4 Professional database could be used to track the IDDE program, or a separate database program could be developed. The two database options are discussed in the following subsections.

Standard Industrial Classification (SIC) codes for NPDES Stormwater Multi-Sector Permit (MSGP) Industrial Facilities are listed in Table 2-8 (p. T-2-8).

2.7.1 ASIST MS4 Professional Database

The ASIST program offers a user friendly environment for data collection and storage. The program is comprehensive, allowing storage of long-term inspection information, opportunistic inspection information, citizen complaint information, and analytical data that may be collected as part of an illicit discharge investigation. The program allows mapped data already collected as part of a GIS program to be imported as a Microsoft Access database with minimal modifications, in order to create a baseline data set. The database allows multiple users to input new or additional information to keep the database current.

The program also offers a field station export capability designed to be used with a laptop computer. The Program Manager or crew leader can export selected inspections to be conducted to the laptop, while crews can collect inspection data on the laptop in the field and then export it to the central database back in the office.

The data contained in the ASIST database can be linked to a GIS database for viewing in the GIS environment. This is accomplished by first exporting the data from the ASIST database into Microsoft Access tables using the utilities feature of the program. The data is sorted into 23 separate tables that are all related by unique identifiers that ASIST creates. These tables are then accessed by the GIS program by “relating” the GIS shape file to the Access tables. Each table must be related separately, and this task can be time consuming. It is likely that only communities with a full-time GIS operator will be using this method to view the ASIST data in the GIS environment. Communities without full time GIS operators should use the GIS and ASIST databases as separate programs.

While this program is comprehensive and could contain all the information necessary to a good tracking program, it may contain too many options to be practical unless it is to be used on a regular basis by a dedicated user.

Finally, to access selected data from the ASIST database that can be used to evaluate the IDDE program and complete an annual report, a special report must be created using the ASIST *Report* feature. This report can allow selection of

custom information such as: an evaluation of how many citizen reports of illicit discharges have been identified versus how many were resolved, a comparison of how illicit discharges have been identified, or a comparison of how many illicit discharges have been identified in each priority area of the municipality.

2.7.2 Customized Database

A separate option for IDDE tracking is to set up a distinct Access database that includes all the fields on the Dry Weather Outfall Inspection Form. The advantage to this tracking program is that this Access database can be easily linked to the GIS. Linking to a GIS allows mapping of illicit discharge locations, citizen complaint locations, and many other IDDE issues which can assist greatly in the overall program.

2.8 EVALUATING THE PROGRAM

Program Managers should evaluate their IDDE program at the end of each year to assess if it is effective and efficient. Table 2-9 (p. T-2-9) is a worksheet that Program Managers can use to evaluate the following components:

1. Priority Areas: Are the priority areas initially identified still appropriate? Considerations should include reviewing the priority worksheet to assess if any changes have occurred since the initial evaluation was completed (such as: Have additional illicit discharges been discovered in any of the areas? Has a new 303(d) list come out naming new waterbodies as impaired?)
2. Detection Program: Is the detection program effective? Documenting the number of illicit discharges detected by the various detection mechanisms (opportunistic inspections, mapping inspections, citizen call-ins, or long-term inspections) can help a Program Manager decide where to allocate resources.
3. Tracing Techniques: What tracing techniques were generally used? What tracing techniques were generally effective? In how many instances were visual inspections of the area sufficient to identify the source of the illicit discharge? Were there any times the equipment necessary to effectively trace an illicit discharge wasn't used because it was not available, or was too costly to obtain? Documenting the effectiveness of tracing techniques can help Program Managers to be more efficient.

Although completing an evaluation of the overall IDDE program may be time consuming, its benefits may include reduced costs for future inspection and IDDE efforts. Keeping track of where illicit discharges are likely to occur and what techniques are useful can save a municipality time and money.

3. POLLUTION PREVENTION AND GOOD HOUSEKEEPING

Many municipal activities can result in stormwater pollution if not conducted properly. Activities such as vehicle maintenance, fueling, and landscaping involve handling, storage, and use of chemicals and petroleum products that must be used properly to prevent stormwater from becoming polluted. In addition, construction activities conducted during general maintenance of infrastructure can result in sedimentation and erosion of soil that can be swept by stormwater into the storm drain system or directly into waterbodies.

The Pollution Prevention/Good Housekeeping components of the General Permit require that municipalities re-evaluate how they manage the municipal infrastructure and develop procedures that are protective of stormwater, and ultimately the waterbodies the stormwater discharges to. The specific language for required items is listed in Part IV (D)(6)(a) of the General Permit:

- i. The permittee shall develop and implement an operation and maintenance program that includes a training component for municipal employees and contractors and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.*
- ii. Using training materials that are available from the EPA, the State or other organizations, this program must include employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance.*
- iii. The permittee shall develop and implement a program to sweep all publicly accepted paved streets and publicly owned paved parking lots at least once a year as soon as possible after snowmelt.*
- iv. The permittee shall develop and implement a program to evaluate and, if necessary, clean catch basins and other stormwater structures that accumulate sediment at least once a year and dispose of the removed sediments in accordance with current state law.*
- v. The permittee shall develop and implement a program to evaluate and, if necessary, prioritize for repairing, retrofitting or upgrading the conveyances, structures and outfalls of the regulated small MS4.*

Part IV (D)(6)(b) of the General Permit also suggests, at a minimum, that the following items be considered in developing a Pollution Prevention/Good Housekeeping program:

- i. Structural and non-structural stormwater controls to reduce floatables and other pollutants discharged from your separate storm sewers.*
- ii. Controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, fleet or maintenance shops with outdoor storage areas, salt/sand storage locations, snow disposal areas, and waste transfer stations.*
- iii. Procedures for properly disposing of waste removed from the separate storm sewers and areas listed above (such as dredge spoil, accumulated sediments, floatables, and other debris).*
- iv. Ways to ensure that new flood and stormwater management projects assess the impacts on water quality and examine existing projects for incorporating additional water quality protection devices or practices.*
- v. Implement an operation and maintenance plan for all stormwater management structures. This measure is intended to improve the efficiency of these systems and require new programs where necessary.*

This chapter addresses all of the required components of the General Permit, as well as the first three suggested components, listed above. To address these components, the Chapter is divided into four subsections that describe four major categories of operations completed by municipalities: Vehicle/Equipment Maintenance (Section 3.1), Facilities Maintenance (Section 3.2), Storm Drain System Maintenance (Section 3.3), and Construction Activities (Section 3.4).

Each of these four operational areas contains a diverse set of activities, for which SOPs are appropriate. SOPs associated with each of these operational areas are contained in Volume 2, Chapter 3. The SOPs summarize the best management practices that should be used to minimize impacts on stormwater. Some of the SOPs apply to more than one operational area. For example, both vehicle maintenance and facilities maintenance require handling, storage, and disposal of petroleum products. Therefore, the SOPs for petroleum handling, storage and disposal in Volume 2 address both of these operational areas. Table 3-1 (p. T-3-1) shows the relationship between the SOPs that are contained in Volume 2, and the operational areas that are described in this Chapter.

3.1 VEHICLE/EQUIPMENT MAINTENANCE

Vehicle and equipment maintenance activities can pose a significant threat to stormwater. The USEPA considers automotive maintenance facilities to be potential sources of petroleum, trace metals, antifreeze, and sediments that can contaminate stormwater runoff (USEPA 2004). Many petroleum products and chemicals are handled, stored, and disposed of on a regular basis during vehicle maintenance. Proper handling, storage, and disposal are critical to preventing contact with stormwater. Exterior storage of supplies, spare parts, vehicles, and equipment can be a source of stormwater pollution. Generally, good housekeeping and proper management of wastes can have a significant impact on stormwater runoff quality. The SOPs related to vehicle maintenance activities have three basic themes:

- (1) Store inside whenever possible.

- (2) Handle with care to avoid spills.
- (3) Recycle or dispose of properly.

The SOPs associated with Vehicle Maintenance activities provide best management practices to follow. Program Managers should review the “Whenever Possible” components of the SOPs and make determinations as to which components will work for their facility. Table 3-2 (p. T-3-2) is a worksheet to assist Program Managers in selecting the components of the program their facility will follow. Table 3-2 addresses the following categories:

Floor Drains: Floor drains should either be connected to a regularly maintained holding tank or to a regularly maintained oil/water separator that discharges to the sanitary sewer. If the discharge location is unknown, it can be determined by televising or dye testing (see Chapter 2 for discussion of advantages and disadvantages of each method). If floor drains do not connect to one of these two devices they should not be used. The facility should connect the floor drains to the appropriate device or close and seal the floor drains, and run a “dry shop”. All floor drains, whether active or sealed, must be registered with the Maine DEP Underground Injection Control Program (207-287-7814).

Parts Cleaning: If chlorinated solvents are used, they should be disposed of as hazardous waste by a licensed contractor. Citrus based cleaners can be recycled by an off-site contractor reducing overall cost of its use. Steam cleaning or use of a commercial washer allows discharge to the sanitary sewer. Using non-hazardous chemicals reduces the risk of stormwater pollution.

Petroleum Storage: Areas should be kept clean and neat. Regular inspection and use of spill adsorbent and pads can minimize impacts to stormwater in exterior areas. If a facility has a total storage capacity in excess of 1,320 gallons for bulk petroleum products (55-gallon size containers), the facility needs a Spill Prevention, Control, and Countermeasure (SPCC) Plan, in accordance with 40 CFR Part 112 (federal environmental regulations). Generally, facilities with this quantity of storage capacity are at greater risk for spills and leaks that can impact stormwater. Implementation of the SPCC Plan can reduce the potential for contact with stormwater.

Vehicle Storage: Vehicles should be stored on impervious areas that are inspected on a regular basis and which can be cleaned with a street sweeper as necessary. Drip pans should always be used to collect leaking fluids. A dedicated, convenient storage area should be provided and clearly labeled for the drip pans and for the fluids they will contain.

Vehicle Washing: Vehicles should be washed in a dedicated area that can appropriately handle the runoff. Preferably, vehicles should be washed in a dedicated wash bay that is equipped with an oil/water separator connected to the sanitary sewer. If it is not feasible to install such a system, washing in an area with sufficient buffers to diffuse the washwater and allow infiltration is a viable alternative. Engine washing and undercarriage washing should only be conducted in areas where the washwater is collected and treated.

Vehicle Fueling: Vehicle fueling areas are a significant generation point for petroleum contamination of stormwater. Vehicle fueling areas should be inspected and swept with a street sweeper on a regular basis. A spill kit and covered garbage container should be located near the fueling area and should be well labeled for individuals to use when needed.

Completing Table 3-2 and using the SOPs in Volume 2 will provide documentation of a reasonable and effective Operation and Maintenance program for vehicles and equipment that will be protective of stormwater.

An important component of stormwater protection at vehicle and equipment maintenance facilities is general good housekeeping. Conducting regular inspections of a facility can be an effective pollution prevention technique. Table 3-3 (p. T-3-3) is an inspection checklist that should be used on a regular basis to identify areas of potential storm water pollution. The form can be modified to suit a specific vehicle maintenance facility. The Program Manager should determine an appropriate frequency for inspection.

3.2 FACILITIES MAINTENANCE

Most municipalities own and operate buildings, parks, and other green spaces. General maintenance activities include mowing and trimming, painting, pest control, weed control, and all of the chemical and petroleum handling that is associated with these activities. The SOPs contained in Volume 2 provide best management practices to protect stormwater from the potential hazards associated with each of these activities. Facilities maintenance personnel should be trained in each of the SOPs associated with their job.

3.3 STORM DRAIN SYSTEM MAINTENANCE

Storm drain system maintenance consists of three components: cleaning, repairing (or retrofitting), and upgrading. The General Permit requires that catch basins be cleaned on an annual basis. Historically, storm drain systems have been repaired or upgraded only when catastrophic failures have occurred, such as those causing flooding, road failures, or severe erosion. The General Permit requires that each regulated municipality develop an Operation and Maintenance program for the repair, retrofit, or upgrade of the storm drain system.

Section 2.2 of this manual reviews how the Program Manager can divide a municipality into distinct areas and prioritize the areas based on their illicit discharge potential. A component of that evaluation considers the age and material of the infrastructure, which is an indicator of failure potential. This prioritization should be reviewed and used to develop a maintenance program for the system. Additional useful resources include the capital budget and the GASB 34 accounting information. All of these items should be reviewed and evaluated to identify where and when repairs, retrofits and upgrades should be conducted. The storm drain system operation and maintenance program can be developed using a process that is similar to the pavement management program described below.

1. Vitrified clay storm drain pipe or asbestos cement pipe in older areas should be replaced or retrofitted as part of other infrastructure work (street reconstruction, or CSO work). Televising and/or manual inspections should be performed to confirm the degree of repair or replacement necessary.
2. An inspection and replacement program should be developed for newer pipes and structures in order to conduct preventative maintenance that can affect long-term cost savings and avert catastrophic failures. The inspection and replacement program should consist of the following items:

Storm Drain Pipe/Outfall Cleaning and Inspections – A cleaning and inspection prioritization should be established for storm drain pipes and

outfalls. The Program Manager should consider conducting annual inspections on storm drains and outfalls in high priority areas. Less frequent inspections (every 2 to 3 years) should be completed for medium and low priority areas. Inspections for structural conditions should be combined with the inspections for illicit discharges as described in Section 2.4.2.

Catch basin Cleaning and Inspection – A prioritization plan should also be established for catch basin cleaning. The prioritization can be completed by the Program Manager using the following two considerations: (1) amount of sand spread in different areas, and (2) areas that have historically accumulated a large quantity of sediment or debris. Most communities that conduct separation activities for combined sewers have already developed a prioritization for cleaning as part of their master planning. This prioritization should be reviewed and updated, especially if separated areas have been dropped from the prioritization. The re-evaluation should use the same two criteria listed above (sand application and historical sediment accumulation). Program Managers should identify a reasonable frequency of cleaning based on need, municipal budgets, and personnel availability.

The Catch Basin Cleaning Form contained in Volume 2, p. 2-12, should be used during cleaning as a method to inspect the catch basins to evaluate the integrity of the structure and identify necessary repairs. Any repairs identified on the forms should be incorporated into the municipality's work order system. Communities that outsource catch basin cleaning should either require that the contractor use the inspection form or should consider sending a public works employee, intern, or other municipal representative along with the contractor to evaluate structures.

Disposal of catch basin cleaning liquids and solids should be done in accordance with all pertinent regulations and the Maine DEP *Guidance on Disposal and Use of Assorted Solid Wastes Generated in Maine*.

3.4 CONSTRUCTION ACTIVITIES AND OTHER LAND DISTURBANCES

As municipalities perform construction activities and other activities which disturb soil, they should take precautions to prevent erosion and runoff of sediment. Road crews and landscaping crews should be trained in erosion and sediment control methods. The Maine DEP publication *Best Management Practices Manual for Sediment and Erosion Control* describes a variety of methods that are appropriate for a wide range of situations. The Manual describes proper use and installation techniques. The Maine DEP Non-Point Source Training Center offers training sessions for this manual. In particular, the Contractor Certification Program is appropriate for public works crews. The Maine Local Roads program offered by the Maine DOT also offers training sessions for erosion/sediment control titled, "Drainage, Drainage, Drainage".

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Table 2-1: LAND USES, LIKELY SOURCE LOCATIONS AND ACTIVITIES THAT CAN PRODUCE TRANSITORY OR INTERMITTENT ILLICIT DISCHARGES

| Land Use | Likely Source Locations | Condition or Activity that Produces Discharge |
|-------------|---|---|
| Residential | <ul style="list-style-type: none"> • Apartments • Multi-family • Single Family Detached | <ul style="list-style-type: none"> • Car Washing • Driveway Cleaning • Dumping/Spills (e.g., leaf litter and RV/boat holding tank effluent) • Equipment Wash-downs • Lawn/Landscape Watering • Septic System Maintenance • Swimming Pool Discharges |
| Commercial | <ul style="list-style-type: none"> • Campgrounds/RV Parks • Car Dealers/Rental Car Companies • Car Washes • Commercial Laundry/Dry Cleaning • Gas Stations/Auto Repair Shops • Marinas • Nurseries and Garden Centers • Oil Change Shops • Restaurants • Swimming Pools | <ul style="list-style-type: none"> • Building Maintenance (power washing) • Dumping/Spills • Landscaping/Grounds Care (irrigation) • Outdoor Fluid Storage • Parking Lot Maintenance (power washing) • Vehicle Fueling • Vehicle Maintenance/Repair • Vehicle Washing • Wash-down of Greasy Equipment and Grease Traps |
| Industrial | <ul style="list-style-type: none"> • Auto recyclers • Beverages and brewing • Construction vehicle washouts • Distribution centers • Food processing • Garbage truck washouts • Marinas, boat building and repair • Metal plating operations • Paper and wood products • Petroleum storage and refining • Printing | <ul style="list-style-type: none"> • All Commercial Activities • Industrial Process Water or Rinse Water • Loading and Un-loading Area Wash-downs • Outdoor Material Storage (fluids) |
| Municipal | <ul style="list-style-type: none"> • Airports • Landfills • Maintenance Depots • Municipal Fleet Storage Areas • Ports • Public Works Yards • Streets and Highways | <ul style="list-style-type: none"> • Building Maintenance (power washing) • Dumping/Spills • Landscaping/Grounds Care (irrigation) • Outdoor Fluid Storage • Parking Lot Maintenance (power washing) • Road Maintenance • Emergency Response • Vehicle Fueling • Vehicle Maintenance/Repair • Vehicle Washing |

SOURCE: Modified from *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, Center for Watershed Protection, 2004, p. 12, Table 2.

| Table 2-2: LAND USES, LIKELY SOURCE LOCATIONS AND ACTIVITIES THAT CAN PRODUCE <u>CONTINUOUS</u> ILLICIT DISCHARGES | |
|---|--|
| Land Use | Condition or Activity that Produces Discharge |
| Residential | <ul style="list-style-type: none"> • Failed sanitary sewer infiltrating into storm drain • Sanitary sewer connection into storm drain • Failed septic systems discharging to storm drain system |
| Commercial/Industrial | <ul style="list-style-type: none"> • Failed sanitary sewer infiltrating into storm drain • Process water connections into storm drain • Sanitary sewer connection into storm drain |
| Municipal | <ul style="list-style-type: none"> • Failed sanitary sewer infiltrating into storm drain • Sanitary sewer connection into storm drain |

| Table 2-3: PRIORITIZING AREAS USING AVAILABLE INFORMATION | | | | | | |
|--|-----------------|-------------------------------------|---|---|----------------------|-------------------------------|
| | Land Use | MDEP Category on 303(d) List | Density of stormwater outfalls (# of outfalls per stream mile) | Average age of development (years) | Raw IDP Score | Normalized IDP Score** |
| Area A | Commercial (2)* | Impaired (not Urban Runoff) (2)* | 14 (2)* | 40 (2)* | 8 | 2 |
| Area B | Residential (1) | Not Impaired (1) | 10 (2) | 10 (1) | 5 | 1.25 |
| Area C | Industrial (3) | Impaired (Urban Runoff) (3) | 16 (2) | 75 (3) | 11 | 2.75 |
| Area D | Residential (1) | Not Impaired (1) | 9 (1) | 15 (2) | 5 | 1.25 |
| Area E | Residential (1) | No data available | 21 (3) | 20 (1) | 5 | 1.67 |

Notes:
 * The number in parentheses is the Illicit Discharge Potential (IDP) "score" (with 3 defined as a high IDP) earned for that area for the category identified. Basis for assigning scores (based on benchmarks) to assess IDP is defined as follows:
Land Use: Industrial = High (3), Commercial = Medium (2), Residential = Low (1)
MDEP Category: Impaired – Urban Runoff = 3, Impaired – not Urban Runoff = 2, Not Impaired = 1
Stormwater outfall density: 10 = 1; 10-20 = 2; 20 = 3
Average age of development: 25 = 1; 25-50 = 2; 50 = 3
 ** Normalizing the raw IDP scores (by dividing the raw score by the number of screening factors assessed) will produce scores that fall into the standard scale of 1 to 3 for low to high IDP, respectively.

SOURCE: Modified from *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, Center for Watershed Protection, 2004, p. 53, Table 15.

Table 2-4: WORKSHEET TO PRIORITIZE AREAS

| Area of Community | Categories of Information Reviewed | | | | | Raw Score | Normalized IDP Score |
|-------------------|------------------------------------|--|--|--|--|-----------|----------------------|
| | | | | | | | |
| | | | | | | | |
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Category Definitions

| | | | | |
|------------|--|--|--|--|
| (3) High | | | | |
| (2) Medium | | | | |
| (1) Low | | | | |

Table 2-5: WORKSHEET TO DEVELOP A DETECTION PROGRAM

| Type of Detection Program | Retained/Eliminated from Municipal IDDE Program (Provide Discussion) |
|-----------------------------------|---|
| Inspections During Mapping | |
| Area A | |
| Area B | |
| Area C | |
| Area D | |
| Area E | |
| Longer Term Inspections | |
| Area A | |
| Area B | |
| Area C | |
| Area D | |
| Area E | |
| Opportunistic Inspections | |
| Citizen Call-In Program | |
| Septic System Inspections | |
| Area A | |
| Area B | |
| Area C | |
| Area D | |
| Area E | |

Table 2-6: INDICATOR PARAMETERS USED TO DETECT ILLICIT DISCHARGES

| Parameter | Discharge Types it can Detect | | | | Laboratory/Analytical Challenges |
|--|-------------------------------|-----------|-----------|--|---|
| | Sewage | Washwater | Tap Water | Industrial or Commercial Liquid Wastes | |
| Ammonia | ● | ☐ | ○ | ☐ | Can change into other nitrogen forms as the flow travels to the outfall. |
| Boron | ☐ | ☐ | ○ | * | |
| Chlorine | ○ | ○ | ○ | ☐ | High chlorine demand in natural waters limits utility to flow with very high chlorine concentrations. |
| Color | ☐ | ☐ | ○ | ☐ | |
| Conductivity | ☐ | ☐ | ○ | ☐ | Ineffective in saline waters, generally highly variable. |
| Detergents - Surfactants | ● | ● | ○ | ☐ | Reagent is a hazardous waste. |
| E. coli Enterococci Total Coliform | ☐ | ○ | ○ | ○ | 24-hour wait for results. Need to modify standard monitoring protocols to measure high bacteria concentrations. |
| Fluoride** | ○ | ○ | ● | ☐ | Reagent is a hazardous waste. Exception for communities that do not fluoridate their tap water. |
| Hardness | ☐ | ☐ | ☐ | ☐ | |
| pH | ○ | ☐ | ○ | ☐ | |
| Potassium | ☐ | ○ | ○ | ● | May need to use two separate analytical techniques, depending on the concentration. |
| Turbidity | ☐ | ☐ | ○ | ☐ | |

- Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.
- ☐ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter.
- Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water.
- * Data are not available to assess the utility as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and washwater.
- ** Fluoride is a poor indicator when used alone, but can distinguish between washwater and sewage when combined with analysis for detergents, ammonia and potassium.

SOURCE: Modified from *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, Center for Watershed Protection, 2004, p. 122, Table 39.

Table 2-7: NOTIFICATION AND REMOVAL PROCEDURES FOR ILLICIT DISCHARGES

| Financial Responsible Party | Source Identified | Enforcement Authority | Procedure to Follow |
|------------------------------------|--|--|---|
| Exempt 3 rd Party | Any | USEPA (or) MDEP | <ul style="list-style-type: none"> • Notify exempt third party and USEPA or MDEP of Illicit Discharge |
| Private Property Owner | One-Time Illicit Discharge (i.e., spill, dumping, etc.) | Ordinance Enforcement Authority (i.e., Code Enforcement Officer) | <ul style="list-style-type: none"> • Contact Owner • Issue Notice of Violation • Issue fine |
| Private Property Owner | Intermittent or Continuous from Legal Connection | Ordinance Enforcement Authority (i.e., Code Enforcement Officer) | <ul style="list-style-type: none"> • Contact Owner • Issue Notice of Violation • Determine schedule for removal • Confirm removal |
| Private Property Owner | Intermittent or Continuous from Illegal Connection or Indirect (i.e., infiltration or failed septic) | Plumbing Inspector | <ul style="list-style-type: none"> • Notify plumbing inspector |
| Municipal | Intermittent or Continuous from Illegal Connection or Indirect (i.e., failed sewer line) | Ordinance Enforcement Authority (i.e., Code Enforcement Officer) | <ul style="list-style-type: none"> • Issue work order • Schedule removal • Remove connection • Confirm removal |

Table 2-8: SIC CODES FOR MSGP INDUSTRIAL ACTIVITIES

| Sector Name | SIC Code Listing |
|--|---|
| Sector A: Timber Products | 2411 Log Storage and Handling (Wet deck storage areas only authorized if no chemical additives are used in the spray water or applied to the logs). 2421 General Sawmills and Planning Mills. 2426 Hardwood Dimension and Flooring Mills. 2429 Special Product Sawmills, Not Elsewhere Classified. 2431–2439 (except 2434) Millwork, Veneer, Plywood, and Structural Wood (see Sector W). 2448, 2449 Wood Containers. 2451, 2452 Wood Buildings and Mobile Homes. 2491 Wood Preserving. 2493 Reconstituted Wood Products. 2499 Wood Products, Not Elsewhere Classified. |
| Sector B: Paper and Allied Products | 2611 Pulp Mills. 2621 Paper Mills. 2631 Paperboard Mills. 2652–2657 Paperboard Containers and Boxes. 2671–2679 Converted Paper and Paperboard Products, Except Containers and Boxes. |
| Sector C: Chemical and Allied Products | 2812–2819 Industrial Inorganic Chemicals. 2821–2824 Plastics Materials and Synthetic Resins, Synthetic Rubber, Cellulosic and Other Manmade Fibers Except Glass. 2833–2836 Medicinal chemicals and botanical products; pharmaceutical preparations; in vitro and in vivo diagnostic substances; biological products, except diagnostic substances. 2841–2844 Soaps, Detergents, and Cleaning Preparations; Perfumes, Cosmetics, and Other Toilet Preparations. 2851 Paints, Varnishes, Lacquers, Enamels, and Allied Products. 2861–2869 Industrial Organic Chemicals. 2873–2879 Agricultural Chemicals. 2873 Facilities that Make Fertilizer Solely from Leather Scraps and Leather Dust. 2891–2899 Miscellaneous Chemical Products. 3952 (limited to list) Inks and Paints, Including China Painting Enamels, India Ink, Drawing Ink, Platinum Paints for Burnt Wood or Leather Work, Paints for China Painting, Artist's Paints and Artist's Watercolors. |
| Sector D: Asphalt Paving and Roofing Materials and Lubricants | 2951, 2952 Asphalt Paving and Roofing Materials. 2992, 2999 Miscellaneous Products of Petroleum and Coal. |
| Sector E: Glass Clay, Cement, Concrete, and Gypsum Products | 3211 Flat Glass. 3221, 3229 Glass and Glassware, Pressed or Blown. 3231 Glass Products Made of Purchased Glass. 3241 Hydraulic Cement. 3251–3259 Structural Clay Products. 3261–3269 Pottery and Related Products. 3271–3275 Concrete, Gypsum and Plaster Products. 3291–3299 Abrasive, Asbestos, and Miscellaneous Nonmetallic Mineral Products. |
| Sector F: Primary Metals | 3312–3317 Steel Works, Blast Furnaces, and Rolling and Finishing Mills. 3321–3325 Iron and Steel Foundries. 3331–3339 Primary Smelting and Refining of Nonferrous Metals. 3341 Secondary Smelting and Refining of Nonferrous Metals. 3351–3357 Rolling, Drawing, and Extruding of Nonferrous Metals. 3363–3369 Nonferrous Foundries (Castings). 3398, 3399 Miscellaneous Primary Metal Products. |
| Sector G: Metal Mining (Ore Mining and Dressing) | 1011 Iron Ores. 1021 Copper Ores. 1031 Lead and Zinc Ores. 1041, 1044 Gold and Silver Ores. 1061 Ferroalloy Ores, Except Vanadium. 1081 Metal Mining Services. 1094, 1099 Miscellaneous Metal Ores. |

Table 2-8: SIC CODES FOR MSGP INDUSTRIAL ACTIVITIES (continued)

| Sector Name | SIC Code Listing |
|---|--|
| Sector H: Coal Mines and Coal Mining Related Facilities | 1221-1241 Coal Mines and Coal Mining-Related Facilities. |
| Sector I: Oil and Gas Extraction and Refining | 1311 Crude Petroleum and Natural Gas. 1321 Natural Gas Liquids. 1381-1389 Oil and Gas Field Services. 2911 Petroleum Refineries. |
| Sector J: Mineral Mining and Dressing | 1411 Dimension Stone. 1422-1429 Crushed and Broken Stone, Including Rip Rap. 1442, 1446 Sand and Gravel. 1455, 1459 Clay, Ceramic, and Refractory Materials. 1474-1479 Chemical and Fertilizer Mineral Mining. 1481 Nonmetallic Minerals Services, Except Fuels. 1499 Miscellaneous Nonmetallic Minerals, Except Fuels. |
| Sector K: Hazardous Waste Treatment, Storage, or Disposal Facilities | HZ Hazardous Waste Treatment Storage or Disposal. |
| Sector L: Landfills and Land Application Sites | LF Landfills, Land Application Sites, and Open Dumps. |
| Sector M: Automobile Salvage Yards | 5015 Automobile Salvage Yards. |
| Sector N: Scrap Recycling Facilities | 5093 Scrap Recycling Facilities. |
| Sector O: Steam Electric Generating Facilities | SE Steam Electric Generating Facilities. |
| Sector P: Land Transportation and Warehousing | 4011, 4013 Railroad Transportation. 4111-4173 Local and Highway Passenger Transportation. 4212-4231 Motor Freight Transportation and Warehousing. 4311 United States Postal Service. 5171 Petroleum Bulk Stations and Terminals. |
| Sector Q: Water Transportation | 4412-4499 Water Transportation. |
| Sector R: Ship and Boat Building or Repairing Yards | 3731,3732 Ship and Boat Building or Repairing Yards. |
| Sector S: Air Transportation | 4512-4581 Air Transportation Facilities. |
| Sector T: Treatment Works | TW Treatment Works. |
| Sector U: Food and Kindred Products | 2011-2015 Meat Products. 2021-2026 Dairy Products. 2032 Canned, Frozen and Preserved Fruits, Vegetables and Food Specialties. 2041-2048 Grain Mill Products. 2051-2053 Bakery Products. 2061-2068 Sugar and Confectionery Products. 2074-2079 Fats and Oils. 2082-2087 Beverages. 2091-2099 Miscellaneous Food Preparations and Kindred Products. 2111-2141 Tobacco Products. |
| Sector V: Textile Mills, Apparel, and Other Fabric Product Manufacturing, Leather and Leather Products | 2211-2299 Textile Mill Products. 2311-2399 Apparel and Other Finished Products Made From Fabrics and Similar Materials. 3131-3199 (except 3111) Leather and Leather Products, except Leather Tanning and Finishing (see Sector Z). |

Table 2-8: SIC CODES FOR MSGP INDUSTRIAL ACTIVITIES (continued)

| Sector Name | SIC Code Listing |
|--|--|
| Sector W: Furniture and Fixtures | 2434 Wood Kitchen Cabinets. 2511–2599 Furniture and Fixtures. |
| Sector X: Printing and Publishing | 2711–2796 Printing, Publishing, and Allied Industries. |
| Sector Y: Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries. | 3011 Tires and Inner Tubes. 3021 Rubber and Plastics Footwear. 3052, 3053 Gaskets, Packing, and Sealing Devices and Rubber and Plastics Hose and Belting. 3061, 3069 Fabricated Rubber Products, Not Elsewhere Classified. 3081–3089 Miscellaneous Plastics Products. 3931 Musical Instruments. 3942–3949 Dolls, Toys, Games and Sporting and Athletic Goods. 3951–3955 (except 3952 facilities as specified in Sector C)..... Pens, Pencils, and Other Artists' Materials. 3961, 3965 Costume Jewelry, Costume Novelties, Buttons, and Miscellaneous Notions, Except Precious Metal. 3991–3999 Miscellaneous Manufacturing Industries. |
| Sector Z: Leather Tanning and Finishing | 3111.....Leather Tanning and Finishing. |
| Sector AA: Fabricated Metal Products | 3479.....Coating, Engraving, and Allied Services. 3411–3499 Fabricated Metal Products, Except Machinery and Transportation Equipment and Cutting, Engraving and Allied Services. 3911–3915 Jewelry, Silverware, and Plated Ware. |
| Sector AB: Transportation Equipment, Industrial or Commercial Machinery | 3511–3599 (except 3571–3579) Industrial and Commercial Machinery (except Computer and Office Equipment) (see Sector AC). 3711–3799 (except 3731, 3732) Transportation Equipment (except Ship and Boat Building and Repairing) (see Sector R). |
| Sector AC: Electronic, Electrical, Photographic, and Optical Goods | 3571–3579 Computer and Office Equipment. 3612–3699 Electronic, Electrical Equipment and Components, except Computer Equipment. 3812 Measuring, Analyzing and Controlling Instrument; Photographic and Optical Goods. |
| Sector AD: Non-Classified Facilities | N/A Other storm water discharges designated by the Director as needing a permit (see 40 CFR 122.26(g)(1)(I)) or any facility discharging storm water associated with industrial activity not described by any of Sectors A–AC. Note: Facilities may not elect to be covered under Sector AD. Only the Director may assign a facility to Sector AD. |

Table 2-9: IDDE PROGRAM EVALUATION WORKSHEET

| Priority Areas | List any factors that have changed since initial priority was set | Recommended Change (Circle) | |
|----------------|---|-----------------------------|-------------|
| A | | Leave Priority Same | Re-evaluate |
| B | | Leave Priority Same | Re-evaluate |
| C | | Leave Priority Same | Re-evaluate |
| D | | Leave Priority Same | Re-evaluate |
| E | | Leave Priority Same | Re-evaluate |

| Detection Program | # Mapping Inspections | | # Longer Term Inspections | | # Citizen Complaints | | # Opportunistic Inspections | |
|-------------------|-----------------------|----------|---------------------------|----------|----------------------|----------|-----------------------------|----------|
| Priority Areas | Identified | Resolved | Identified | Resolved | Identified | Resolved | Identified | Resolved |
| A | | | | | | | | |
| B | | | | | | | | |
| C | | | | | | | | |
| D | | | | | | | | |
| E | | | | | | | | |

Comments/Recommended Changes

**Table 3-1
GOOD HOUSEKEEPING/POLLUTION PREVENTION
SOPS/ACTIVITY MATRIX**

| SOP | Vehicle/Equipment Maintenance | Facilities Maintenance | Storm Drain System Maintenance | Construction Activities and Other Land Disturbances |
|--|-------------------------------|------------------------|--------------------------------|---|
| 3.1 Catch Basin Cleaning | | | X | |
| 3.2 Catch Basin Repair | | | X | |
| 3.3 Outfall Repair | | | X | |
| 3.4 Storm Drain System Repair | | | X | |
| 3.5 Sediment and Erosion Control | | X | X | X |
| 3.6 Landscape Design and Management | | X | | X |
| 3.7 Lawncare - Fertilizer and Pesticide Storage and Disposal | | X | | X |
| 3.8 Lawncare – Fertilizing and Turf Health | | X | | X |
| 3.9 Lawncare - Weed and Pest Control | | X | | |
| 3.10 Lawncare - Mowing and Watering | X | X | | |
| 3.11 Vehicle and Equipment Storage | X | X | X | X |
| 3.12 Vehicle and Equipment Washing | X | X | | X |
| 3.13 Vehicle Fueling | X | X | | X |
| 3.14 Spill Clean-up | X | X | | X |
| 3.15 Parts Cleaning | X | | | |
| 3.16 Spare Parts Storage | X | X | | |
| 3.17 Alternative Products Use/Storage/Disposal | X | X | | |
| 3.18 Petroleum and Chemical Disposal | X | X | | |
| 3.19 Petroleum and Chemical Handling | X | X | | |
| 3.20 Petroleum and Chemical Storage - Bulk | X | X | | |
| 3.21 Petroleum and Chemical Storage – Small Quantity | X | X | | |
| 3.22 Garbage Storage | X | X | | |
| 3.23 General Facility Housekeeping | X | X | | |
| 3.24 Floor Drains | X | X | | |
| 3.25 Painting | X | X | | |
| 3.26 Street Sweeping | X | X | | X |
| 3.27 Snow Disposal | | X | | |
| 3.28 Sand and Salt Storage | | X | | |
| 3.29 Salt Application | | X | | |

**Table 3-2
VEHICLE/EQUIPMENT MAINTENANCE WORKSHEET**

| Program Category | Available Options (Circle all that apply) |
|---------------------------|--|
| Floor Drains | <pre> graph TD A[Don't Use Floor Drains] --> B[Run a Dry Shop] C[Use Floor Drains] --> D[Discharge to Oil/Water Separator (Sanitary Sewer)] C --> E[Discharge to Holding Tank] D --> F[Maintain] E --> G[Maintain] E --> H[Pump Quarterly or Semi-annually] H --> I[Contractor Name] </pre> |
| Parts Cleaning | <pre> graph TD A[Chlorinated Solvent] --> B[Disposal Contractor's Name] C[Citrus-Based Cleaner] --> D[Discharge to Holding Tank or Oil/Water Separator (sanitary sewer)] E[Steam Clean/Pressure Wash] --> D </pre> |
| Petroleum Storage | <pre> graph TD A["<1,320 gallons"] --> B[Follow Best Management Practices] C["≥ 1,320 gallons"] --> D[SPCC Plan/secondary containment] </pre> |
| Petroleum Disposal | <pre> graph TD A[Recycle with Licensed Transporter] --> B[Retain Records for Three Years] C[Burn on-site] --> D[Analyze for Maine Waste Oil Parameters] D --> E[Retain Records for Three Years] </pre> |
| Vehicle Storage | <pre> graph TD subgraph Pervious_Areas [Pervious Areas] A[Inspect] --> B[Frequency ___] A --> C[Use Drip Pans] C --> D[Provide Drip Pan and Oil Storage] end subgraph Impervious_Areas [Impervious Areas] E[Inspect] --> F[Frequency ___] E --> G[Use Drip Pans] G --> H[Provide Drip Pan and Oil Storage] H --> I[Street Sweep] I --> J[Frequency ___] end </pre> |
| Vehicle Washing | <pre> graph TD A[Storm Drain] --> B[Provide Treatment (if possible)] B --> C[Cold Water Biodegradable/Phosphate-free Soap] D[If Dedicated Area Discharges to:] --> E[Oil/Water Separator & Sanitary Sewer] E --> F[Engine and Undercarriage Washing Allowed] D --> G[If not to Oil/Water Separator & Sanitary Sewer, Not Allowed. Provide treatment (if possible).] </pre> |
| Vehicle Fueling | <pre> graph TD A[Spill Kit Location: _____] --> B[Street Sweep] B --> C[Frequency _____] D[Optional: Provide a canopy over area to minimize runoff/runoff] </pre> |

**Table 3-3
INSPECTION CHECKLIST**

Date: ___/___/___

Inspector: _____

| Inspection Area | Practice Followed | Comments |
|--|----------------------------|----------|
| Check refuse areas for trash on the ground that could contaminate stormwater or be washed away in stormwater | Acceptable/Needs Attention | |
| Check all exterior vehicle and equipment areas for leaks, spills, drips, or excess dirt – Street sweeping necessary? | Acceptable/Needs Attention | |
| Check all exterior vehicle and equipment areas for leaks, spills, drips, or excess dirt – Drip pan use acceptable? | Acceptable/Needs Attention | |
| Check fueling areas for leaks, spills or drips | Acceptable/Needs Attention | |
| Check exterior petroleum storage areas for leaks, spills, or drips | Acceptable/Needs Attention | |
| Clean-up of tracked sand that might allow stormwater transport of sand | Acceptable/Needs Attention | |
| Clean-up tracked salt that might result in stormwater transport | Acceptable/Needs Attention | |
| Check calcium chloride tank for leaks, spills or cracks | Acceptable/Needs Attention | |
| Check vehicle washing area for excess sediment or wastes | Acceptable/Needs Attention | |
| Other: | Acceptable/Needs Attention | |
| Other: | Acceptable/Needs Attention | |

Figure 2-1
LEVEL 6 SUBWATERSHEDS WITHIN THE PORTLAND REGULATED AREA

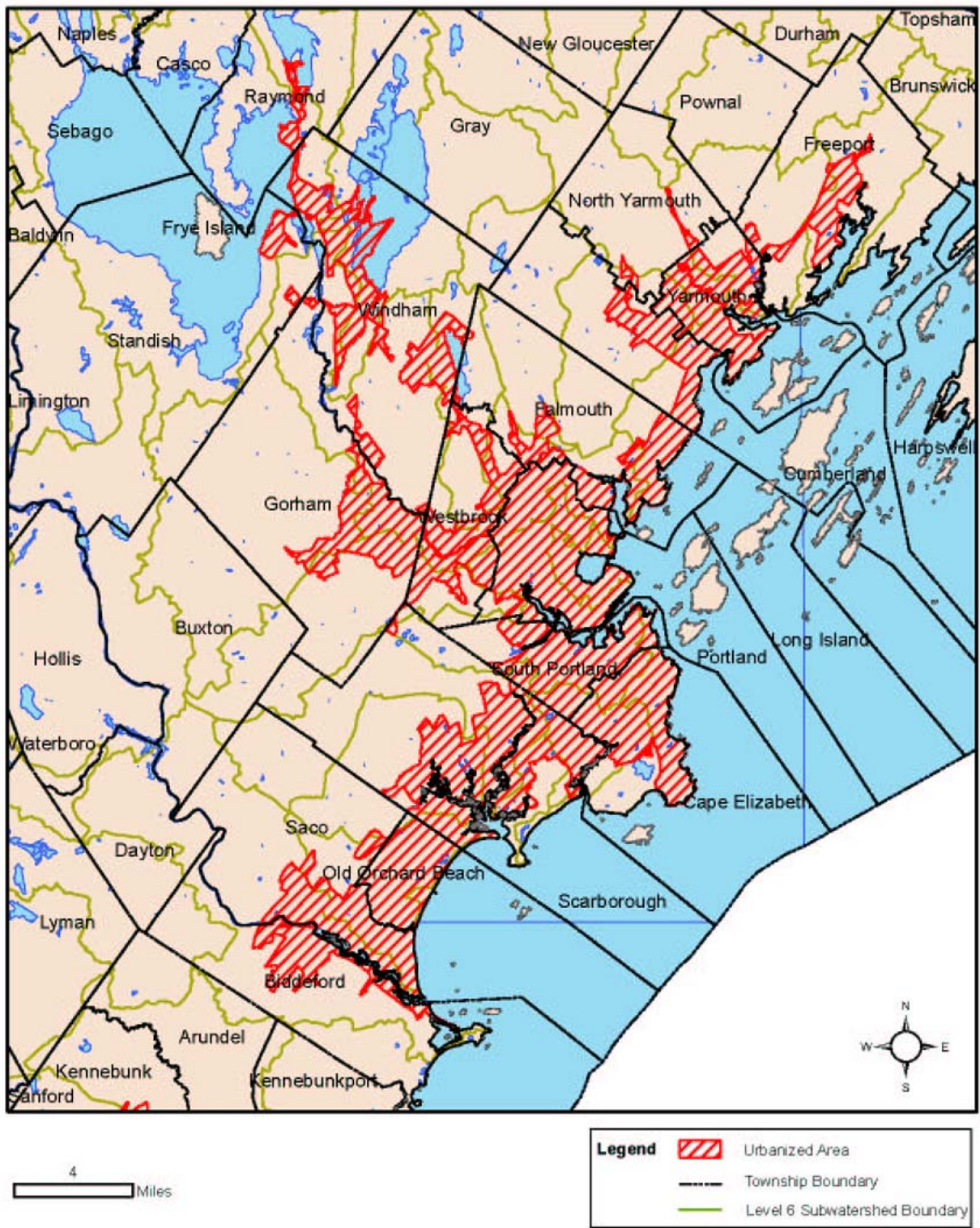
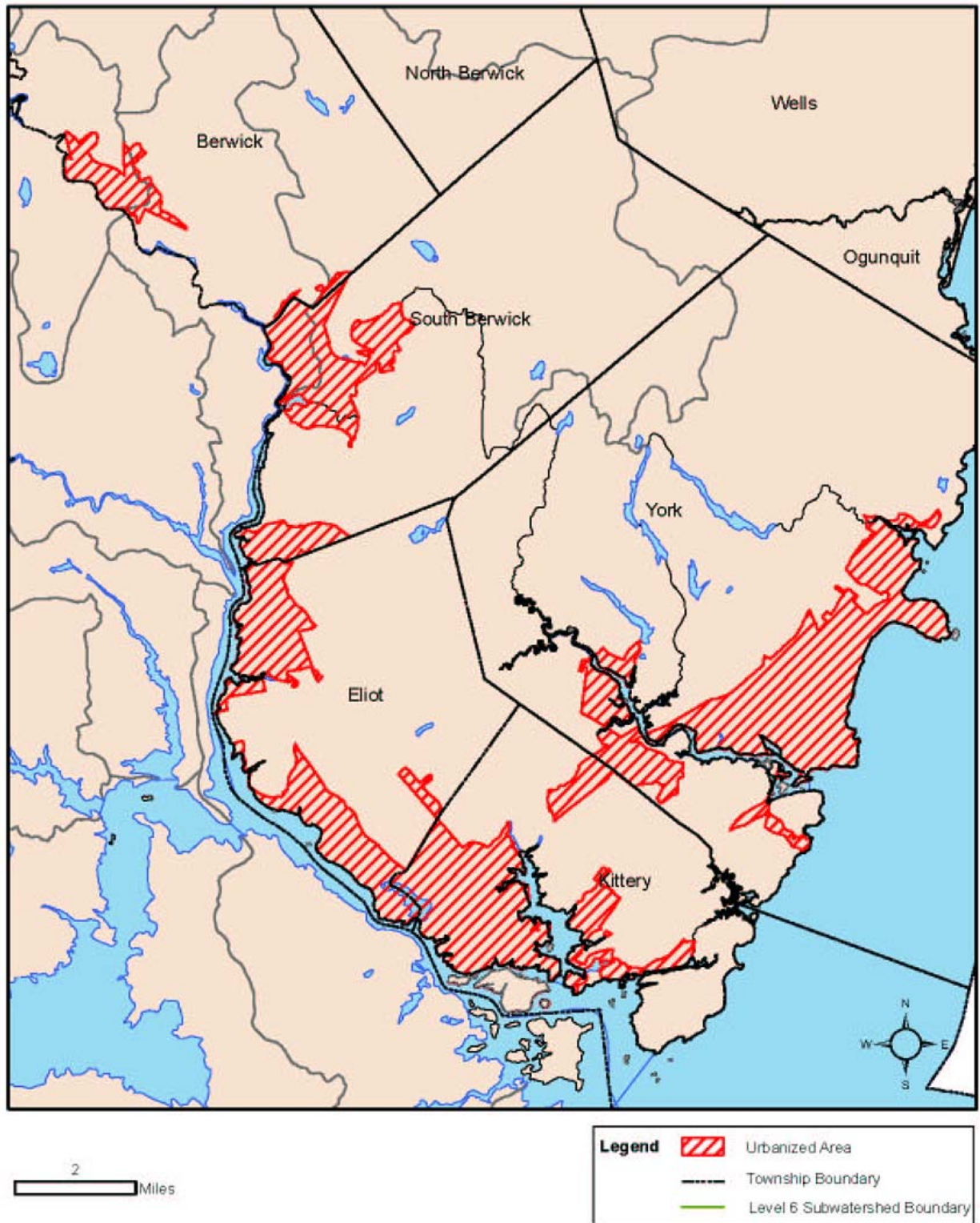
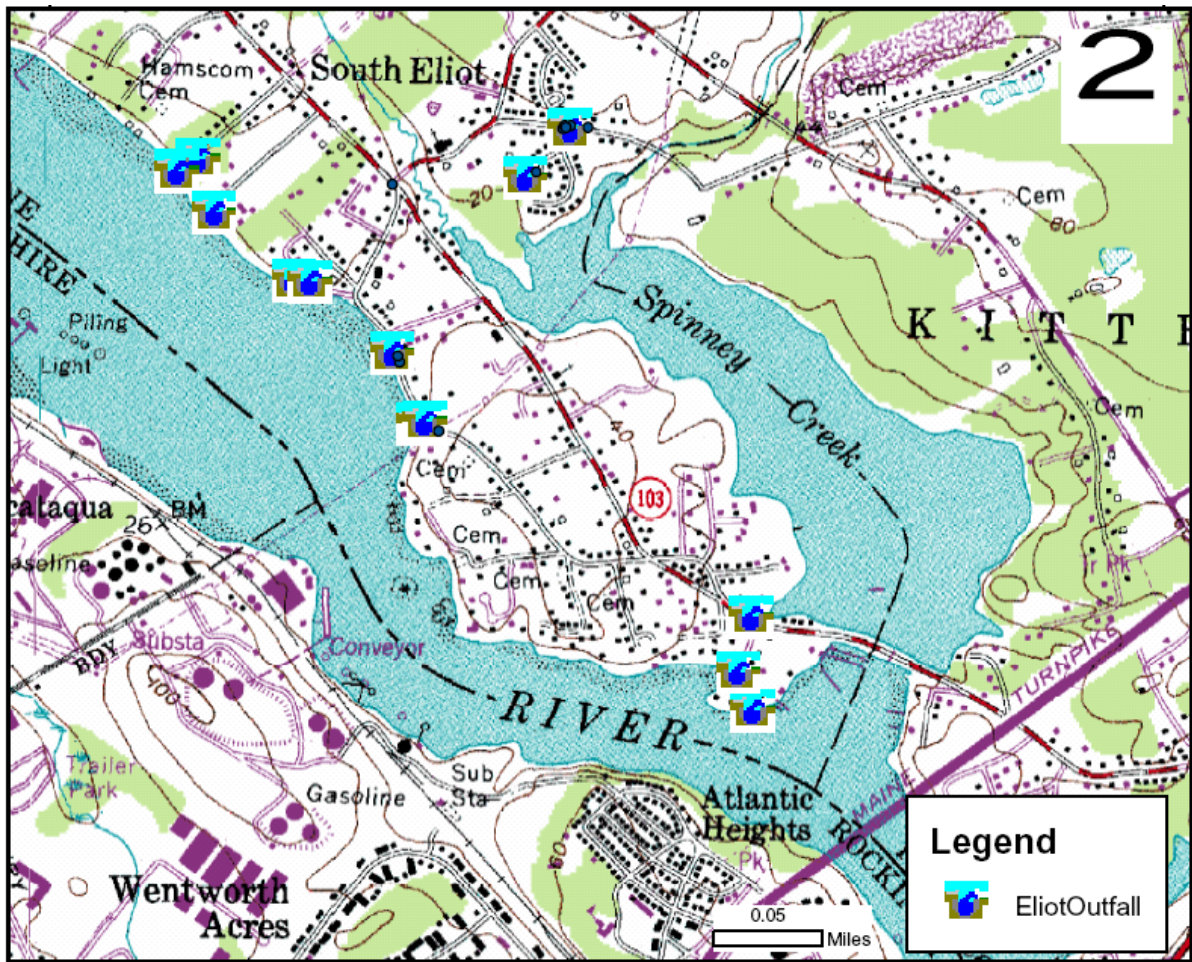


Figure 2-2
LEVEL 6 SUBWATERSHEDS WITHIN THE SOUTHERN MAINE REGULATED
AREA



**Figure 2-3
GIS MAP AND ATTRIBUTE TABLE SOUTH ELIOT STORM DRAIN OUTFALLS**



| FID | Shape* | OUTFALL_ID | Diameter | Material | Date | Sediment | Discharge | Outfall_Co |
|-----|--------|------------|----------|-----------------|------------|----------|-----------|----------------|
| 0 | Point | SWO_001 | 18 | Precast Conc | 12/16/2004 | None | Heavy | Good |
| 1 | Point | SWO_002 | 8 | can't determine | 12/16/2004 | Plugged | None | Poor |
| 2 | Point | SWO_003 | 12 | CMP | 12/16/2004 | 1/2 Full | None | Fair |
| 3 | Point | SWO_004 | 6 | Other | 12/16/2004 | None | None | Good |
| 4 | Point | SWO_005 | 4 | steel | 12/16/2004 | None | Moderate | Good |
| 5 | Point | SWO_006 | 16 | CMP | 12/16/2004 | None | Moderate | Good |
| 6 | Point | SWO_007 | 6 | Other | 12/17/2004 | 1/2 Full | Moderate | Poor |
| 7 | Point | SWO_007A | 100 | Other | 12/17/2004 | | Moderate | |
| 8 | Point | SWO_008 | 8 | CMP | 12/17/2004 | other | None | Poor |
| 9 | Point | SWO_009 | 6 | steel | 12/17/2004 | other | Trickle | Poor |
| 10 | Point | SWO_010 | 4 | Other | 12/17/2004 | None | None | Good |
| 11 | Point | SWO_011 | 6 | can't determine | 12/17/2004 | None | None | Good |
| 12 | Point | SWO_012 | 6 | Other | 12/17/2004 | None | None | Excellent |
| 13 | Point | SWO_013 | 10 | Other | 12/17/2004 | None | Trickle | Good |
| 14 | Point | SWO_014 | 24 | CMP | 12/17/2004 | 1/4 Full | Moderate | Fair |
| 15 | Point | SWO_015 | 6 | steel | 12/17/2004 | None | None | Pipe Corrosion |
| 16 | Point | SWO_016 | 12 | Other | 12/17/2004 | other | Trickle | Good |
| 17 | Point | SWO_017 | 12 | Other | 12/17/2004 | None | None | Excellent |

Figure 2-4
FLOW CHART TO SELECT
TRACING TECHNIQUES

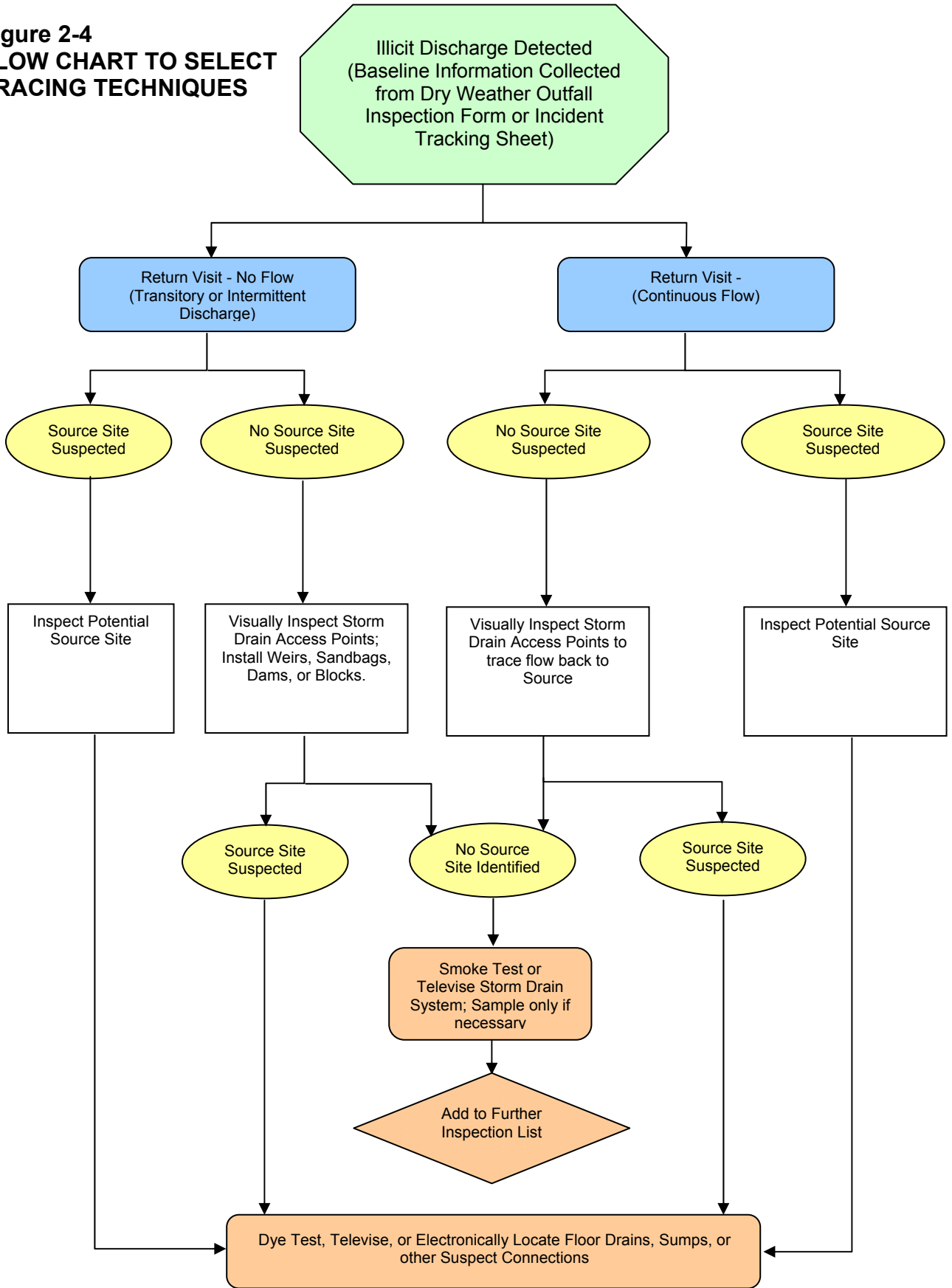
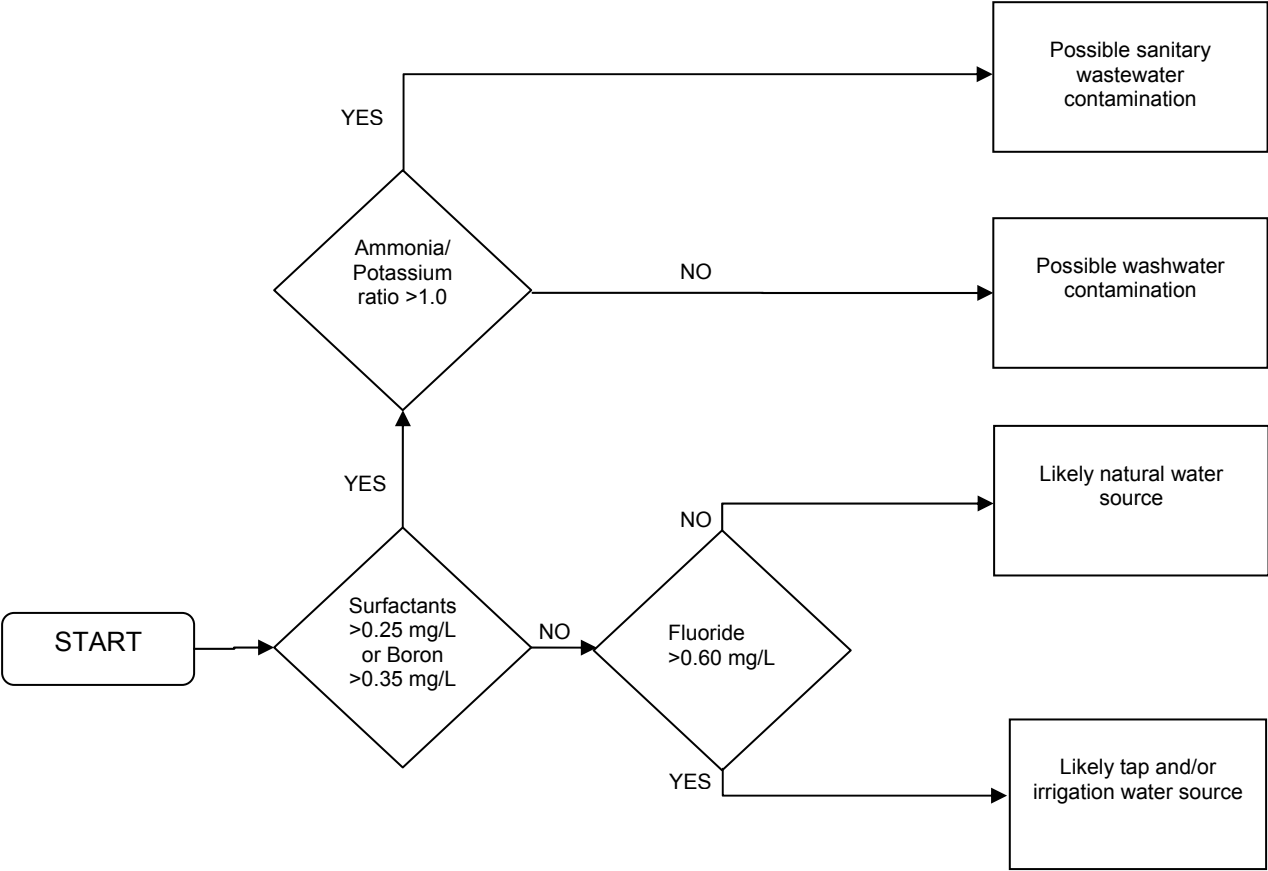


Figure 2-5
FLOW CHART METHOD OF INDICATOR MONITORING



Volume

2

GUIDELINES AND
STANDARD OPERATING PROCEDURES

For Stormwater Phase II Communities in Maine

Standard Operating Procedures and Forms

PREPARED USING FUNDING PROVIDED BY



With additional funding from

City of Auburn
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Town of Freeport
Town of Gorham
Town of Kittery
Town of Old Orchard Beach
Town of Scarborough
Town of South Berwick
Town of Windham
Town of Yarmouth

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1. INTRODUCTION

This section describes the regulatory basis, intended audience, and overall organization of this manual.

1.1 BASIS FOR THE MANUAL

In June 2003, the Maine Department of Environmental Protection (MDEP) issued a General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4s). Twenty-eight communities became subject to Stormwater Phase II regulations based on their designation as Urbanized Areas according to the 2000 US Census. The regulation specifies issuance of a General Permit every five years. The current General Permit, which is valid from June 2003 through June 2008, requires that each regulated community develop a five-year plan to:

“... (R)educe the discharge of pollutants from its regulated small MS4 to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act.”

Fourteen of the regulated communities in the Casco Bay watershed, with assistance from the Casco Bay Estuary Partnership (CBEP), Cumberland County Soil and Water Conservation District (CCSWCD), and others, formed an Interlocal Stormwater Working Group (ISWG) to collaborate on selected requirements of the General Permit. In particular, the ISWG identified the need for a locally-adaptable set of guidelines and standard operating procedures (SOPs) as a top priority to improve the quality of municipal stormwater practices. Six additional communities in southern Maine and central Maine joined with the ISWG to create this manual.

Stormwater accumulates sediments, pathogens, nutrients, toxic chemicals, and other pollutants as it runs off into storm drain systems and out into receiving water bodies, and is possibly the single greatest contributor of contaminants to Casco Bay (CBEP 1995). This non-point source of pollution directly contributes to degraded water quality throughout Maine, and can result in the closure of clam flats and swimming areas as well as degraded habitats within Casco Bay and other coastal areas. CBEP's 1995 *Casco Bay Plan* prioritizes the need to minimize the loading of pathogens, toxics, nutrients, and sediments from stormwater and combined sewer overflows to Casco Bay, as well as the need to reduce loading from non-point sources of pollution.

KEY AREAS

ADDRESSED BY THIS

MANUAL

- Illicit Discharge
Detection and
Elimination
 - Pollution
Prevention and
Good
Housekeeping
for Municipal
Operations
-

This manual seeks to further implement these goals in order to improve water quality throughout the Casco Bay watershed and the other watersheds in Maine. This manual is intended to provide local support to municipal staff in stormwater management efforts, guiding the employees who serve as the front-line in the implementation of the General Permit requirements.

1.2 OBJECTIVES OF THE MANUAL

The specific objectives of this manual are to:

- ◆ Provide a commonly-accepted set of technical standards and guidance on stormwater management measures that will control the quantity and quality of stormwater produced by municipal activities, new development and redevelopment;
- ◆ Assist municipalities in meeting Stormwater Phase II requirements;
- ◆ Encourage the use of targeted best management practices (BMPs) within the watershed with the long-term goal of consistent application by all regulated entities within the watershed;
- ◆ Encourage cost-savings for MS4s through proper and timely maintenance of stormwater systems; and
- ◆ Promote behavior that will improve water quality in the Casco Bay Watershed and other watersheds in Maine.

1.3 CONTENT OF THE MANUAL

The content of the manual is based primarily on selected requirements of the Stormwater Phase II program. Each community's five-year plan must address the following six minimum control measures:

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

This SOP manual addresses components for two of the minimum control measures as follows (the text in italics is language taken directly from the General Permit):

3. Illicit Discharge Detection and Elimination – This manual describes the procedures that should be taken to develop an IDDE program for a small MS4. Development of an IDDE program should be based on the specific needs of each municipality and the watersheds it falls within. Each community will develop its own unique IDDE program. Program Managers should complete the following steps to develop an effective IDDE program: *1. locate priority areas likely to have illicit discharges, 2. map the storm drain system, 3. develop an illicit discharge detection program, 4. develop procedures to trace the source of an illicit discharge, 5. develop procedures to remove a source, and 6. evaluate the IDDE program effectiveness.* This SOP manual provides guidance on how to complete each of these six steps, resulting in an effective IDDE program that fulfills the intent of the General Permit.

6. Pollution Prevention/Good Housekeeping for Municipal Operations – The General Permit requires inclusion of certain Pollution Prevention/Good Housekeeping components as part of the five-year plan, and suggests others. The required components addressed by this manual include development of:
 - a) *An operation and maintenance program that includes a training component for municipal employees and contractors and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations...this program must include employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction, land disturbances, and stormwater system maintenance;*
 - b) *A program to sweep all publicly accepted paved streets and publicly owned paved parking lots at least once a year as soon as possible after snowmelt;*
 - c) *A program to evaluate and if necessary, clean catch basins and other stormwater structures that accumulate sediment at least once a year and dispose of the removed sediments in accordance with current state law; and*
 - d) *A program to evaluate and if necessary prioritize for repairing, retrofitting, or upgrading the conveyance, structures, and outfalls of the regulated small MS4.*

This manual also addresses development of *procedures for properly disposing of waste removed from the separate storm sewers*, which is a suggested component of the Pollution Prevention/Good Housekeeping minimum control measure. Just as for the IDDE Minimum Control Measure (MCM), the General Permit does not specify what the procedures should include. Therefore, each municipality will be developing its own unique program according to community needs and available resources.

1.4 MANUAL AUDIENCE AND ORGANIZATION

The Stormwater Phase II Program requires the development of new programs and training for municipal employees to implement new programs during daily activities. For this reason the manual addresses two distinct audiences: (1) Program Managers,

who will direct the development of new programs, and (2) municipal employees, such as public works personnel, who will implement the programs on a day-to-day basis.

Volume 1 is intended for use by individuals who are responsible for overseeing and implementing the Stormwater Phase II Program (the “Program Manager”). For the purposes of this manual, the Program Manager is typically in a supervisory or managerial position and in a position to train other employees in procedures required by the Stormwater Phase II Program. Chapter 1 provides an introduction and overview of the manual. Chapter 2, *Illicit Discharge Detection and Elimination*, presents procedures for Program Managers to use in identifying high priority areas, tracing illicit discharges, and eliminating illicit discharges. Chapter 3, *Pollution Prevention and Good Housekeeping*, provides general discussions of the many ways that municipal activities such as vehicle and facilities maintenance may adversely affect stormwater, and reviews ways to modify municipal operations to better prevent and reduce stormwater pollution. Chapter 3 guides the Program Manager through decisions they will need to make in developing procedures related to good housekeeping and pollution prevention. Tables, figures, and forms cited within the text are provided at the end of the volume.

Volume 2 is intended for use by “hands-on” municipal employees. Chapter 1 provides an introduction and overview of the manual. Chapter 2 contains Standard Operating Procedures (SOPs) and forms for use in the performance Illicit Discharge Detection and Elimination. Chapter 3 contains SOPs for use during regular work duties. The SOPs, which are designed to be concise and easy to use, are divided into three categories: *Always*, *Whenever Possible*, and *Never*. The SOPs include forms and summary sheets for use during illicit discharge tracing and elimination and routine work activities. Specific training on the SOPs will help to reinforce their importance and encourage implementation.

1.5 COMMON STORMWATER POLLUTANTS, SOURCES AND IMPACTS

Stormwater runoff contains pollutants that can harm human health, degrade water quality and aquatic habitat, and impair ecosystem functions. On its way to streams, estuaries, and other receiving water bodies, stormwater runoff accumulates pollutants such as oil, gas, and other hydrocarbons, heavy metals, deicers, pesticides, fine sediment, fertilizers, and bacteria, all of which can impair water quality. The pollutants of greatest concern in Casco Bay are nitrogen, toxic contaminants such as polycyclic aromatic hydrocarbons (PAHs), and fecal coliform bacteria. Runoff from fertilized lawns contributes excess nutrients to water bodies, which can lead to algal blooms and in extreme cases, fish kill events due to low dissolved oxygen levels. Elevated fecal coliform levels impair water quality and can lead to restrictions on the use and enjoyment of natural resources such as shellfish beds and swimming areas. Other stormwater pollutants of concern are toxic contaminants, such as heavy metals and pesticides, which originate from vehicles and businesses or from homeowner activities.

All of these pollutants can wash into receiving waterbodies during storm events. Understanding the sources of these pollutants and the impacts each pollutant has

can help inform municipal planning and assist in identifying priority goals and objectives when managing stormwater. The following table summarizes common stormwater pollutants, their sources and potential impacts.


Table 1-1. Common Stormwater Pollutants, Sources, and Impacts.

| Pollutant | Sources | Impacts |
|---|--|---|
| Sediment | Construction sites; eroding streambanks and lakeshores; winter sand and salt application; vehicle/boat washing; agricultural sites. | Destruction of plant and fish habitat; transportation of attached oils, nutrients and other pollutants; increased maintenance costs. |
| Nutrients (phosphorus, nitrogen) | Fertilizers; malfunctioning septic systems; livestock, bird & pet waste; vehicle/boat washing; grey water; decaying grass and leaves; sewer overflows; leaking trash containers. | Increased potential for nuisance or toxic algal blooms; increased potential for hypoxia/anoxia (low levels of dissolved oxygen which can kill aquatic organisms). |
| Hydrocarbons (Polycyclic Aromatic Hydrocarbons) | Vehicle and equipment leaks; vehicle and equipment emissions; pesticides; fuel spills; equipment cleaning; improper fuel storage & disposal. | Toxic at low levels. |
| Heavy Metals | Vehicle brake and tire wear; vehicle/equipment exhaust; batteries; galvanized metal; paint and wood preservatives; batteries; fuels; pesticides; cleaners. | Toxic at low levels; drinking water contamination. |
| Pathogens | Livestock, bird and pet wastes; malfunctioning septic systems; sewer overflows. | Risk to human health leading to closure of shellfish areas and swimming areas; drinking water contamination. |
| Toxic Chemicals | Heavy metals; PAHs; pesticides; dioxins; PCBs; from wear, spills, illegal discharges and leaks. | Toxic at low levels. |
| Debris/Litter | Improper waste disposal and storage; fishing gear; leaking rubbish containers; cigarette butts; littering. | Potential risk to human and aquatic life. |

**Table 1-2. GOOD HOUSEKEEPING/POLLUTION PREVENTION
SOPS/ACTIVITY MATRIX**

| SOP | Vehicle/Equipment Maintenance | Facilities Maintenance | Storm Drain System Maintenance | Construction Activities and Other Land Disturbances |
|---|-------------------------------|------------------------|--------------------------------|---|
| 3.1 Catch Basin Cleaning | | | X | |
| 3.2 Catch Basin Repair | | | X | |
| 3.3 Outfall Repair | | | X | |
| 3.4 Storm Drain System Repair | | | X | |
| 3.5 Erosion and Sediment Control | | X | X | X |
| 3.6 Landscape Design and Management | | X | | X |
| 3.7 Lawn care - Fertilizer & Pesticide Storage/Handling | | X | | X |
| 3.8 Lawn care – Fertilizing and Turf Health | | X | | X |
| 3.9 Lawn care - Weed and Pest Control | | X | | |
| 3.10 Lawn care - Mowing and Watering | X | X | | |
| 3.11 Vehicle and Equipment Storage | X | X | X | X |
| 3.12 Vehicle and Equipment Washing | X | X | | X |
| 3.13 Vehicle Fueling | X | X | | X |
| 3.14 Spill Clean-up | X | X | | X |
| 3.15 Parts Cleaning | X | | | |
| 3.16 Spare Parts Storage | X | X | | |
| 3.17 Alternative Products Use/Storage/Disposal | X | X | | |
| 3.18 Petroleum and Chemical Disposal | X | X | | |
| 3.19 Petroleum and Chemical Handling | X | X | | |
| 3.20 Petroleum and Chemical Storage - Bulk | X | X | | |
| 3.21 Petroleum and Chemical Storage – Small Quantity | X | X | | |
| 3.22 Garbage Storage | X | X | | |
| 3.23 General Facility Housekeeping | X | X | | |
| 3.24 Floor Drains | X | X | | |
| 3.25 Painting | X | X | | |
| 3.26 Street Sweeping | X | X | | X |
| 3.27 Snow Disposal | | X | | |
| 3.28 Sand and Salt Storage | | X | | |
| 3.29 Salt Application | | X | | |

**2. ILLICIT DISCHARGE DETECTION AND
ELIMINATION SOP LIST**

| | | |
|---|---|---|
| Standard Operating Procedure for: | |  |
| 2.1 IDDE: Inspections During Mapping | | |
| Purpose of SOP: | To record basic characteristics of individual storm drain outfalls, and evaluate suspect outfalls for illicit discharges. | |

Always:

- Conduct inspections during dry weather periods.
- Characterize and record the outfall's dimensions, shape, and component material.
- Characterize and record observations on basic sensory and physical indicators (e.g., odor, color, oil sheen).
- Follow procedure below if an obvious illicit discharge is encountered (such as raw sewage, paint, etc.).

Dry Weather Discharge

The CWP defines **dry weather** as a 48 hour period with no runoff-producing rainfall. NEIWPCC defines dry weather as a 48-72 hour period with less than 1/10-inch rainfall. Each community should refine the definition of dry weather to suit its specific conditions.

Whenever Possible:

- Photograph the outfall with a digital camera.
- Identify and label the outfall with a unique identifier. For example "SWO-013".
- If dry weather flow is present at the outfall, and the flow does not appear to be an obvious illicit discharge (e.g., flow is clear, odorless, etc.), attempt to identify the source of the flow (intermittent stream etc.), then document the discharge for future comparison.

Equipment list for mapping:


1. Existing paper maps
2. Field sheets
3. Camera (preferable digital)
4. GPS Unit
5. Spray paint (or other marker)
6. Cell phones or hand-held radios
7. Clip boards and pencils
8. First aid kit
9. Flash light or head lamp
10. Surgical gloves
11. Tape measure
12. Temperature probe
13. Waders
14. Watch with a second hand
15. Five 1-liter sample bottles

Never:

- Never put yourself in danger.
- Never enter private property without permission.

Procedures to follow if illicit discharge is detected:

- Call dispatch / supervisor.
- Trace upstream to locate the source.
- Take photos.
- Estimate flow/collect samples if instructed to do so.

| | | |
|--|---|---|
| Standard Operating Procedure for: | |  |
| 2.2 IDDE: Long-Term Inspections | | |
| Purpose of SOP: | Long-term dry weather inspections of outfalls are a primary means of detecting illicit discharges and identifying any necessary maintenance or repairs. | |

Always:

- Perform more frequent inspections on outfalls with suspected illicit discharges and/or high priority areas.
- Conduct inspections during dry weather periods.
- Check the outfall’s dimensions, shape, and component material.
- Characterize and record observations on basic sensory and physical indicators (e.g., odor, color, oil sheen).
- If an obvious illicit discharge is encountered (such as raw sewage, paint, etc.), follow the procedure below.
- Analyze inspection results for trends and evaluate the effectiveness of the IDDE Program.


Whenever Possible:

- Perform inspections of all the outfalls at least once per permit cycle (long term).
- Photograph the outfall with a digital camera.
- Identify and label the outfall with a unique identifier. For example “SWO-013”.
- If dry weather flow is present at the outfall, and the flow does not appear to be an obvious illicit discharge (e.g., flow is clear, odorless, etc.), attempt to identify the source of the flow (intermittent stream, etc.) then document the discharge for future comparison.
- Identify the source of the discharge.

Never:

- Never put yourself in danger.
- Never enter private property without permission.

| |
|---|
| <p>Procedures to follow if illicit discharge is detected:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Call dispatch / supervisor. <input type="checkbox"/> Trace upstream to locate the source. <input type="checkbox"/> Take photos. <input type="checkbox"/> Estimate flow/collect samples if instructed to do so. |
|---|

| | | |
|--|--|---|
| Standard Operating Procedure for: | |  |
| 2.3 IDDE: Opportunistic Inspections | | |
| Purpose of SOP: | To ensure personnel follow proper procedures if they observe illicit discharges while conducting their regular duties. | |

Always:


- Call dispatcher, supervisor, or code enforcement if you see evidence of an illicit discharge.
- Assess the general area of the illicit discharge to see if you can identify its source.

Whenever Possible:

- Use the Incident Tracking Sheet to document observations.
- Take photographs of the illicit discharge.
- Carry a Dry Weather Outfall Inspection Form.

Never:

- Never enter private property without permission.
- Never put yourself in danger.

| | | |
|--|---|---|
| Standard Operating Procedure for: | |  |
| 2.4 IDDE: Citizen Call-in Inspections | | |
| Purpose of SOP: | To collect appropriate information from a citizen reporting a potential illicit discharge to increase the chances of identifying and removing its source. | |

Always:


- Use the Incident Tracking Sheet to collect the appropriate information.
- Document any further action taken.

Whenever Possible:

- Train Dispatch Personnel in the use of the Incident Tracking Sheet.
- Document and review incidents reported by citizens on an annual basis to look for patterns of illicit discharges.

Never:

- Never enter private property without permission.
- Never put yourself in danger.

| | | |
|--|---|---|
| Standard Operating Procedure for: | |  |
| 2.5 IDDE: Septic System Inspections | | |
| Purpose of SOP: | Failed septic systems can adversely impact water quality. Completing septic system inspections in suspect areas can assist in timely correction. | |

Always:


- Use a certified inspector or a licensed site evaluator.
- Survey high risk areas (older areas or areas near lakes or impaired waterbodies).

Whenever Possible:

- Document septic system inspections in a summary report for future reference.

Never:

- Never enter private property without permission.
- Never put yourself in danger.

| | | |
|---|--|---|
| Standard Operating Procedure for: | |  |
| 2.6 IDDE: Tracing Illicit Discharges | | |
| Purpose of SOP: | To efficiently and systematically identify the source of an illicit discharge. | |

Always:

- Review / consider information collected when illicit discharge was initially identified (Incident Tracking Sheet or Dry Weather Outfall Inspection Form).
- Survey the general area / surrounding properties to identify potential sources of the illicit discharge as a first step.
- Trace illicit discharges using the procedures below.

Whenever Possible:

- Use weirs, sandbags, or dams to trap intermittent discharges during dry weather.
- Smoke test or televise the storm drain system to trace high priority, difficult to detect illicit discharges.


Never:

- Never enter private property without permission.
- Never put yourself in danger.

Tracing Procedures

Flowing discharges – use visual tracing and/or dye testing.

Non-flowing discharges – inspect storm drain access points for staining/ residual evidence and/or use dye testing.

| | | |
|--|---|---|
| Standard Operating Procedure for: | |  |
| 2.7 IDDE: Removing Illicit Discharges | | |
| Purpose of SOP: | Proper removal of an illicit discharge will ensure it does not recur. Using legal methods for the removal will minimize the municipality's liability. | |


Always:

- Determine who is financially responsible:
 - Municipality
 - Private property owner
 - Exempt person
- Suspend access to storm drain if an “imminent and substantial danger” exists.
- If the discharge is from an exempt facility (see box below) notify the facility operator and the appropriate enforcement authority.
- Repair/correct cause of discharge if municipality is responsible.

Never:

- Never repair/correct cause of discharge on private property until directed to do so by the appropriate municipal authority (stormwater program manager, etc.)

| Exempt Facility | Alternate Regulation They Are Subject To | Enforcement Authority |
|--|--|--|
| Maine Turnpike Authority and Maine DOT (in selected urbanized areas) | Maine General Permit for the Discharge of Stormwater from MDOT and MTA MS4s | Maine DEP |
| Portsmouth Naval Shipyard, Southern Maine Community College, USM Gorham, Bangor Air National Guard | Maine General Permit for the Discharge of Stormwater from State and Federally Owned MS4s | Maine DEP |
| Industrial Facilities with selected SIC codes (See Table 2-8 for a complete list) | Multi Sector General Permit for Industrial Activities | USEPA (Until October 2005) Maine DEP (After October 2005) |

| | | |
|---|---|---|
| Standard Operating Procedure for: | |  |
| 2.8 IDDE: Tracking / Evaluating Illicit Discharges | | |
| Purpose of SOP: | Taking time to track and evaluate illicit discharge locations and types is necessary for an effective IDDE program. | |

Always:

- Review illicit discharge activities annually to identify patterns, trends, areas of high or low illicit discharge activity and revise inspection procedures accordingly.
- Select a tracking system that fits the municipality:
 - Three ring binder method (small communities)
 - MS4 ASIST Professional Database (medium and large communities)
 - Custom Database (medium and large communities)

Whenever Possible:

- Use a tracking program that can be linked to your mapping data.

Dry Weather Outfall Inspection Form

Location Information

Date: _____ **Inspector:** _____
Time: _____
Outfall ID: _____
Outfall Location: _____
Receiving Waterbody: _____
Photo Taken: Yes No **Photo ID:** _____

Weather: Clear Cloudy **Approximate Temp:** _____ **Wind Present:** Yes No
Precipitation in the past 3 days: No Yes _____ inches

Pipe Flow: None Trickle Steady 1/4 pipe flow or more
Seepage Flow: None Trickle Steady 1/4 pipe flow or more
Color (if flow is present): _____

Inspection Information *Select all that are applicable*

| Obvious Debris/Pollution: | 0 | Odor: | 0 | Water Clarity: | 0 |
|---------------------------|----|---------------|----|----------------|----|
| None | 0 | None/Natural | 0 | Clear | 0 |
| Foam | 3 | Musty | 5 | Cloudy | 5 |
| Floating Green Scum | 8 | Sewage/septic | 10 | Opaque | 10 |
| Oil / Film | 9 | | | | |
| Vegetative Mat | 9 | | | | |
| Sewage Solids | 10 | | | | |
| TOTAL | | TOTAL | | TOTAL | |

GRAND TOTAL SCORE = _____

Additional Information

Sediment Condition: Open 1/4 Full 1/2 Full 3/4 Full Plugged
Structure Condition: Excellent Good Fair Poor
Trash/litter present: Yes No **Yard waste observed:** Yes No
General Comments:

Potential Sources / Actions Taken:

Follow up required: Yes No

Storm Drain Outfall Characteristics Form

Location Information

Date: _____ Inspector: _____

Time: _____

Outfall ID: _____

Outfall Location: _____

Receiving Waterbody: _____

Photo Taken: Yes No Photo ID: _____

Weather Clear Cloudy Approximate Temp: _____ Wind Present: Yes No

Precipitation in the past 3 days: No Yes _____ inches _____

Dry Weather Inspection Form Used: Yes No - No Discharge No - No Dry Weather No - Other

Pipe Flow: None Trickle Steady 1/4 pipe flow or more

Seepage Flow: None Trickle Steady 1/4 pipe flow or more

Outfall Description *Select all that are applicable, fill in as necessary*

Submerged in water- no partially fully _____

Type: RCP CMP Dimension (inches) _____

Open Pipe- PVC HDPE Circular Box

Steel Other _____ Elliptical Other _____

Open Drainage- Concrete Trapezoidal Depth (inches) _____

Earthen Parabolic Top width (inches) _____

Riprap Other _____ Bottom width (inches) _____

Other _____

Additional Information

Sediment Condition: Open 1/4 Full 1/2 Full 3/4 Full Plugged

Structure Condition: Excellent Good Fair Poor

Trash/litter present: Yes No N↑

Yard waste observed: Yes No

General Comments: _____

Actions Taken: _____

Follow-up Required: Yes No

ILLICIT DISCHARGE HOTLINE INCIDENT TRACKING SHEET

Copied with permission from: *Illicit Discharge Detection and Elimination-A Guidance Manual for Program Development and Technical Assessments*, CWP, 2004.

| | | | | |
|---|---|---|--|--|
| Incident ID: | | | | |
| Responder Information | | | | |
| Call taken by: | | | Call date: | |
| Call time: | | | Precipitation (inches) in past 24-48 hrs: | |
| Reporter Information | | | | |
| Incident time: | | | Incident date: | |
| Caller contact information (<i>optional</i>): | | | | |
| Incident Location (<i>complete one or more below</i>) | | | | |
| Latitude and longitude: | | | | |
| Stream address or outfall #: | | | | |
| Closest street address: | | | | |
| Nearby landmark: | | | | |
| Primary Location Description | | Secondary Location Description: | | |
| <input type="checkbox"/> Stream corridor (<i>In or adjacent to stream</i>) | | <input type="checkbox"/> Outfall | <input type="checkbox"/> In-stream flow | <input type="checkbox"/> Along banks |
| <input type="checkbox"/> Upland area (<i>Land not adjacent to stream</i>) | | <input type="checkbox"/> Near storm drain | <input type="checkbox"/> Near other water source (stormwater pond, wetland, etc.): | |
| Narrative description of location: | | | | |
| Upland Problem Indicator Description | | | | |
| <input type="checkbox"/> Dumping | | <input type="checkbox"/> Oil/solvents/chemicals | <input type="checkbox"/> Sewage | |
| <input type="checkbox"/> Wash water, suds, etc. | | <input type="checkbox"/> Other: _____ | | |
| Stream Corridor Problem Indicator Description | | | | |
| Odor | <input type="checkbox"/> None | <input type="checkbox"/> Sewage | <input type="checkbox"/> Rancid/Sour | <input type="checkbox"/> Petroleum (gas) |
| | <input type="checkbox"/> Sulfide (rotten eggs); natural gas | <input type="checkbox"/> Other: Describe in "Narrative" section | | |
| Appearance | <input type="checkbox"/> "Normal" | <input type="checkbox"/> Oil sheen | <input type="checkbox"/> Cloudy | <input type="checkbox"/> Suds |
| | <input type="checkbox"/> Other: Describe in "Narrative" section | | | |
| Floatables | <input type="checkbox"/> None: | <input type="checkbox"/> Sewage (toilet paper, etc) | <input type="checkbox"/> Algae | <input type="checkbox"/> Dead fish |
| | <input type="checkbox"/> Other: Describe in "Narrative" section | | | |
| Narrative description of problem indicators: | | | | |
| Suspected Violator (name, personal or vehicle description, license plate #, address, etc.): | | | | |

---SAMPLE---

NOTICE OF VIOLATION

Town of _____, Maine
Planning and Permitting
Services

Planning~Building~Electrical~Plumbing~Code Enforcement

Address here, Maine 04210
TELEPHONE (207) XXX-XXXX FAX (207) XXX-XXXX

September 1, 2005

Citizen
22 Main Street
Auburn, ME 04210

RE: Tax Map # _____

Dear Citizen:

On August 30, 2004, Geoff Smith, Planning Inspector and I responded to a report of a discharge to the storm drain system on property owned by you at 22 Main Street in Auburn.

We did confirm the presence of _____. This is to confirm the conversation I had with you. You are in the process of _____ and we agreed you would have the correction completed by _____. We discussed you will _____.

This discharge is in violation of the City of Auburn's Non-Stormwater Discharge Ordinance, which is required by the Clean Water Act. Please keep me informed of how the correction is proceeding. Enclosed is a copy of the Ordinance for your review.

If I can be of further assistance please do not hesitate to contact my office. We are open Mondays from 7:00 a.m. to 5:30 p.m. and Tuesday through Friday, from 8:00 a.m. to 4:30 p.m. I can be reached at 333-6600, extension ____.


Sincerely,

Joe Inspector
Code Enforcement Officer

Chapter

3

**3. POLLUTION PREVENTION AND GOOD
HOUSEKEEPING SOPs**

| | | |
|--|--|---|
| Standard Operating Procedure for: | |  |
| 3.1 Catch Basin Cleaning | | |
| Purpose of SOP: | To protect stormwater by maintaining the ability of catch basins to trap sediments, organic matter, and litter. This reduces clogging in the storm drain system as well as the transport of sediments and pollutants into receiving waterbodies. | |


Always:

- Inspect catch basins for structural integrity and evidence of illicit discharges during cleaning.
- Conduct a chemical analysis if sediment is suspected of contamination to determine if the recovered materials meet the EPA criteria for hazardous waste.
- Dispose of catch basin residues properly (Construction Demolition Debris [CDD] Landfill or secure municipal solid waste or special waste landfill). Beneficial use must be licensed by the MDEP unless Total Petroleum Hydrocarbon Analysis is less than 1,000 mg/kg.

Whenever Possible:

- Inspect each catch basin at least annually, during catch basin cleaning.
- Create a checklist for catch basins to help classify which catch basins require maintenance and how often.
- Perform street sweeping on an appropriate schedule to reduce the amount of sediment, debris and organic matter entering the catch basins, which in turn reduces the frequency with which they will need to be cleaned.
- Discharge fluids collected during catch basin cleaning to a sanitary WWTP.

| | |
|----------------------------|--|
| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – General Facility Housekeeping – Street Sweeping – IDDE SOP for Opportunistic Inspections |

| | | |
|--|--|---|
| Standard Operating Procedure for: | |  |
| 3.2 Catch Basin Repair | | |
| Purpose of SOP: | To protect stormwater by inspecting, testing, and replacing or repairing equipment on a regular basis to prevent a failure of stormwater structures. | |

Always:

- Practice preventive maintenance and inspect on a regular schedule for cracks, leaks, and other conditions that could cause breakdowns in the system (this can be done during the cleaning process).
- Repair defective equipment or structures identified during an inspection as soon as possible.
- Document inspections and repairs and maintain complete records in a record-keeping system.
- Educate personnel on preventive maintenance inspections.


Whenever Possible:

- Research and implement new technology that will improve the overall performance of the catch basin.

Never:

- Never allow defective equipment or structures to go unrepaired.

| | |
|----------------------------|-----------------------------|
| Other Related SOPs: | |
| | – Outfall Repair |
| | – Storm Drain System Repair |

| | | |
|--|--|---|
| Standard Operating Procedure for: | |  |
| 3.3 Outfall Repair | | |
| Purpose of SOP: | To protect stormwater by inspecting, testing, and replacing or repairing equipment on a regular basis to prevent a failure of stormwater structures. | |

Always:

- Locate all outfalls in the municipality and create an inspection schedule.
- Practice preventive maintenance and inspect at least one time per year for cracks, leaks, and other conditions that could cause breakdowns in the system.
- Repair defective structures or equipment identified during an inspection as soon as possible.
- Document inspections and repairs and maintain complete records in a record-keeping system.
- Educate personnel on preventive maintenance inspections.


Whenever Possible:

- Research and implement new technology that will improve the overall performance of the outfall.

Never:

- Never allow defective equipment or structures to go unrepaired.

| | |
|----------------------------|---|
| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – Catch Basin Repair – Storm Drain System Repair |

| | | |
|--|---|---|
| Standard Operating Procedure for: | |  |
| 3.4 Storm Drain System Repair | | |
| Purpose of SOP: | To protect stormwater by inspecting, testing, and replacing or repairing equipment on a regular basis to prevent a failure of the storm drain system. | |

Always:

- Create an inspection and cleaning schedule for the municipal storm drain system, including stormwater detention ponds, energy dissipaters and associated structures.
- Practice preventive maintenance and inspect at least one time per year for cracks, leaks, and other conditions that could cause breakdowns in the system.
- Repair defective structures or equipment identified during an inspection as soon as possible.
- Dispose of collected materials according to state, regional and local regulations to avoid negative environmental impacts.
- Document inspections, cleanings and repairs and maintain complete records in a record-keeping system.
- Use appropriate erosion and sediment control practices when performing repairs.


Whenever Possible:

- Research and implement new technology that will improve the overall performance of the storm drain system.
- Perform street sweeping on a regular basis to reduce the amount of sediment, debris and organic matter entering the storm drain system, which in turn reduces the frequency with which the system will need to be cleaned.

Never:

- Never allow defective equipment or structures to go unrepaired.

| | |
|----------------------------|---|
| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – Street Sweeping – Catch Basin Repair – Outfall Repair |

| | | |
|--|--|---|
| Standard Operating Procedure for: | |  |
| 3.5 Erosion and Sediment Control | | |
| Purpose of SOP: | To protect stormwater from pollution by reducing or eliminating pollutant loading from land disturbing activities. | |

Always:

- Use erosion control techniques or devices to stabilize disturbed areas.
- Use effective site planning to avoid sensitive areas.
- Keep land disturbance to a minimum.
- Inspect and maintain erosion control devices.
- Install erosion control devices properly.
- Install erosion control blankets when seeding drainage ways.


Whenever Possible:

- Protect disturbed areas from stormwater runoff by using stabilizers such as mulch.
- Limit construction activities during months with higher runoff rates.
- Assign responsibility for maintaining erosion control devices.
- Reduce the velocity of stormwater runoff.
- Divert clean water away from the disturbed area during construction activities.
- Protect vegetative buffers or create new ones.
- Stabilize soils by mulching and/or seeding when soils are exposed for more than one week during the dry season, and two days during the rainy season.

Never:

- Never divert runoff into a sensitive area.

| | |
|----------------------------|--|
| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – General Facility Housekeeping – Landscaping |

| | | |
|--|--|---|
| Standard Operating Procedure for: | |  |
| 3.6 Landscape Design and Management | | |
| Purpose of SOP: | To protect stormwater by designing and managing landscaping in ways that minimize polluted runoff. | |

Always:

- Design landscaping by taking into account soil types, light, drainage, desired maintenance level and budget.


Whenever Possible:

- Minimize erosion prone steep slopes by using techniques such as terracing.
- Use native plants that are pest resistant. Plant the right plant in the right area.
- Manage water runoff by rerouting gutters away from storm drains and maintaining groundcovers between developed areas and waterways (ditches, swales, shorelines).
- Reduce or eliminate mown lawn in unused areas.
- Convert unused turf to meadow or forest.
- Establish set back distances from pavement, storm drains, and waterbodies. Allow these areas to serve as buffers with disease-resistant plants and minimal mowing.

Never:

- Never develop a landscape design without assessing its impact on water quality.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – General facility housekeeping – Lawncare – Fertilizing – Lawncare – Weed and Pest Control – Lawncare – Mowing and Watering – Alternative Products Use/Storage/Disposal |

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| Standard Operating Procedure for: | |  |
| 3.7 Lawn Care: Fertilizer and Pesticide Storage and Disposal | | |
| Purpose of SOP: | To protect stormwater by properly storing and disposing of fertilizers and pesticides. Because storm drain water is not part of a wastewater treatment system, discharge of these chemicals flows untreated into ponds, lakes, rivers, streams, estuaries and bays. | |

Always:

- Store fertilizers and pesticides in high, dry locations, according to manufacturer’s specifications and applicable regulations.
- Cleanup spills and leaks of pesticides and fertilizers to prevent the chemicals from reaching the storm drain system.
- Clearly label secondary containers.
- Properly dispose of fertilizers and pesticides according to manufacturer’s specifications and applicable regulations.
- Regularly inspect fertilizer and pesticide storage areas for leaks or spills.


Whenever Possible:

- Store pesticides in enclosed areas or in covered impervious containment, preferably in a locked cabinet.
- Order fertilizers and pesticides for delivery as close to time of use as possible to reduce amount stored at facility.
- Order only the amount needed to minimize excess or obsolete materials requiring storage and disposal.
- Use ALL herbicides or pesticides appropriately to minimize the amount of chemicals requiring disposal.
- Dispose of old, unusable or “obsolete” pesticides as in accordance with applicable regulations.

Never:

- Never dispose of fertilizers or pesticides in storm drains.
- Never leave unlabeled or unstable chemicals in uncontrolled locations.

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| Other Related SOPs: |
| <ul style="list-style-type: none"> - General Facility Housekeeping - Landscaping - Alternative Products - Use/Storage/Disposal |

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| Standard Operating Procedure for: | |  |
| 3.8 Lawncare – Fertilizing and Turf Health | | |
| Purpose of SOP: | To protect stormwater by properly storing, applying, and disposing of fertilizers and by maintaining turf health to reduce diseases. | |

Always:

- Apply fertilizers based on a soil testing program, soil type, turf function, and assessment by qualified personnel.
- Store, use, and dispose of all fertilizers and contaminated wastes according to manufacturer’s specifications and applicable regulations.
- Choose seed based on soil types, intended use of area, latest variety research, and assessment of past site performance.

Whenever Possible:

- Avoid fertilizing during a drought or when the soil is dry.
- Apply fertilizers during periods of maximum plant uptake (usually fall and spring).
- Avoid combined products such as weed and feed, which do not necessarily target specific problems at the appropriate time.
- Calibrate application equipment to ensure proper application.
- If phosphorus fertilizer is used when re-seeding, mix phosphorus into root-zone.
- Use natural compost and organic fertilizers instead of synthetic fertilizers.
- Aerate grassed areas to improve drainage and bring more oxygen to the soil.

Never:

- Never fertilize before a heavy rainfall.
- Never apply phosphorus fertilizer on soil surface.
- Never deposit fertilizer in the water, onto the street or into storm drains.
- Never apply fertilizer to frozen ground.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> - General Facility Housekeeping - Landscaping - Alternative Products Use/Storage/Disposal |

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| Standard Operating Procedure for: | |  |
| 3.9 Lawncare – Weed and Pest Control | | |
| Purpose of SOP: | To protect stormwater by properly storing, applying and disposing of herbicides and pesticides. | |

Always:

- Ensure that pesticides are only applied by personnel certified to do so.
- Use, store, and dispose of all chemicals and waste products according to manufacturer’s specifications, the Maine Pesticides Control Board and any local requirements.
- Clean up any spilled chemicals.
- Store pesticide and herbicide-contaminated waste materials in a labeled, designated, covered, and contained area.
- Use pesticides and herbicides only when necessary.
- Rinse equipment only when necessary and use rinse water to dilute next mix as long as application rates are not exceeded.


Whenever Possible:

- Use alternative methods to control weeds and pests such as Integrated Pest Management strategies, biorational insecticides (natural soaps and oils) or biological controls.
- Mix/load pesticides in an area where spills can be contained.
- Pull weeds by hand or mechanically.
- Spot treat affected areas only instead of entire location.
- Apply pest control at the life stage when the pest is most vulnerable.
- Choose the least toxic pesticides and herbicides that still achieve results.
- Tolerate low levels of weeds.
- Allow grass to grow 2.5 to 3 inches high, reduce thatch build up and aerate soils.
- Reduce seed release of weeds by timing cutting at seed set.
- Establish setback distances from pavement, storm drains, and waterbodies; allow these areas to serve as buffers with disease-resistant plants and minimal mowing.

Never:

- Never mix or prepare pesticides or herbicides near storm drains.
- Never apply controlled pesticides or herbicides unless certified to do so.
- Never apply herbicides or pesticides before a heavy rainfall.
- Never discharge rinse water or excess chemicals to storm drain, sewer, or ground surface in excess of labeled rates.

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| Other Related SOPs: | |
| – | General Facility Housekeeping |
| – | Alternative Products Use/Storage Disposal |

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| Standard Operating Procedure for: | |  |
| 3.10 Lawn Care – Mowing and Irrigation | | |
| Purpose of SOP: | To protect stormwater by using proper mowing and watering techniques. Proper mowing and irrigation techniques will reduce organic matter and other pollutants from entering the storm drain system and waterbodies. | |
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Always:

- Mow only as low as needed for the area’s intended use.
- Vary mowing pattern.
- Base irrigation amounts on monitoring for moisture content.
- Water at appropriate times (when no rain is forecasted).
- Manage leaves, clippings, and compost so that runoff does not enter storm drain system or waterbodies.


Whenever Possible:

- Allow areas to go to meadow or field and mow once or twice per year rather than every week.
- Keep mower blades sharpened to avoid damaging grass leaf tissue.
- Mow when the grass is dry to prevent spread of turf diseases.
- Sweep lawn clippings and debris instead of using water.
- Mulch grass clippings using a mulching mower.
- Fill gas tanks in a controlled location.

Never:

- Mow an area just because it always has been mowed.
- Irrigate based on timers/schedules instead of monitoring for moisture content.
- Never dump gas, wastes or contaminated water down storm drains.
- Never refuel or change the mower oil near storm drains.
- Leave mower running in one location.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> - General Facility Housekeeping - Landscaping |

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| Standard Operating Procedure for: | |  |
| 3.11 Vehicle and Equipment Storage | | |
| Purpose of SOP: | To protect stormwater from petroleum products that may drip or leak from vehicles and equipment being stored or from dirt and sediment that accumulate in the storage areas. | |

Always:

- Inspect parking areas for staining/leaks on a schedule established by the appropriate personnel.
- Use drip pans for vehicles that drip a lot (provide a labeled location to empty and store drip pans).
- Address a known leak or drip as soon as possible.


Whenever Possible:

- Store vehicles inside.
- Store vehicles on paved areas if you can street sweep regularly to remove drips/leaks/dirt.
- Perform street sweeping of paved areas on a schedule established by the appropriate personnel, and dispose of street sweepings properly.
- Maintain vehicles to prevent leaks from occurring.
- Perform a pre-trip inspection of vehicle.

Never:

- Never store leaking vehicles over a storm drain.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – Street Sweeping – Spill Cleanup – Petroleum and Chemical Disposal – General Facility Housekeeping |

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| Standard Operating Procedure for: | |  |
| 3.12 Vehicle and Equipment Washing | | |
| Purpose of SOP: | To protect stormwater using proper vehicle and equipment washing techniques, proper washing locations, and proper disposal of wash water. | |

Always:

- Wash vehicles and equipment in a designated area.
- Discharge all wash water containing degreasers, acids, bases, and/or metal brighteners to an on-site treatment facility, the sanitary sewer in accordance with the treatment plant standards, or an approved holding tank. If these are not available, discharge to a vegetated buffer.


Whenever Possible:

- Use a biodegradable, phosphate free soap.
- Use a commercial car wash for light duty vehicles.
- Wash cars on gravel, grass, or other permeable surfaces.
- Educate personnel on proper washing practices.
- Maintain vehicles and equipment to prevent leaks/drips, which would more easily enter wash water.
- Obtain and use drain guards (filter inserts) to catch sediments, petroleum products, etc. that might enter the storm drains as a result of vehicle washing.
- Minimize water and soap use when rinsing or washing vehicles.

Never:

- Never perform engine washing outside or over a storm drain.
- Never wash vehicles over a storm drain or near drinking water wells.

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| Other Related SOPs: | |
| | – General Facility Housekeeping |
| | – Alternative Products Use/Storage/Disposal |

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| Standard Operating Procedure for: | |  |
| 3.13 Vehicle and Equipment Fueling | | |
| Purpose of SOP: | To prevent stormwater contamination originating from vehicle and equipment fueling. | |

Always:

- Fuel carefully to minimize drips to the ground surface.
- Maintain clean fuel dispensing areas using dry cleanup methods.
- Utilize fueling safeguards. Clearly label and tag all valves to reduce human error.
- Train employees and subcontractors on proper fueling methods and spill cleanup techniques.
- Maintain fuel storage tanks in accordance with local, state and federal laws.
- Have absorbent spill cleanup kits and materials available at fueling areas.
- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.


Whenever Possible:

- Install a canopy or roof over aboveground storage tanks.
- Regularly inspect fueling equipment for corrosion and structural failure, cracks in foundations, and physical damage to container systems.
- Use designated fueling areas built upon a level impervious surface (hard cement is best). If paved with asphalt, add a protective coating to create an impervious surface.
- Design fueling areas to minimize stormwater exposure. Prevent run-on and ponding of water, and use secondary containment systems.
- Protect storm drains from fueling areas using berms and dikes.
- Use drip pans or absorbent pads during fueling to collect leaks.
- Add automatic shutoff mechanisms and vapor recovery nozzles to fueling equipment.
- Install protective guards around fueling equipment, tanks, and piping to prevent collisions.

Never:

- “Top off” fuel tanks. Post signs to remind employees.
- Hose down or bury a fuel spill.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – General Facility Housekeeping – Alternative Products Use/Storage/Disposal – Vehicle Maintenance |

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| Standard Operating Procedure for: | |  |
| 3.14 Spill Cleanup | | |
| Purpose of SOP: | To protect stormwater by educating employees on proper spill cleanup procedures, state reporting requirements and preventative actions. | |

Always:

- Stop the source of the spill.
- Contain any liquids.
- Contact the MDEP to report any size spill.
Hazardous Material 1-800-452-4664
Petroleum Products 1-800-482-0777
- Cover the spill with absorbent material such as kitty litter, sawdust, or oil absorbent pads. Do not use straw. Dispose of used absorbent material properly.
- Use water only when necessary and minimize use.
- Contact municipal officials _____ (phone #).
- Develop and maintain a Spill Prevention, Control, and Countermeasure (SPCC) Plan if the facility stores more than 1,320-gallons of petroleum.
- Fit petroleum and chemical storage containers with secondary containment structures.
- Keep a spill kit in areas where petroleum or hazardous materials are stored.
- Train employees in spill response procedures and equipment.
- Deploy containment booms if spill could potentially reach a storm drain or waterbody.
- Position mats to contain drips from equipment or vehicles until they can be repaired.


Whenever Possible:

- Seal the floor with paint to prevent absorption of fluids into concrete.
- Install low-level or low-pressure alarms and/or cut-off systems on hydraulic equipment.

Never:

- Never wash a spill into the storm drain or a water body.
- Never leave a spill without cleaning it up.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – Petroleum and Chemical Handling – Petroleum and Chemical Storage – General Facility Housekeeping – Fertilizer and Pesticide Storage and Disposal |

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| Standard Operating Procedure for: | |  |
| 3.15 Parts Cleaning | | |
| Purpose of SOP: | To protect stormwater by practicing proper parts cleaning techniques and disposing of waste cleaners properly. | |

Always:

- Perform all cleaning in a designated area to minimize the potential for spills.
- Store waste cleaners in properly labeled containers in accordance with regulations.
- Dispose of all waste cleaners properly with a licensed contractor.


Whenever Possible:

- The variety of cleaners should be minimized to make recycling and disposal simpler.
- Use citrus-based cleaners and dispose of properly.
- Use steam cleaning and pressure washing instead of solvents; however wastewater must be discharged to an oil/water separator and the waste water treatment plant notified.

Never:

- Never dispose of spent cleaners down the floor drains, sinks or storm drain inlets.

| Other Related SOPs: | |
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| | – Spill Cleanup |
| | – Alternative Product Use/Storage/Disposal |
| | – Petroleum and Chemical Handling |
| | – Petroleum and Chemical Disposal |
| | – Petroleum and Chemical Storage |

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| Standard Operating Procedure for: | |  |
| 3.16 Spare Parts Storage | | |
| Purpose of SOP: | To protect stormwater by properly storing spare parts. Improper storage of materials can result in pollutants and toxic materials entering ground and surface water supplies. | |


Always:

- Store spare parts in a designated area.
- Use drip pans for any parts that are dripping.

Whenever Possible:

- Store spare parts inside or under cover.
- Monitor storage areas for staining/leaks on a schedule decided on by the appropriate personnel.
- Clean the majority of petroleum products from the parts that are to be stored.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – Street Sweeping – Spill Cleanup – Vehicle and Equipment Storage |

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| Standard Operating Procedure for: | |  |
| 3.17 Alternative Products Use/Storage/Disposal | | |
| Purpose of SOP: | To protect stormwater by using alternative products in an effort to decrease the presence of more toxic products in stormwater. | |


Always:

- Use, store, and dispose of alternative products according to manufacturer’s specifications.

Whenever Possible:

- Use alternative products when deemed appropriate:
 - Instead of solvent-based parts cleaners use citrus-based cleaners or steam/pressure wash to an oil/water separator.
 - Instead of herbicides use bark mulch.
 - Instead of fertilizer use compost or manure.
 - Instead of pesticides plant marigolds, onion, or garlic as deterrents; release or attract beneficial insects.
- Train employees on the benefits of using alternative products.
- Minimize waste by purchasing recyclable products that have minimal packaging.
- Use less harmful deicers such as calcium magnesium acetate, potassium acetate, or organic deicers such as Magic Salt™.
- Use a "pre-mix" of 4 to 1 sodium chloride and calcium chloride, which is the most cost-effective alternative to straight salt.
- Substitute synthetic fertilizers with natural compost and organic fertilizers to improve soil pH, texture and fertility, and cause less leaching to groundwater.
 - Use no-phosphorus lawn fertilizer (phosphorus is rarely lacking in Maine soils).
 - Use natural or certified organic fertilizers with low phosphorus levels (8-2-4, 6-2-4, 9-1-1, 6-1-1).
- Use slow-release nitrogen fertilizers.
- Reduce or eliminate mown lawn in areas that are not actively used.
- Consider converting unused turf to meadow or forest.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – General Facility Housekeeping – Lawncare - Fertilizing – Lawncare – Weed and Pest Control – Lawncare – Mowing and Watering – Vehicle and Equipment Washing – Parts Cleaning – Salt Application – Petroleum and Chemical Storage – Petroleum and Chemical Handling |

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| Standard Operating Procedure for: | |  |
| 3.18 Petroleum and Chemical Disposal | | |
| Purpose of SOP: | To protect stormwater from petroleum and chemical products due to improper disposal practices. | |

Always:

- Dispose of petroleum/chemicals according to manufacturer's specifications and state and federal regulations.
- Maintain tracking of chemicals and petroleum products being disposed off-site.
- Store waste petroleum/chemical products in a designated area labeled as such.
- Label each waste container with its contents.
- Transport used petroleum and chemical products with a licensed transporter and maintain records for three years.
- Train employees on proper disposal practices.
- Drain used oil filters for 24-hours before disposal (disposal in regular trash allowed).
- Inspect waste storage areas for staining/leaks on a regular basis.


Whenever Possible:

- Minimize the number of solvents used to reduce the variety of waste generated and to make recycling easier.
- Use safer alternatives. (see Alternative Products SOP)
- If burning used oil for on-site heat, analyze for Maine Waste Oil parameters (Arsenic, Lead, Cadmium, Chromium, F- listed Halogens, Flashpoint, PCBs) approximately once every 1,000 gallons.

Never:

- Never place hazardous waste in solid waste dumpsters.
- Never pour liquid waste down floor drains, sinks or outdoor storm drain inlets.
- Never mix petroleum waste and chemical waste.
- Never dispose of any gasoline-contaminated waste in the regular trash. Dispose of it only as a hazardous waste.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> - General Facility Housekeeping - Spill Cleanup - Alternative Products Use/Storage/ Disposal |

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| Standard Operating Procedure for: | |  |
| 3.19 Petroleum and Chemical Handling | | |
| Purpose of SOP: | To protect stormwater by properly managing petroleum products and chemicals used by municipalities. | |

Always:

- Train employees in hazardous material handling, safety, spill cleanup and reporting on an annual basis.
- Handle petroleum products and chemicals according to manufacturer's specifications.
- Conduct oil changes indoors for equipment that fits indoors.
- Use proper protective equipment.
- Maintain Material Safety Data Sheets (MSDS) for all chemicals used.
- Make MSDS sheets available on materials that require special handling, storage and/or disposal.
- Create a sign-off sheet for employees stating that they know the location of the MSDS(s).


Whenever Possible:

- Assess hazardous material needs to minimize the amount and variety of hazardous material in storage.
- Transfer materials from one container to another indoors in a well ventilated area. Properly label containers.
- Train new employees within six months of hire.

Never:

- Never treat or dispose of hazardous materials unless licensed to do so.
- Never mix petroleum or chemicals unless directed by manufacturer's instructions.

| Other Related SOPs: | |
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| | – Parts Cleaning |
| | – Spill Cleanup |
| | – General Facility Housekeeping |
| | – Alternative Products Use/Storage/Disposal |
| | – Mowing/Trimming |

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| Standard Operating Procedure for: | |  |
| 3.20 Petroleum and Chemical Storage - Bulk | | |
| Purpose of SOP: | To protect stormwater by properly storing bulk petroleum products and chemicals (containers larger than 55 gallons). | |

Always:

- Store materials away from high traffic areas, posted with appropriate signage.
- Store materials according to manufacturer's specifications in approved containers and conditions.
- Be prepared for possible spills by having a spill kit nearby.
- Develop and use a Spill Prevention Control and Countermeasure (SPCC) plan if storing more than 1,320 gallons of petroleum (required).
- Store incompatible hazardous materials in separate areas.
- Inspect storage areas for leaks or drips frequently.
- Store bulk items within secondary containment areas if bulk items are stored outside.
- Conduct annual employee training to reinforce proper storage techniques for petroleum and chemical products.


Whenever Possible:

- Store bulk chemicals and petroleum products inside or under cover.
- Provide secondary containment for interior storage.

Never:

- Never store bulk chemicals or petroleum products near a storm drain.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> - Chemical Handling - Spill Cleanup - General Facility Housekeeping |

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| Standard Operating Procedure for: | |  |
| 3.21 Petroleum and Chemical Storage – Small Quantity | | |
| Purpose of SOP: | To protect stormwater from pollution by properly storing petroleum products or chemicals (containers smaller than 55-gallons). | |


Always:

- Store materials away from high traffic areas.
- Store materials according to manufacturer’s specifications (e.g. in a flammable materials storage cabinet).
- Dispose of unused or waste materials properly.
- Train employees on proper storage procedures for petroleum and chemical products.
- Store materials in their original containers to maintain appropriate labeling.
- Be prepared for spills by having a spill kit nearby.
- Frequently inspect the storage areas for leaks or spills.
- Conduct annual employee training to reinforce proper storage techniques for petroleum and chemical products.

Never:

- Never store petroleum or chemical products near a floor drain or stormwater inlet.

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| Other Related SOPs: | |
| | – Spill Cleanup |
| | – General Facility Housekeeping |

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| Standard Operating Procedure for: | |  |
| 3.22 Garbage Storage | | |
| Purpose of SOP: | To protect stormwater from contamination by properly storing garbage. Garbage and leachate can be transported by stormwater and enter the storm drain system and receiving waterbodies. | |

Always:

- Dispose of hazardous materials according to manufacturer’s specifications and applicable regulations.
- Cover rubbish bins to keep rubbish and leachate in and wind and rain out.


Whenever Possible:

- Store garbage containers beneath a covered structure or inside to prevent contact with stormwater.
- Install berms, curbing or vegetation strips around storage areas to control water entering/leaving storage areas.
- Locate dumpsters on a flat, concrete surface that does not slope or drain directly into the storm drain system.
- Locate dumpsters and trash cans in convenient, easily observable areas.
- Provide properly-labeled recycling bins to reduce the amount of garbage disposed.
- Inspect garbage bins for leaks regularly, and have repairs made immediately by responsible party.
- Keep bins free of improperly discarded trash.
- Provide training to employees to prevent improper disposal of general trash.
- Minimize waste by purchasing recyclable products that have minimal packaging.
- Request/use dumpsters without drain holes.

Never:

- Never place hazardous wastes in a dumpster or trash bin.

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| Other Related SOPs: | |
| | – General Facility Housekeeping |

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| Standard Operating Procedure for: | |  |
| 3.23 General Facility Housekeeping | | |
| Purpose of SOP: | To protect stormwater by maintaining a clean, organized facility. | |


Always:

- Keep a tidy facility.
- Store hazardous materials as specified by the manufacturer.

Whenever Possible:

- Store materials and wastes inside or under cover if outside.
- Substitute less or non-toxic materials for toxic ones.
- Perform a routine cleaning of the facility.
- Inspect facility (interiors, exterior, parking areas, etc.) for stains.
- Conduct regular employee training and public education to reinforce proper housekeeping.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> - Spill Cleanup - Street Sweeping - Alternative Product Use/Storage/Disposal |

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| Standard Operating Procedure for: | |  |
| 3.24 Floor Drains | | |
| Purpose of SOP: | To protect stormwater from pollution caused by discharges of hazardous materials to the subsurface, ground surface, waterway or storm sewer through floor drains. | |

Always:

- Keep a spill kit in the vicinity of the floor drains.
- Obtain and use drain mats to cover floor drains in the event of spills.
- Use floor drains that are connected to a holding tank or to the sanitary sewer via an oil/water separator.


Whenever Possible:

- Register floor drains with the MDEP Underground Injection Control Program – bring them into compliance as needed, or close them out if they are not necessary.
- Minimize water use or run a dry shop.

Never:

- Never dump hazardous materials down the floor drains.
- Never store leaking vehicles over floor drains.
- Never store hazardous or petroleum products in the vicinity of floor drains.
- Never use floor drains if you are unsure of their discharge location.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – Spill Cleanup – Fertilizer and Pesticide Storage and Disposal – Petroleum and Chemical Handling – Petroleum and Chemical Storage – Petroleum and Chemical Disposal |

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| Standard Operating Procedure for: | |  |
| 3.25 Painting | | |
| Purpose of SOP: | To protect stormwater by properly storing, using and disposing of paint and preparation materials. | |

Always:

- Store waste paints, solvent, and rags in covered containers.
- Contact the MDEP to determine if air emission permits are required.
- Perform abrasive blasting and spray painting in accordance with regulations.
- Properly clean, store, and dispose of paint and associated waste materials.
- Train employees on Best Management Practices concerning painting activities, cleanup and disposal.


Whenever Possible:

- Use less toxic paints such as latex or water-based paints.
- Use drop cloths under any painting or preparation activity such as scraping or sandblasting.
- Use techniques such as brushing and rolling to avoid overspray.
- Use vacuum sanders to collect paint dust.
- Perform abrasive blasting and spray painting in an enclosed or covered area that is safe for personnel.

Never:

- Never dispose of paint or waste paint products into the storm drain system, a waterbody, or onto the ground.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – General Facility Housekeeping – Petroleum and Chemical Storage, Small Quantity – Alternative Products Use/Storage/Disposal |

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| Standard Operating Procedure for: | |  |
| 3.26 Street Sweeping | | |
| Purpose of SOP: | To remove sediment, debris and other pollutants from streets, parking areas, and paved surfaces through regular, properly timed sweeping schedules. | |

Always:

- Dispose of sweeping residual properly (reuse is unrestricted if evidence of litter and visual petroleum contamination is absent).
- Sweep in a pattern that prevents materials from being pushed into storm drains/catch basin inlets.
- Sweep all publicly accepted paved streets and parking lots at least once per year as soon as possible after snowmelt.


Whenever Possible:

- Perform additional sweeping on a seasonal schedule.
- Sweep in locations that generate debris, such as construction entrances, sand/salt loading areas, vehicle fueling areas, vehicle equipment, and s **3-25** as or on an as needed basis.
- Street sweep before a major rain event.
- Use dry vacuum assisted street sweepers (the most effective).
- Maintain street sweeping equipment for maximum effectiveness.
- Locate storage and disposal areas and manage street sweeping waste so that wastes cannot be transported into storm drain systems, waterbodies or wetlands.

Never:

- Never store street sweeping residuals in areas where stormwater could transport fines to the storm drain system or a waterbody.

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| Other Related SOPs: | |
| | – Vehicle and Equipment Storage |
| | – Sand and Salt Storage |

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| Standard Operating Procedure for: | |  |
| 3.27 Road Maintenance – Snow Disposal | | |
| Purpose of SOP: | To protect stormwater by minimizing the impact of snow piles which contain sand, salt, and trash and which generate concentrated releases of pollutants during spring snowmelt conditions. | |

Always:

- Identify sensitive ecosystems prior to disposal and avoid snow disposal in these areas.
- Obtain a Waste Discharge License from MDEP if snow storage is near wetlands, aquifer recharge areas, ponds, streams, or tidal and river areas.
- Remove trash/waste from snow dump areas as soon as possible after snow melt.


Whenever Possible:

- Select storage locations that do not drain into surface waters and where environmental impacts of spring melt are minimal.
- Store snow on areas that are well above the groundwater table on a flat, vegetated slope.
- Avoid disposal on pavement, concrete, and other impervious surfaces.
- Do not pile snow in wooded areas, around trees or in vegetative buffers.
- Divert run-on of water from areas outside the snow piles.
- Manage remaining materials after snowmelt by containing and cleaning up the sediment, sand, and debris.
- Have the MDEP review your snow storage/disposal location(s).

Never:

- Never dispose of snow in wetlands, lakes, streams, rivers, shellfish beds, mudflats, or near drinking water sources.

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| Other Related SOPs: | |
| | – General Facility Housekeeping |
| | – Sand and Salt Storage |

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| Standard Operating Procedure for: | |  |
| 3.28 Road Maintenance – Sand and Salt Storage | | |
| Purpose of SOP: | To protect stormwater by properly storing deicing materials. Sand, salt and other deicing materials used during winter can be transported by runoff into the storm drain system and eventually into waterbodies if not stored properly. | |

Always:

- Cover sand/salt and salt piles that are situated on impervious surfaces.
- Register all new sand/salt storage areas with the MDEP.

Whenever Possible:

- Contain wash water from trucks used for salting and sanding in a holding tank for disposal or discharge into sanitary sewers.
- Place salt piles in areas not subject to flooding.
- Cover sand/salt and salt piles with a tarp (polyethylene) during non-freezing spring and summer months when storage facilities are not available.
- Contain stormwater runoff from areas where salt is stored by using buffers to diffuse runoff before entering waterbodies.
- Use diversion berms to minimize run-on to storage areas.
- Cleanup “track out” after storm events.
- Have the MDEP review your snow storage/disposal location(s).

Never:

- Never dispose of wash water from sanding and salting trucks into the storm drain system, a waterbody or septic system drain fields.

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| Other Related SOPs: | |
| | <ul style="list-style-type: none"> – General Facility Housekeeping – Street Sweeping – Alternative Products Use/Storage/Disposal |

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|---|---|---|
| Standard Operating Procedure for: | |  |
| 3.29 Road Maintenance – Salt Application | | |
| Purpose of SOP: | To protect stormwater by improving application techniques of salt, sand, and other deicing materials. | |

Always:

- Calibrate sand/salt trucks in accordance with Maine DOT and Salt Institute recommendations.

Whenever Possible:

- Use the minimum amount of salt and sand needed to get the job done.
- Use coarse, clean sand, which is free of fine particles and dust and easier to clean in the spring.
- Train drivers to improve application techniques and reduce losses.
- Establish "low salt and/or sand areas" near sensitive environments. Sand may be detrimental in areas sensitive to sedimentation, such as streams, and salt can impact water supply wells.
- Remove snow manually from driveways and sidewalks.
- Limit toxic metals in specifications for deicers.
- Cleanup road grit as soon as possible.
- Use less harmful deicers such as calcium magnesium acetate, potassium acetate, or organic deicers such as Magic Salt™.
- Consider road temperatures when determining volume of salt to apply.
- Control the rate of spreading by equipping trucks with ground-speed sensors.

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| Other Related SOPs: | |
| | – General Facility Housekeeping |
| | – Alternative Products Use/Storage/Disposal |

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