

1 Illicit Discharge Detection and Elimination

1.1 Introduction and Purpose of Plan

The MS4 permit issued by the EPA to ##Town requires the implementation of an Illicit Discharge Detection and Elimination (IDDE) Program to systematically find and eliminate non-stormwater discharges to the separate storm drain system and to prevent the introduction of new illicit connections and discharges.

This document is an outline of the IDDE Program implemented in ##Town. This document was developed as part of the Community Innovation Challenge Grant awarded in 2014 to the Neponset Valley Stormwater Collaborative. The procedures outlined here were adopted from guidance documents from the Central Massachusetts Regional Stormwater Coalition, the Center for Watershed Protection, New England Interstate Water Pollution Control Commission, the Environmental Protection Agency, and the New Hampshire Estuaries Project as well as from the Boston Water and Sewer Commission's IDDE Plan.

This document will be reviewed and updated on a periodic basis to reflect changes to the IDDE Program in ##Town.

1.2 Acronyms and Definitions

CSO – Combined Sewer Overflow

EPA – Environmental Protection Agency

IDDE – Illicit Discharge Detection and Elimination

Illicit Connection – An illicit connection is any connection to the MS4 that is not authorized and is causing or contributing to an illicit discharge

Illicit Discharge – An illicit discharge is any discharge of pollutants to the MS4 except discharges authorized under a separate NPDES permit that authorize a discharge to the MS4

Interconnection – Any point in ##Town's MS4 system that discharges to another MS4 or other stormwater system not owned and operated by ##Town

MassDEP – Massachusetts Department of Environmental Protection

MS4 – The Municipal Separate Storm Sewer System owned and operated by ##Town

MS4 Permit – The 20XX NPDES Phase II Municipal Separate Storm Sewer System Permit issued by EPA to ##Town

NPDES – National Pollutant Discharge Elimination System

SSO – Sanitary Sewer Overflow

Sanitary Sewer Overflow – A discharge of untreated sanitary wastewater from a municipal sanitary sewer to a waterbody, a storm drain collection system or a building

SWMP – Stormwater Management Program

TMDL – Total Maximum Daily Load

1.3 Legal Authority

Through its [Stormwater Bylaw or other authority] ##Town has established the legal authority to:

- prohibit illicit discharges into the MS4 system
- investigate suspected illicit discharges
- eliminate illicit discharges, including discharges from properties not owned by or controlled by the MS4 that discharge into the MS4 system, and
- implement appropriate enforcement procedures and actions

A copy of the ##Town [Stormwater Bylaw] is included in Attachment 1.

Per the MS4 permit conditions the following non-stormwater discharges are allowable in the MS4: water line flushing, landscape irrigation, diverted stream flows, rising groundwater, uncontaminated ground water infiltration, uncontaminated pumped ground water, discharge from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, street wash waters, residential building wash waters without detergents, and flows from firefighting activities. If ##Town, EPA or MassDEP identifies any of the above listed non-stormwater discharges as a significant contributor of pollutants to the MS4 then the category or individual discharge shall be addressed as an illicit discharge.

1.4 Statement of IDDE Responsibilities

The ##Town Stormwater Bylaw empowers the #Town [Board of Selectmen or Other] to enforce the IDDE provisions of the Bylaw.

The [Board of Selectmen or Other] has delegated day to day management, operation and reporting to ##Town's Relevant Department. There is also coordination required with the Other Departments (ex. Board of Health, Planning) to make the program successful. Key contacts for each of the other departments are as follows:

IDDE Implementation Role	Responsible Authority/Individual
IDDE enforcement authority under Stormwater Bylaw	Board of Selectmen
Overall Supervision of IDDE Program	DPW Director Name and Title Here
Day to Day Supervision of IDDE Program and Reporting	Name and Title of Stormwater Coordinator here
Enforcement authority for SSOs	Sewer and Water Commissioners
Enforcement authority for Septic Systems	Board of Health
Other Roles	Other People

1.5 Sanitary Sewer Overflows

Action is taken to eliminate all dry weather and wet weather Sanitary Sewer Overflows (SSOs) immediately upon discovery. If the SSO cannot be eliminated immediately, interim mitigation measures to minimize the discharge of pollutants to the MS4 and/or the environment are taken, and elimination is completed as soon as possible. Preventative maintenance procedures as well as SSO response procedures can be found in Attachment 2.

EPA and MassDEP are notified of all SSOs by telephone as soon as possible and at a minimum within 24 hours. In addition, immediate notification may be needed to the local Board of Health, to any affected

downstream water supply or swimming/recreation area operators, or via the MassDEP 24 hour hotline when hazardous waste or oil may be involved.

Written notice of all SSOs is provided to EPA and MassDEP within 5 days using the required MassDEP reporting form (see Attachment 3). Copies of the written report will also be forwarded to other relevant parties as indicated on the MassDEP form. Copies of written reports are maintained on file.

##Town also maintains an inventory of all dry weather and wet weather SSOs as a part of this program. The SSO inventory was prepared within 120 days of the effective date of the MS4 Permit and is updated at least annually. A copy is included each year with the MS4 Annual Report submitted to EPA. The inventory is maintained in **##Town's [GIS/spreadsheet/database]**. The inventory reflects all known SSOs which occurred beginning five years before the effective date of the MS4 permit through the present. The following information is collected and logged:

- Location (approximate address or intersection and receiving waterbody, if any)
- Clear statement of whether the discharge entered a surface water or storm drain
- Start and end dates and times of SSO
- Estimated volume
- Description including known or suspected cause
- Date and description of mitigation and corrective actions taken or planned
- Current status of mitigation and corrective measures

1.6 System Mapping

##Town [has completed/will complete] mapping of its stormwater infrastructure within two years of the effective date of the permit. Mapping was completed using **mapping software (ex.: ArcGIS, AutoCad)**. The following elements have been or will be mapped:

- Municipal separate storm drain system
 - outfalls and receiving waters
 - pipes
 - open channel conveyances (swales, ditches, etc)
 - catch basins
 - manholes
 - interconnections with other MS4s
 - municipally-owned stormwater treatment structures (e.g., detention and retention basins, infiltration systems, bioretention areas, water quality swales, gross particle separators, oil/water separators, or other proprietary systems)
- Catchment delineations. A catchment is the area of land that drains to an individual outfall or interconnection.
- Waterbodies identified by name and indication of all use impairments as identified in the state's most current 303(d) list.
- Municipal sanitary sewer system **[required where available]**
- **[Municipal combined sewer system, if applicable]**

In addition to the above required elements, the following recommended elements have been incorporated into **##Town's** system mapping:

- **[Move items from the list below here if they are completed and then delete them below]**

In addition to the above required elements, the following recommended elements will be incorporated into **##Town's** system mapping as funding and manpower allow:

- Storm drain material, size and age
- Sanitary sewer system material, size and age

- Where a municipal sanitary sewer system exists, properties known or suspected to be served by a septic system or other onsite wastewater management facility, especially in high-density urban areas
- Area where the MS4 has been or could be influenced by septic system discharges (e.g., areas with poor soils, or high ground water elevations unsuitable for conventional subsurface disposal systems)
- Seasonal high water table elevations impacting sanitary alignments
- Topography
- Orthophotography
- Alignments, dates and representation of work completed (with legend) of past illicit discharge investigations (e.g., flow isolation, dye testing, CCTV)
- Locations of suspected, confirmed and corrected illicit discharges (with dates and flow estimates)

1.7 Outfall Inventory

##Town [has established / will establish within two years of the effective date of the MS4 permit] an outfall inventory that identifies each outfall and interconnection in the MS4. . The Outfall Inventory maintained as part of ##Town's GIS.

The Outfall Inventory is updated at least annually to reflect results of outfall screening and other inspections. A copy of the current Outfall Inventory is included with each MS4 Annual Report submitted to EPA.

The outfall inventory includes the following information for each outfall and interconnection:

- Unique identifier
- Receiving water
- [Recommended but not required: Mass DEP 303d list stream segment identifier]
- Date of most recent inspection
- Dimensions
- Shape
- Material
- Spatial location (GPS coordinates)
- Physical condition
- Indicators of potential non-stormwater discharges as of the most recent inspection

The information above [has been collected / will be collected within one year of the effective date of the MS4 permit] for all outfalls associated with the ##Town MS4. Information is collected using the methodology outlined in the Central Massachusetts Stormwater Coalition Standard Operating Procedure for Dry Weather Outfall Inspection (see Attachment 4). Data for the Outfall Inventory is gathered during an initial outfall inspection using the ["Outfall Reconnaissance Inventory" form from the Center for Watershed Protection or an equivalent paper or electronic form (see Attachment 5)].

Each outfall will be labeled in the field with its unique identifier within five years of the effective date of the MS4 Permit.

1.8 Assessment and Priority Ranking of Catchments

##Town has mapped MS4 outfalls and interconnections to other stormwater systems and defined the boundaries of the catchment for each outfall or interconnection. Catchments were developed using the MAPC Procedure attached (Attachment 6). These catchments have then been placed into one of the following categories based on screening data, as defined by the MS4 permit:

Excluded – Excluded catchments are those that have no potential for illicit discharges. They are located in undeveloped areas with no dwellings and no sanitary sewers; or serve drainage for athletic fields, parks, or undeveloped green space and associate parking without services; or are cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.

Problem – Problem catchments are those with known or suspected illicit discharges due to past complaints or past screening.

High Priority – High Priority catchments discharge to areas of concern to public health such as beaches, recreational areas, drinking water supplies or shellfish beds. They also include catchments determined to be High Priority from outfall/ interconnection screening results that indicate sewage input, or due to characteristics of the catchment.

Low Priority – Low Priority catchments include those catchments that have been screened and determined to have a low potential for sewage input based on outfall/interconnection screening results and catchment characteristics.

Within each of the above categories (Low Priority, High Priority, Problem, and Excluded) catchments are ranked for priority of investigation. Catchments are investigated in order of priority, starting with Problem and continuing to High and then Low Priority catchments. To rank the catchments in the above categories, **##Town** has utilized the following data:

- Results of outfall screening
- Past discharge complaints and reports
- Poor dry weather receiving water quality
- Density of generating sites
- Age of surrounding development and infrastructure
- Sewer conversion
- Historic combined sewer systems
- Density of aging septic systems
- Culverted streams
- Receiving water that is a drinking water supply, shell fishing area, beach or water used for contact recreation.
- Receiving water that is an impaired water body or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to contain the pollutant identified as the cause of impairment.

For outfalls discharging to stream segments listed as impaired for bacteria or pathogens are prioritized as either High Priority or Problem Catchments.

The catchment ranking is attached to this document and is updated at least once per year based on new information gathered under this program.

1.9 Outfall and Interconnection Screening and Sampling

MS4 outfall and interconnection screening occurs during dry and wet weather. Dry weather screening/sampling is conducted at each of the Town's outfalls and any interconnections to other stormwater systems. If a catchment contains one or more of the System Vulnerability Factors defined below, wet weather screening is completed in addition to the dry weather screening/sampling.

1.9.1 System Vulnerability Factors:

- History of SSOs in the catchment

- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs
- Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints
- Common or twin-invert manholes serving storm drain and sanitary sewer alignments
- Crossings of storm drain and sanitary sewer alignments
- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system
- Sanitary sewer infrastructure defects
- Areas formerly served by combined sewer systems
- Sanitary sewer or storm drain infrastructure greater than 40 years old in medium and densely developed areas
- Widespread code-required septic system upgrades required at property transfers
- History of multiple Board of Health actions addressing widespread septic system failures

1.9.2 *Dry Weather Outfall/Interconnection Screening and Sampling*

Dry weather outfall/interconnection screening takes place when less than 0.1 inches of rainfall has occurred in the previous 24-hr period. The attached dry weather outfall inspection procedure is followed and a [digital/paper] outfall inspection form is filled out.

If flow is observed at the outfall or interconnection manhole during dry weather screening, a sample is taken for analysis (Section 1.9.4 below). If no flow is observed, but there is evidence of dry weather flow such as toilet paper, soap bubbles, or odors of sewage or soap the outfall shall be visited again during dry weather within one week of the initial investigation.

Dry weather screening and sampling [has taken place/will take place within three years of the effective permit date] at every outfall and interconnection in the MS4 except for those serving Excluded or Problem catchments.

1.9.3 *Wet Weather Outfall/Interconnection Screening and Sampling*

Wet weather screening takes place during the months of March to June when groundwater levels are relatively high. Wet weather sampling only proceeds when there is a rainfall event sufficient to produce a stormwater discharge. In general, 0.25 inches of rain in the previous 24 hour period should be observed for wet weather screening to take place. Outfalls and interconnections that require screening during wet weather include any outfall or interconnection for a catchment containing one or more of the System Vulnerability Factors as identified above. The attached (Attachment 7) wet weather outfall inspection procedure is followed and an outfall inspection form is filled out.

In the event that an outfall or interconnection is submerged during dry or wet weather screening the screening and sampling is completed at the first accessible upstream manhole and this is noted on the inspection form.

1.9.4 *Outfall/Interconnection Sample Analysis*

All samples of flow taken during outfall/interconnection screening (dry and wet) are analyzed for ammonia, chlorine, conductivity, salinity, temperature, surfactants and bacteria. For fresh receiving water *E. coli* is quantified, and for saline or brackish receiving water enterococci are quantified. Bacteria are quantified by Lab Name, Location. All other sampling parameters are analyzed using field test kits. Details on using field test kits for water quality analysis can be found in Attachment 8, Water Quality Screening in the Field from the Central Massachusetts Regional Stormwater Coalition. In addition, for any receiving water for which there is an approved TMDL the outfall/interconnection samples must be analyzed for the pollutant identified as the cause of the TMDL.

The results of outfall and interconnection sampling are used to help prioritize the catchments for investigation, according to the following parameters. If a parameter exceeds the following thresholds that catchment is prioritized at the top of the High Priority Catchments category, unless it has already been designated as a Problem Catchment.

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Parameter	Threshold
Ammonia	0.5 mg/L
Surfactants	0.25 mg/L
Bacteria	Greater than water quality criteria of receiving water
Chlorine	Detectable level

1.10 Catchment Investigation Procedure

Catchments are investigated for the presence of illicit discharges according to the following procedure. Catchments are investigated in order of priority, with Problem Catchments investigated first, followed by High Priority and then Low Priority Catchments. Within each category the catchments shall be investigated in the order they are ranked. Work can be ongoing in multiple catchments simultaneously to expedite the process.

1.10.1 Review of Mapping and Plans

Prior to beginning the investigation of a particular catchment, the map and plans for the catchment are reviewed. The locations of storm drain and sanitary sewer pipes and manholes are noted, as well as the outfall or interconnection manhole location and receiving water. Information pertaining to any of the System Vulnerability Factors defined above is noted, prior to the field investigation of the catchment.

Junction manholes and Key junction manholes are defined for each catchment prior to beginning the investigation of a catchment. Junction manholes are defined as manholes that receive flow from two or more MS4 alignments. Key junction manholes represent two or more junction manholes, without compromising the investigation. Junction and Key Junction Manholes are shown in Figure 1.

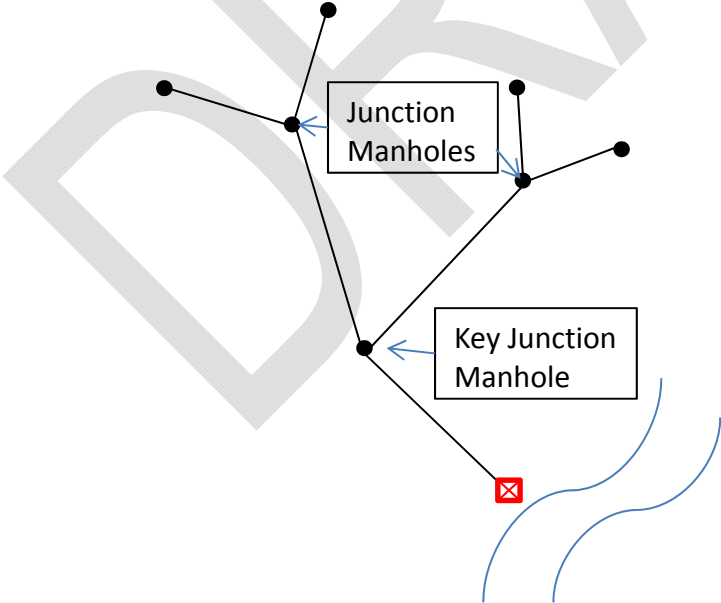


Figure 1: Junction and Key Junction Manholes

1.10.2 Public Notification

Prior to field investigation of manholes and isolation of illicit discharges the public shall be notified of the investigation. Flyers and Door Hangers can be used to notify property owners of the ongoing investigation and of the potential need for access to their property in order to investigate illicit discharge sources.

1.10.3 Storm Drain Cleaning Evaluation

Storm drains should be evaluated for blockages that may impede investigation before beginning field investigation, and removal of known blockages shall be completed prior to the inspection of manholes. If cleaning is not completed prior to the investigation there should be a note made on the manhole inspection form if cleaning is required.

1.10.4 Manhole Inspection Methodology

Manhole investigation begins with the key junction manholes of the catchment, and continues with junction manholes and other manholes to isolate illicit discharges. Manhole inspections are performed starting from the outfall or interconnection and working upstream or starting from the upper parts of the catchment and working downstream, or a combination of both practices. Key junction manholes are inspected in each catchment they exist, regardless of evidence of illicit discharge at the outfall or interconnection.

During the investigation of a catchment storm drain manholes are opened inspected during dry weather (less than 0.1 inches of rain in the preceding 24 hours) to look for evidence of illicit discharges.

During a manhole inspection, the inspector opens the manhole and completes a Manhole Inspection Form (Attachment 9) and notes any visual or olfactory evidence of illicit discharges. Visual evidence may include toilet paper, sanitary products, visible sewage, soap, food, or other indications of anything other than stormwater entering the MS4. Olfactory evidence may include sewage, soap, laundry, bleach, food, or other odors not typical of stormwater.

If flow is observed in storm drain manholes during dry weather the investigator utilizes a field kit to test the flow for the presence of ammonia, chlorine, and surfactants. Also during the inspection of the manhole any observed System Vulnerability Factors listed above are noted. System Vulnerability Factors are tracked for each catchment in the MS4.

If no flow is observed in the manhole during the dry weather investigation, the inlets to the manhole are partially blocked using sand bags or other appropriate material for 48 hours of dry weather. Following 48 hours of dry weather the manholes are re-inspected, and any flow captured behind the dam is tested using the field test kit.

1.10.5 Procedures to isolate and confirm sources of illicit discharges

Following the manhole investigation, procedures are implemented to isolate and confirm sources of illicit discharges. Manholes where evidence of illicit discharges was observed, either visual, olfactory, or test kit, are flagged for further investigation. Upstream and downstream manholes from these flagged manholes are investigated to isolate the source and determine the reach of pipe that is affected. Sandbags are again used to block flow in a manhole to isolate reaches of pipe.

Once a stretch of pipe has been isolated to be the source of the illicit discharge further testing can begin to confirm the source of the illicit discharge. Dye testing of buildings and sanitary sewer pipes, smoke testing, CCTV of pipes, and targeted internal plumbing investigations are used to confirm the source of the illicit discharge.

During the investigation of isolating and confirming the source of illicit discharges downstream work in the catchment must be placed on hold. Once the source of the illicit discharge has been identified and the illicit discharge has been confirmed to be removed downstream work can be continued.

The process of locating the illicit discharge is described in further detail in Attachment 10 "Locating Illicit Discharges" from the Central Massachusetts Stormwater Coalition.

1.11 Illicit Discharge Removal and Confirmation

Once identified, illicit discharges are required to be corrected within sixty days. The following information is collected from each illicit discharge that is removed: location of the discharge and source(s), a description of the discharge, method of discovery, date of discovery, date of elimination, mitigation or enforcement action; and an estimate of the volume of flow removed. ##Town has established sufficient authority for enforcement of removal of illicit discharges through its Stormwater Bylaw.

Following the removal of an illicit discharge, confirmatory screening is performed. Confirmatory screening includes an additional screening of the outfall/interconnection for the catchment where the illicit discharge was removed during dry weather, or dry weather and wet weather if there is one or more System Vulnerability Factor present for the catchment.

1.12 Follow-up Screening

In areas where catchment investigation has been completed (all illicit discharges have been removed and confirmed to be removed) follow-up screening is performed.

Follow-up screening consists of outfall/interconnection screening during dry weather and also during wet weather for catchments with one or more System Vulnerability Factors present. Follow-up screening is performed with the same methodology described in the Outfall and Interconnection Screening and Sampling Section. Follow-up screening is performed within five years of the completion of the catchment investigation and illicit discharge removal and confirmation.

If follow-up screening indicates the presence of illicit discharges in the catchment, the catchment investigation procedure is once again implemented to locate and remove all sources of illicit discharges.

1.13 Illicit Discharge Prevention Procedures

##Town has the following procedures in place to prevent illicit discharges to the MS4:

(List any that are in place and provide description or attachment)

- Spill Response Procedure
- Spill Reporting Procedure
- Spill Identification Procedure
- Spill Containment Procedure
- Public Awareness
- Spill/IDDE Reporting Hotline
- Training of Public Employees – required annually for employees

1.14 Data Tracking and Storage

Data storage and quality control for the IDDE Plan is the responsibility of Name of Responsible Party, Title. Data is stored electronically using Software Type (ex. Microsoft Access, Microsoft Excel) and submitted as part of the annual MS4 report. The location of data collected for reporting on IDDE progress in the annual MS4 report is [file or server location].

The following information is tracked and calculated to measure progress on IDDE investigations in ##Town.

[Recommendations below, adjust as necessary]

- Outfall and interconnection inspection data and sampling results
- Number and percent of outfalls screened
- Manhole inspection data and sampling results

- Number and percent of manholes inspected
- Dye test records – number of dye tests performed and results
- Number and percent of homes dye tested or otherwise inspected
- CCTV inspection records, including linear footage of pipe inspected
- Smoke testing records
- Area of the MS4 that has gone through the Catchment Investigation Procedure
- Number of illicit discharges identified and corrected
- Volume of sewage removed from corrected illicit discharges
- SSOs (see section 1.5 Sanitary Sewer Overflows for more details)
- Cost of illicit discharge removal (total and average per discharge)

1.15 References

Boston Water & Sewer Commission. 2013. Stormwater Management Annual Report. Accessed online at: http://www.bwsc.org/ABOUT_BWSC/systems/stormwater_mgt/2013_Stormwater_Annual_Report.pdf

Brown, E., D. Caraco and R. Pitt. 2004. Illicit Discharge Detection and Elimination: a guidance manual for program development and technical assessments. Center for Watershed Protection and University of Alabama. EPA X-82907801-0.U.S. EPA Office of Wastewater Management, Washington, D.C.

Central Massachusetts Regional Stormwater Coalition. Standard Operating Procedures. Retrieved October 1, 2014, from http://centralmastormwater.org/Pages/crsc_toolbox/SOP

Edwards and Kelcey, November 2006. Guidelines and Standard Operating Procedures: Illicit Discharge Detection and Elimination and pollution prevention/good housekeeping for stormwater phase II communities in New Hampshire. New Hampshire Estuaries Project. Accessed online at: http://water.epa.gov/polwaste/npdes/stormwater/upload/NH_IDDE_SOP.pdf

New England Interstate Water Pollution Control Commission, January 2003. Illicit Discharge Detection and Elimination manual: A handbook for municipalities. NEIWPC. Accessed online at: http://www.neiwpc.org/neiwpc_docs/iddmanual.pdf

USEPA, November 2004. Lower Charles River Illicit Discharge Detection & Elimination (IDDE) Protocol guidance for consideration. USEPA. Accessed online at: <http://water.epa.gov/polwaste/npdes/stormwater/upload/appendxa.pdf>