Illicit Discharge Detection and Elimination (IDDE) Plan

Longmeadow Department of Public Works
170 Dwight Road, Longmeadow, MA 01106

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1 Introduction

1.1 MS4 Program

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

The 2016 Massachusetts MS4 Permit requires that permittee address six Minimum Control Measures (MCMs). These measures include the following:

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

Under Minimum Control Measure 3 (Sec. 2.3.4 of the MS4 Permit), the permittee is required to implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges. The IDDE program must also be recorded in a written (hardcopy or electronic) document. This IDDE Plan has been prepared to address this requirement.

1.2 IDDE Objectives and Timeline

The overall objective of this program is to "systematically find and eliminate" *illicit discharges*[1] to the MS4. The following summarizes the components and framework of the program:

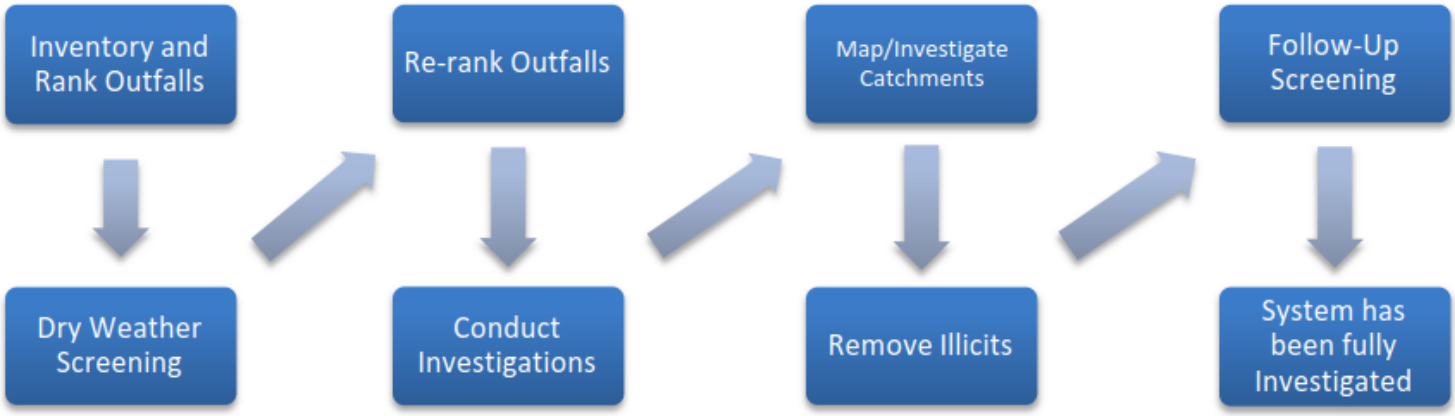
- Identification of legal authority and regulatory mechanism to prohibit illicit discharges and enforce this program;
- An assessment of the current mapping of the MS4 and protocols for improvements to the MS4 mapping;
- Inventory and ranking of outfalls;
- Dry weather outfall screening protocols and procedures;

[1] Per Section 2.3.4.1 of the Permit, an illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of stormwater, except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from firefighting activities.

- Catchment investigations protocols and procedures;
- Methods for identification/confirmation of illicit source(s) and follow-on screening; and
- Employee training.

The IDDE investigation procedure framework shown in Figure 1, from the Central Massachusetts Regional Stormwater Coalition (CMRSWC), will generally be used to guide IDDE investigations work in Longmeadow throughout the permit term.

Figure 1 – IDDE Investigation Procedure Framework

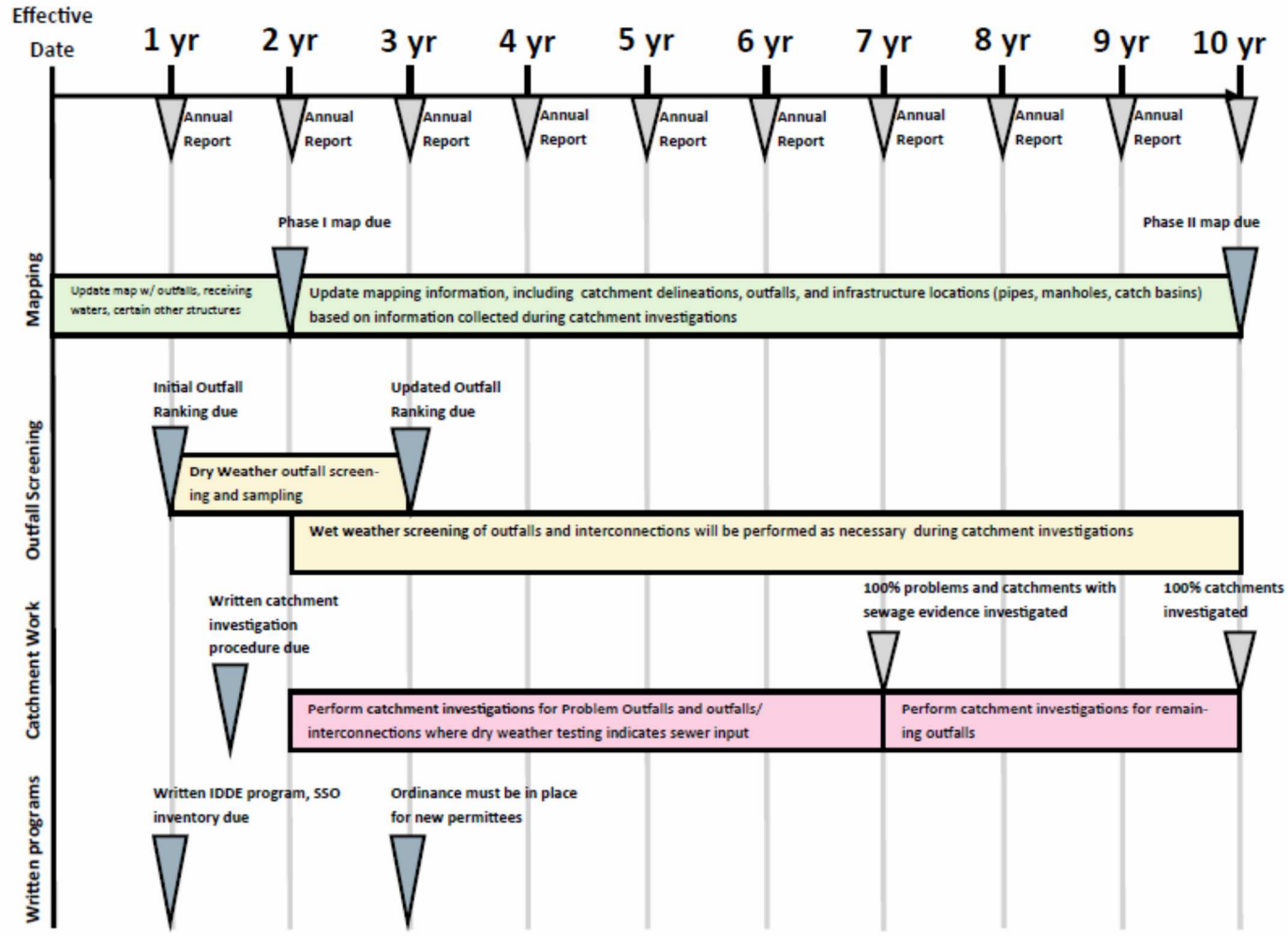


Source: Central Massachusetts Regional Stormwater Coalition IDDE Plan Template, Figure 1-1.

The Illicit Discharge Detection and Elimination Program is also summarized in the Town of Longmeadow's *Stormwater Management Program* (SWMP).

The following illustrates the IDDE implementation timeline as prescribed by the U.S. EPA.

Figure 2 – IDDE Implementation Timeline



Source: EPA Region 1 Stormwater Tools in New England webpage.

It is the Town's intent to adhere to the IDDE timeline requirements of the MS4 permit as graphically shown in Figure 2. Table 1 presents a summary of the IDDE program requirement deadlines for the current permit term.

Table 1 – IDDE Program Timeline

IDDE Requirement	Completion Goal (Permit Year End)
Written IDDE Program Plan, Sanitary Sewer Overflow (SSO) Inventory	Year 1
Phase I Mapping	Year 2
Phase II Mapping	Year 10
Written Catchment Investigation Procedure	Year 2
Dry Weather Outfall Screening	Year 3
Updated Ranking of Outfalls	Year 3
IDDE Regulatory Mechanism or By-law	Year 3
Catchment Investigations – Problem Outfalls	Year 7
Catchment Investigations – Remaining	Year 10

1.3 Illicit Discharges

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

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

Some illicit discharges are intentional, such as dumping used oil (or other pollutant) into catch basins, a resident or contractor illegally tapping a new sewer lateral into a storm drain pipe to avoid the costs of a sewer connection fee and service, and illegal dumping of yard wastes into surface waters.

Some illicit discharges are related to the unsuitability of original infrastructure to the modern regulatory environment. Examples of illicit discharges in this category include connected floor drains in old buildings, as well as sanitary sewer overflows that enter the drainage system. Sump pumps legally connected to the storm drain system may be used inappropriately, such as for the disposal of floor wash water or old household products.

Elimination of some discharges may require substantial costs and efforts, such as funding and designing a project to reconnect sanitary sewer laterals. Others, such as improving self-policing of dog waste management, can be accomplished by outreach in conjunction with the minimal additional cost of dog waste bins and the municipal commitment to disposal of collected materials on a regular basis.

Regardless of the intention, when not addressed, illicit discharges can contribute pollutants, such as heavy metals, toxics, oil, grease, solvents, nutrients, and pathogens to surface waters.

1.4 Allowable Non-Stormwater Discharges

The following categories of non-storm water discharges are allowed under the MS4 Permit and the Town's Stormwater Management Bylaw, unless the Town, USEPA or Massachusetts Department of Environmental Protection (MassDEP) identifies any category or individual discharge of non-stormwater discharge as a significant contributor of pollutants to the MS4:

- Water line flushing
- Flow from potable water source
- Landscape irrigation / lawn watering
- Natural flow from riparian habitats and wetlands;
- Diverted stream flows
- Rising ground water
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) or uncontaminated pumped groundwater
- Water from foundation drains, air conditioning condensation, crawl space pumps, footing drains
- Springs
- Individual resident car washing
- Discharge from de-chlorinated swimming pool water (less than one ppm chlorine) provided the water is allowed to stand for one week prior to draining and the pool is drained in such a way as not to cause a nuisance;
- Street wash waters

Under Town bylaws (Section 6-608), dye testing is allowed provided verbal notification is given to the DPW Director prior to the time of the test.

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

1.5 Surface Waters and Impairments

As described in the Town's written SWMP, there are multiple surface waters within the Town that receive discharges from the MS4. Table 2 lists the "impaired waters" within the boundaries of the Town of Longmeadow based on the *Massachusetts Integrated List of Waters for the Clean Water Act 2018/2020 Reporting Cycle* (draft for public comment). Impaired waters are water bodies that do not meet water quality standards for one or more designated use(s) such as recreation or aquatic habitat.

Table 2 – Impaired Waters

Water Body Name	Segment ID	Category	Impairment(s)	Associated Approved TMDL
Connecticut River	MA34-05	5	Escherichia Coli, PCB in Fish Tissue	
Longmeadow Brook	MA34-21	5	Debris/Trash Escherichia coli, Phosphorous, Turbidity	

Surface waters are separated into the following categories:

- Category 1 – Waters attaining all designated uses
- Category 2 – Waters attaining some uses; other uses not assessed
- Category 3 – No uses assessed
- Category 4a – TMDL completed
- Category 4b – Impairment controlled by alternative pollution control requirements
- Category 4c – Impairment not caused by a pollutant – TMDL not required
- Category 5 – The 303(d) List – "Waters requiring a TMDL

Longmeadow has two Category 3 waters: Cooley Brook and Raspberry Brook. Longmeadow Brook (MA34-21) is a Category 5.

1.6 Work Completed to Date

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

The Town of Longmeadow has completed the following IDDE program activities:

- Developed a map of the stormwater system including catch basins, manholes, pipes, outfalls and receiving waters.
- Adopted a Town Bylaws (1) Governing Discharges to the Municipal Storm Drain System; and (2) Stormwater Management and Land Disturbance.
- Developed procedures for locating illicit discharges (i.e., visual screening of outfalls for dry weather discharges, dye or smoke testing)
- Developed SSO inventory in accordance of permit conditions.
- Completed an "Outfall Inventory and Initial Ranking" (see **Appendix A).**

The Town has on ongoing program of outfall screening and sampling (e.g., dry weather) for updates to ranking and reprioritization.

2 Authority and Statement of IDDE Responsibilities

2.1 Legal Authority

The Town of Longmeadow has adopted the following into its Bylaws:

Article Six – Chapter 600 – Bylaw Governing Discharges to the Municipal Storm Drain System

and

Article Six – Chapter 700 – Stormwater Management and Land Disturbance Bylaw

and

Article Six – Chapter 800 – Bylaw Governing Post-Construction Stormwater Management of new Developments and Redevelopments

The bylaws provide the Town of Longmeadow with adequate legal authority to:

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

The Town of Longmeadow will review its current Stormwater Management and Land Disturbance Bylaw and related land use regulations and policies for consistency with the 2016 MS4 Permit.

2.2 Statement of Responsibilities

The Department of Public Works is the lead municipal agency or department responsible for implementing the IDDE program. Included in the SWMP is a listing of the "Stormwater Management Program Team" by title and including contact names.

3 Stormwater System Mapping

3.1 General

The Town of Longmeadow originally developed mapping of its stormwater system to meet the mapping requirements of the 2003 MS4 Permit. The mapping exists in a Geographic Information System (GIS) database. It is updated as projects occur or as data is collected and migrated to the GIS platform. The mapping can be viewed on the Town GIS website. http://hosting.tighebond.com/LongmeadowMA/index.html?basemap=Base%20Map&level=0&x=-8080993.531257813&y=5168270.911677027&idx=0%2C6%2C41%2C43

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

The 2016 MS4 Permit requires the storm system map to be updated in two phases. DPW is responsible for updating the stormwater system mapping and reports on the progress towards completion of the storm system map in annual reports. Updates to the stormwater mapping will be included in the Town's GIS website.

3.2 Phase 1 Mapping

Phase I mapping must be completed within two (2) years of the effective date of the permit (July 1, 2019) and include the following information:

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

As indicated, the Town is working to update the mapping with elements that were not included or have been added (as part of projects coming on-line).

3.3 Phase 2 Mapping

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

- Outfall spatial location (latitude and longitude with a minimum accuracy of ±-30 feet)
- Pipes, manholes and catch basins
- Refined catchment delineations. Catchment delineations must be updated to reflect information collected during catchment investigations.
- Municipal Sanitary Sewer system (if available)
- Municipal combined sewer system (if applicable).

Longmeadow has completed the following updates to its stormwater mapping to meet the Phase II requirements:

- Outfall spatial location (latitude and longitude with a minimum accuracy of +/-30 feet)
- Pipes, manholes and catch basins
- Municipal Sanitary Sewer system

3.4 Additional Recommended Mapping Elements

Although not a requirement of the 2016 MS4 Permit, the Town of Longmeadow may include the following recommended elements in its storm system mapping:

- Storm sewer material, size (pipe diameter), age
- Sanitary sewer system material, size (pipe diameter), age
- Where a municipal sanitary sewer system exists, properties known or suspected to be served by a septic system, especially in high density urban areas
- Area where the permittee's MS4 has received or could receive flow from septic system discharges
- Seasonal high water table elevations impacting sanitary alignments
- Topography and orthophotography
- Alignments, dates and representation of work completed of past illicit discharge investigations
- Locations of suspected confirmed and corrected illicit discharges with dates and flow estimates.

4 Sanitary Sewer Overflows

4.1 Legal Authority

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

The Town of Longmeadow completed an inventory of SSOs that have discharged to the MS4 within the five (5) years prior to the effective date of the 2016 MS4 Permit, based on review of available documentation. The inventory includes SSOs that occurred during wet or dry weather resulting from inadequate conveyance capacities or where interconnectivity of the storm and sanitary sewer infrastructure allows for transfer of flow between systems. The current inventory of known SSOs in the Town is included in **Appendix B**.

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

The inventory in **Appendix B** will be updated by the DPW annually. The SSO inventory will be included in the annual report, including the status of mitigation and corrective measures to address identified SSOs.

5 Assessment and Priority Ranking of Outfalls

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

5.1 Outfall Catchment Delineations

A catchment is the area that drains to an individual outfall[2] or interconnection[3]. The catchments for MS4 outfalls will be delineated to define contributing areas for investigation of potential sources of illicit discharges. Catchments are typically delineated based on topographic contours and mapped drainage infrastructure, where available. Initial catchment delineations were developed as part of the Phase I mapping, and refined catchment delineations will be completed as part of the Phase II mapping to reflect information collected during catchment investigations.

5.2 Outfall and Interconnection Inventory and Initial Ranking

DPW completed an initial outfall and interconnection inventory and priority ranking to assess illicit discharge potential based on existing information. An updated inventory and ranking will be provided in subsequent years as necessary. Updates will include data collected in connection with dry weather screening and other relevant inspections.

The inventory will identify each outfall and interconnection discharging from the MS4, record its location and condition, and provide a framework for tracking inspections, screenings and other IDDE program activities.

Outfalls and interconnections will be classified into one of the following categories:

1. **Problem Outfalls**: Outfalls and interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall include any outfalls/interconnections where previous screening indicates likely sewer input. Likely sewer input indicators are any of the following:

[2] **Outfall** means a point source as defined by 40 CFR § 122.2 as the point where the municipal separate storm sewer discharges to waters of the United States. An outfall does not include open conveyances connecting two municipal separate storm sewers or pipes, tunnels or other conveyances that connect segments of the same stream or other waters of the United States and that are used to convey waters of the United States. Culverts longer than a simple road crossing shall be included in the inventory unless the permittee can confirm that they are free of any connections and simply convey waters of the United States

[3] **Interconnection** means the point (excluding sheet flow over impervious surfaces) where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is conveyed to waters of the United States or to another storm sewer system and eventually to a water of the United States.

- Olfactory or visual evidence of sewage,
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

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

2. **High Priority Outfalls**: Outfalls and interconnections that have not been classified as Problem Outfalls and that are:
    - Discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds
    - Determined by the Town to be high priority based on the characteristics listed below or other available information.
3. **Low Priority Outfalls**: Outfalls and interconnections determined to have low likelihood for an illicit discharge based on the characteristics listed below or other information and not having the criteria above to indicate it as a High Priority Outfall.

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

Outfalls will be ranked into the above priority categories (except for excluded outfalls, which may be excluded from the IDDE program) based on the following characteristics of the defined initial catchment areas, where information is available. Additional relevant characteristics, including location-specific characteristics, may be considered but must be documented in this IDDE Plan.

1. **Previous screening results** – previous screening/sampling results indicate likely sewer input (see criteria above for Problem Outfalls).

2. **Past discharge complaints** and reports.

3. **Poor receiving water quality** – the following guidelines are recommended to identify waters as having a high illicit discharge potential:
    - Exceeding water quality standards for bacteria
    - Ammonia levels above 0.5 mg/l
    - Surfactants levels greater than or equal to 0.25 mg/l

4. **Density of generating sites** – Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.

5. **Age of development and infrastructure** – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a low illicit discharge potential. (Note, Longmeadow has not industrially zoned areas or operations.)

6. **Sewer conversion** – Contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential.

7. **Surrounding density of aging septic systems** – Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.

8. **Culverted streams** – River or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.

9. **Water quality limited waterbodies** that receive a discharge from the MS4 or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment.

Longmeadow DPW engaged the services of Fuss & O'Neill, Inc. complete an inventory and priority ranking to assess the illicit discharge potential of the mapped outfalls and interconnections within the Town's MS4 regulated area. The outfalls were ranked into one of four priority categories (Problem, High Priority, Low Priority, and Excluded) based on the above-described characteristics of the associated catchment areas. The process and the results are included as **Appendix A** in a memorandum titled "Outfall Inventory and Initial Ranking."

Longmeadow will maintain and update an outfall inventory and priority ranking, as necessary.

6 Dry Weather Outfall Screening and Sampling

Dry weather flow is a common indicator of potential illicit connections. The MS4 Permit requires outfalls/interconnections (excluding Problem and excluded Outfalls) to be inspected for the presence of dry weather flow. DPW is responsible for conducting dry weather outfall screening, generally starting with High Priority outfalls, followed by Low Priority outfalls.

6.1 Weather Conditions

Dry weather outfall screening and sampling may occur when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring. For purposes of determining dry weather conditions, program staff will use precipitation data from Westover Air Base.

6.2 Dry Weather Screening/Sampling Procedures

6.2.1 General Procedures

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

1. Identify outfall(s) to be screened/sampled based on initial outfall inventory and priority ranking.

2. Acquire the necessary staff, mapping, and field equipment (see Table 3 for list of potential field equipment).

3. Conduct the outfall inspection during dry weather:

    - Mark and photograph the outfall.
    - Record the inspection information and outfall characteristics (using paper forms or digital form).
    - Record visual/olfactory evidence of pollutants in flowing outfalls including odor, color, turbidity, and floatable matter (suds, bubbles, excrement, toilet paper or sanitary products). Also observe outfalls for deposits and stains, vegetation, and damage to outfall structures.

4. If flow is observed, sample and test the flow following the procedures described in this IDDE Plan.

5. If no flow is observed, but evidence of illicit flow exists (illicit discharges are often intermittent or transitory), revisit the outfall during dry weather within one week of the initial observation, if practicable, to perform a second dry

weather screening and sample any observed flow. Other techniques can be used to detect intermittent or transitory flows including conducting inspections during evenings or weekends and using sandbags.

6. Input results from screening and sampling into spreadsheet/database. Include pertinent formation in the outfall/interconnection inventory and priority ranking.

7. Include screening data in the annual report.

Table 3 – Field Equipment for Dry Weather Outfall Screening and Sampling

Equipment	Use/Notes
Clipboard	For organization of paperwork and writing surface
Tablets and GIS Collector App	For data gathering and recordation of both dry weather inspection and dry weather sampling
Chain of Custody Forms	For proper handling and control of samples
Pens/Pencils/Permanent Markers	For proper labeling
Nitrile Gloves	To protect the sampler as well as the sample from contamination
Flashlight/headlamp w/batteries	For looking in outfalls or manholes.
Cooler with Ice	For transporting samples to the laboratory
Digital Camera	For documenting field conditions at time of inspection
Personal Protective Equipment (PPE)	Reflective vest, Safety glasses and boots at a minimum
GPS Receiver	For taking spatial location data
Water Quality Sonde	If needed, for sampling conductivity, temperature, pH
Water Quality Meter	Hand held meter, if available, for testing for various water quality parameters such as ammonia, surfactants and chlorine.
Test Kits	Have extra kits on hand to sample more outfalls than are anticipated to be screened in a single day.
Labels	For labeling sample containers.
Sample Containers	Make sure sample containers are clean. Keep extra sample containers available. Make sure there are proper sample containers for what is being sampled for (i.e., bacteria requires sterile containers).
Pry Bar or Pick	For opening catch basins and manholes when necessary
Sandbags	For damming low flows in order to take samples
Small Mallet or Hammer	Helping to free stuck manhole and catch basin covers
Utility Knife	Multiple uses
Measuring Tape	Measuring distances and depth of flow
Safety Cones	Safety
Rubber Boots/Waders	For accessing shallow streams/areas
Sampling Pole/Dipper	For accessing hard to reach outfalls and manholes

The following information is generally recorded during dry weather investigations:

- Field personnel, inspection date and time, weather and temperature
- Time (in hours) since last precipitation event and amount (in inches of precipitation).
- Outfall/Structure ID (possible photo too)
- Outfall type (pipe, box culvert, arch, horizontal elliptical, vertical elliptical)
- Outfall material (reinforced concrete, corrugated metal, PVC, HDPE, stone, brick, earthen, other)
- Opening (size and diameter if round or width and height if not round
- Condition (corrosion, cracks/breaks, spalling, pipe collapsed, pipe crushed, pipe submerged)
- Dry weather flow (indication of flow and flow depth in inches)
- Color, clarity, and odor of flow
- Presence of floatables (trash, oil, suds, scum, leaves) and deposits/stains (oil, rust, sediments)
- Vegetation growth (algae, iron floc)
- Test kit sampling results (if sample is taken)
- Whether or not an Illicit discharge is suspected

6.2.2 Sample Collection and Analyses

If flow is present during a dry weather outfall inspection, a sample will be collected and analyzed for the permit parameters[4] listed in **Table 4**. The general procedure for collection of outfall samples is as follows:

1. Fill out sample information on sample bottles and field sheets.
2. Put on protective gloves (nitrile/latex/other) before sampling.
3. Collect sample with dipper or directly in sample containers. If possible, collect water from the flow directly in the sample bottle. Be careful not to disturb sediments.
4. If using a dipper or other device, adequately rinse the device with distilled water and then in water to be sampled (not for bacteria sampling).

[4] Other potentially useful parameters, although not required by the MS4 Permit, include fluoride (indicator of potable water sources in areas where water supplies are fluoridated), potassium (high levels may indicate the presence of sanitary wastewater), and optical brighteners (indicative of laundry detergents).

5. Use test strips, test kits, and field meters (rinse similar to dipper) for most parameters (see **Table 4**).
6. Place laboratory samples on ice for analysis of bacteria and pollutants of concern.
7. Fill out chain-of-custody form for laboratory samples.
8. Arrange for pick-up or delivery of samples to laboratory for testing.
9. Dispose used test strips and test kit ampules properly.
10. Decontaminate testing personnel and equipment.

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

Field test kits or field instrumentation are permitted for all parameters except indicator bacteria and any pollutants of concern. Field kits need to have appropriate detection limits and ranges. **Table 4** lists various field test kits and field instruments that can be used for outfall sampling associated with the 2016 MS4 Permit parameters, other than indicator bacteria and any pollutants of concern. Analytic procedures and user's manuals for field test kits and field instrumentation will be maintained for test kits and instrumentation devices as selected.

Table 4 – Sampling Parameters and Analysis Methods

Analyte or Parameter	Instrumentation (Portable Meter)	Field Test Kit
Ammonia	CHEMetrics™ V-2000 Colorimeter Hach™ DR/890 Colorimeter Hach™ Pocket Colorimeter™ II	CHEMetrics™ K-1410 CHEMetrics™ K-1510 (series) Hach™ NI-SA Hach™ Ammonia Test Strips
Surfactants (Detergents)	CHEMetrics™ I-2017	CHEMetrics™ K-9400 and K-9404 Hach™ DE-2
Chlorine	CHEMetrics™ V-2000, K-2513 Hach™ Pocket Colorimeter™ II	NA
Conductivity	CHEMetrics™ I-1200 YSI Pro30 YSI EC300A Oakton 450	NA
Temperature	YSI Pro30 YSI EC300A Oakton 450	NA

Analyte or Parameter	Instrumentation (Portable Meter)	Field Test Kit
Salinity	YSI Pro30 YSI EC300A Oakton 450	NA
Temperature	YSI Pro30 YSI EC300A Oakton 450	NA
Indicator Bacteria: *E. coli* (freshwater) or Enterococcus (saline water)	EPA certified laboratory procedure (40 CFR § 136)	NA
Pollutants of Concern[5]	EPA certified laboratory procedure (40 CFR § 136)	NA

Testing for indicator bacteria and pollutants of concern must be conducted using analytical methods and procedures found in 40 CFR § 136. Samples for laboratory analysis must also be stored and preserved in accordance with procedures found in 40 CFR § 136. **Table 5** lists analytical methods, detection limits, hold times, and preservatives for laboratory analysis of dry weather sampling parameters.

Suspect dry weather flows without obvious evidence of contamination (olfactory, toilet paper, etc.) will be sampled and analyzed for the minimum parameters of E. coli or enterococcus (as appropriate), ammonia, surfactants, chlorine, temperature, specific conductance, and salinity. In the presence of dry weather flow, samples will be collected prior to inspections which could cause flow disturbance. Temperature and pH of the dry weather flow will be determined after samples are secured.

Table 5 – Required Analytical Methods, Detection Limits, Hold Times, and Preservatives

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Ammonia	**EPA**: 350.2, **SM**: 4500-NH3C	0.05 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2, No preservative required if analyzed immediately
Surfactants	**SM**: 5540-C	0.01 mg/L	48 hours	Cool ≤6°C

[5] Where the discharge is directly into a water quality limited water or a water subject to an approved TMDL, the sample must be analyzed for the pollutant(s) of concern identified as the cause of the water quality impairment.

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Chlorine	**SM**: 4500-Cl G	0.02 g/L	Analyze within 15 minutes	None Required
Temperature	**SM**: 2550B	*NA*	Immediate	None Required
Specific Conductance	**EPA**: 120.1, **SM**: 2510B	0.2 µs/cm	28 days	Cool ≤6°C
Salinity	**SM**: 2520	-	28 days	Cool ≤6°C
Indicator Bacteria: *E.coli* Enterococcus	*E.coli* **EPA**: 1603 **SM**: 9221B, 9221F , 9223 B **Other**: Colilert ®, Colilert-18® *Enterococcus* **EPA**: 1600 **SM**: 9230 C **Other**: Enterolert®	*E.coli* **EPA**: 1 cfu/100mL **SM**: 2 MPN/100mL **Other**: 1 MPN/100mL *Enterococcus* **EPA**: 1 cfu/100mL **SM**: 1 MPN/100mL **Other**: 1 MPN/100mL	8 hours	Cool ≤10°C, 0.0008% $Na_2S_2O_3$
Total Phosphorus	**EPA**: Manual-365.3, Automated Ascorbic acid digestion-365.1 Rev. 2, ICP/AES4-200.7 Rev. 4.4 **SM**: 4500-P E-F	**EPA**: 0.01 mg/L **SM** : 0.01 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2
Total Nitrogen (Ammonia + Nitrate/Nitrite, methods are for Nitrate-Nitrite and need to be combined with Ammonia listed above.)	**EPA**: Cadmium reduction (automated)-353.2 Rev. 2.0, **SM**: 4500-NO_3 E-F	**EPA**: 0.05 mg/L **SM** : 0.05 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2

SM = Standard Methods

6.3 Interpreting Outfall Sample Results

Outfall analytical data from dry weather sampling can be used to help identify the major type or source of discharge. **Table 6** shows values identified by the U.S. EPA and the Center for Watershed Protection as typical screening values for select parameters. These represent the typical concentration (or value) of each parameter expected to be found in stormwater. Screening values that exceed these benchmarks may be indicative of pollution and/or illicit discharges.

Table 6 – Benchmark Field Measurements for Select Parameters

Analyte or Parameter	Benchmark
Ammonia	> 0.5 mg/L
Conductivity	> 2,000 µS/cm
Surfactants	> 0.25 mg/L
Chlorine	> 0.02 mg/L (detectable levels per the 2016 MS4 Permit)
Indicator Bacteria: *E.coli* *Enterococcus* *(based on MA Water Quality Standards: 310 CMR 4)*	*E.coli*: the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 126 colonies per 100 ml and no single sample taken during the bathing season shall exceed 235 colonies per 100 ml. ***≥1000 colonies/100ml*** *Enterococcus:* the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 33 colonies per 100 ml and no single sample taken during the bathing season shall exceed 61 colonies per 100 ml. ***≥1000 colonies/100ml***

6.4 Follow-up Ranking of Outfalls and Interconnections

The Town of Longmeadow will update and re-prioritize the initial outfall and interconnection rankings based on information gathered during dry weather screening. The rankings will be updated periodically as screening information becomes available.

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

7 Catchment Investigation

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

7.1 System Vulnerability Factors

The DPW will review relevant mapping and historic plans and records to identify areas within the catchment with higher potential for illicit connections. The following information will be reviewed:

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

Based on the review of this information, the presence of the following **System Vulnerability Factors (SVFs)** will be assessed for catchments:

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
- Common or twin-invert manholes serving storm and sanitary sewer alignments
- Common trench construction serving both storm and sanitary sewer alignments
- Crossings of storm and sanitary sewer alignments where the sanitary sewer pipe is above storm drainage pipes
- Sanitary lines with underdrains
- Surcharging sewers or backups
- Areas formerly served by a combined system
- Sanitary infrastructure defects
- Dated sanitary sewer / storm drain infrastructure (> 40 years)
- Septic with poor soils or water table separation

- History of Board of Health actions addressing septic failure.
- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs

An SVF inventory will be documented for the catchments and retained in **Appendix C** as part of this IDDE Plan, and included in the annual report as appropriate.

7.2 Dry Weather Manhole Inspections

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

Infrastructure information will be incorporated into the storm system map, and catchment delineations will be refined based on the field investigation, where necessary. The SVF inventory will also be updated based on information obtained during the field investigations, if necessary. Several important terms related to the dry weather manhole inspection program are defined by the MS4 Permit as follows:

1. **Junction Manhole** is a manhole or structure with two or more inlets accepting flow from two or more MS4 alignments. Manholes with inlets solely from private storm drains, individual catch basins, or both are not considered junction manholes for these purposes.
2. **Key Junction Manholes** are those junction manholes that can represent one or more junction manholes without compromising adequate implementation of the illicit discharge program. Adequate implementation of the illicit discharge program would not be compromised if the exclusion of a particular junction manhole as a key junction manhole would not affect the permittee's ability to determine the possible presence of an upstream illicit discharge. A permittee may exclude a junction manhole located upstream from another located in the immediate vicinity or that is serving a drainage alignment with no potential for illicit connections.

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

In general, the manhole inspection methodology will be conducted in one of two ways (or a combination of both):

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

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

Inspection of key junction manholes will proceed as follows:

1. Manholes will be opened and inspected for visual and olfactory evidence of illicit connections.

2. If flow is observed, a sample will be collected and analyzed at a minimum for ammonia, chlorine, and surfactants. Field kits can be used for these analyses. Sampling and analysis will be in accordance with procedures outlined above. Additional indicator sampling may assist in determining potential sources (e.g., bacteria for sanitary flows, conductivity to detect tidal backwater, etc.).

3. Where sampling results or visual or olfactory evidence indicate potential illicit discharges or SSOs, the area draining to the junction manhole will be flagged for further upstream manhole investigation and/or isolation and confirmation of sources.

4. Subsequent key junction manhole inspections will proceed until the location of suspected illicit discharges or SSOs can be isolated to a pipe segment between two manholes.

5. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completion of key junction manhole sampling.

7.3 Wet Weather Outfall Sampling

Where a minimum of one (1) SVF is identified based on previous information or the catchment investigation, a wet weather investigation must also be conducted at the associated outfall. Wet weather investigations may occur concurrently with catchment area investigations, and as such must be completed by the end of the 10-year IDDE timeframe.

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

1. At least one wet weather sample will be collected at the outfall for the same parameters required during dry weather screening.

2. Wet weather sampling will occur during or after a storm event of sufficient depth or intensity to produce a stormwater discharge at the outfall. There is no specific rainfall amount that will trigger sampling, although minimum storm event intensities that are likely to trigger sanitary sewer interconnections are preferred. To the extent feasible, sampling should occur during the spring (March through June) when groundwater levels are relatively high.

3. If wet weather outfall sampling indicates a potential illicit discharge, then additional wet weather source sampling will be performed, as warranted, or source isolation and confirmation procedures will be followed as described in Section 7.4.

4. If wet weather outfall sampling does not identify evidence of illicit discharges, and no evidence of an illicit discharge is found during dry weather manhole inspections, catchment investigations will be considered complete.

7.4 Source Isolation and Confirmation

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

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

These methods are described in the sections herein. Standard Operating Procedures (SOPs) for some of these and other IDDE methods are provided in the DPW's *Facilities Inventory and Operations & Maintenance Plan.*

Public notification is an important aspect of a source investigation program. Prior to smoke testing, dye testing, or TV inspections, the DPW will notify property owners in the affected area. Smoke testing notification may include door knob flyers for single family homes and businesses.

7.4.1 Sandbagging

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

7.4.2 Smoke Testing

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

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

7.4.3 Dye Testing

Dye testing involves flushing non-toxic dye into plumbing fixtures such as toilets, showers, and sinks and observing nearby storm drains and sewer manholes as well as stormwater outfalls for the presence of the dye. Similar to smoke testing, it is important to inform local residents and business owners. Police, fire, and local public health staff may also be notified prior to testing in preparation of responding to citizen phone calls concerning the dye and their presence in local surface waters.

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

7.4.4 CCTV/Video Inspection

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

7.4.5 Optical Brightener Monitoring

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

7.4.6 IDDE Canines

Dogs specifically trained to smell human related sewage are becoming a cost-effective way to isolate and identify sources of illicit discharges. While not widespread at the moment, the use of IDDE canines is growing as is their accuracy. The use of IDDE canines is not recommended as a standalone practice for source identification; rather it is recommended as a tool to supplement other conventional methods, such as dye testing, in order to fully verify sources of illicit discharges.

7.5 Illicit Discharge Removal and Confirmatory Screening

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

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

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

7.6 Ongoing Screening

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

8 Training

Annual IDDE training will be made available to employees involved in the IDDE program. This training will at a minimum include information on how to identify illicit discharges and SSOs and may also include additional training specific to the functions of particular personnel and their function within the framework of the IDDE program. Training records will be maintained. The frequency and type of training will be included in the annual report.

9 Progress Reporting

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

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

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

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Appendix A

Outfall Inventory and Initial Ranking

FUSS & O'NEILL

MEMORANDUM

TO: Tim Keane, P.E., Town Engineer, Town of Longmeadow

FROM: Stefan Bengtson, MS; Julianne Busa, PhD

DATE: August 17, 2021

RE: MS4 Permit Services - Outfall Inventory and Initial Ranking

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This memo summarizes the methods and results of the Town of Longmeadow's stormwater outfall inventory and priority ranking. This work supports the Town's compliance with Section 2.3.4.7.a.iii of the 2016 Massachusetts Small MS4 General Permit, which requires such assessment as part of a defined illicit discharge detection and elimination (IDDE) program.

Ranking Process

The permit requires all outfall catchments within the Town's regulated area be ranked into one of four distinct categories (**Table 1**). These initial rankings must reflect screening factors that indicate illicit discharge potential or where potential illicit discharges could impair a waterbody's designated use. The permit lists nine screening factors, described below, to be used in the ranking process and allows for the consideration of other local conditions, as applicable. The rankings should be used to prioritize dry-weather screening of all regulated outfalls.

Upon completion of dry-weather outfall screening, the permit requires the initial rankings to be updated with new information obtained during screening to prioritize catchment investigations. Outfall catchments with higher priority have an accelerated investigation schedule that requires them to be screened ahead of lower priority catchments. Where sewer input has been identified, based on criteria defined in the permit, those catchments must be placed at the top of the priority list. Rankings of other outfalls may be modified at the Town's discretion.

Table 1: Catchment rank definitions in the 2016 MS4 permit

Rank	Permit Description
Problem	Outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall include any outfalls/interconnections where previous screening indicates likely sewer input
High	Outfalls/interconnections that have not been classified as Problem Outfalls and that are: • discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds; • determined by the permittee as high priority based on the characteristics listed below or other available information
Low	Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information

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

Catchment Delineation and Ranking

The Town of Longmeadow began mapping its stormwater outfalls and a substantial proportion of its stormwater infrastructure under the 2003 MS4 permit. Initial catchment delineations had also been previously delineated. Fuss & O'Neill reviewed and used the Town's existing catchment delineations to support GIS analysis conducted for the outfall ranking exercise. Outfall catchment areas were ranked into the appropriate priority categories using the screening factors described below.

Ranking Factors

The MS4 permit requires consideration of the following factors in developing the initial catchment priority rankings. Where these factors are present in a catchment, they indicate an increased likelihood that an illicit discharge will be detected.

1. Past Discharge Screening Reports and Complaints

   Town staff communicated with Fuss & O'Neill that outfall screening inspections required under the 2016 MS4 Permit had recently been completed and that no evidence of likely sewer input had been identified. Fuss & O'Neill incorporated the results of these inspections into the ranking.

2. Public Health Area

   There are no catchments within the Town of Spencer's MS4 regulated area that discharge to a drinking water supply or public bathing beach or other recreation area.

3. Receiving Water Quality

   This category is an amalgamation of the permit factors 'poor receiving water quality' and 'water quality limited water bodies'. Including both would double-count outfalls discharging to such waters. Factor scores were based on the 2016 Massachusetts Draft Integrated List of Waters. Catchments with direct discharges to waterbodies designated as impaired were given higher scores while those that directly discharge to waterbodies not listed as impaired, or unassessed, received lower scores. Catchments with outfalls directly discharging to the Connecticut River and Longmeadow Brook, listed as impaired for E. coli bacteria, were automatically ranked into the "High" category based on permit requirements in Appendix H.III.2.a.ii.

4. Land Use/Generator Density

   A qualitative estimate of generator density was assigned to each catchment using land use data, aerial imagery, and Google maps/streetview to identify potential locations of pollutant generators.

Longmeadow has reasonably uniform levels of land use development intensity within its regulated area, consisting primarily of single family residential households, extending to more densely-developed commercial and institutional areas. Data to calculate a numeric generator density was limited and disparate and based on factors such as average parcel size, which may not necessarily reflect illicit discharge potential. Fuss & O'Neill therefore assigned land uses an illicit discharge risk, as listed in the permit, and calculated the percent of each catchment within each risk category. Catchments were assigned to a risk category based on the majority land use risk within each catchment. Aerial imagery was also used to account for limitations associated with the resolution of the land use data and category assignments and were changed manually if necessary.

5. Age of Development and Infrastructure
   Development age was determined from the Massachusetts Level 3 parcels database, which includes a Year Built attribute. Based on this Year Built attribute, developed parcels within each catchment were sorted into one of three categories: 1990s to present, 1970 to 1990, and pre-1970. These dates correspond to eras of water quality regulations and major steps forward in stormwater technologies in land development. An area-weighted average year built was calculated for each catchment. Catchments were manually assigned to a category based on this weighted average value. Catchments that fell into the "pre-1970" category were given the highest score.

6. Density of Aging Septic Systems
   Almost all of Longmeadow is served by sanitary sewer with minor areas, largely along West Road and Dunn Road, served by septic systems. Because these areas are not located within an outfall catchment, all catchments were noted as being serviced by sanitary sewer. In catchments serviced by septic systems, had any been present within an outfall catchment, septic age would have been assigned based on development age. Catchments in the "pre-1970" category were assumed to have septic systems more than 40 years old and were given the highest score. This scoring method reflects characteristics of septic systems, their installation, and both current and past regulations governing them. It was assumed that parcels with a year-built attribute of prior to 1940 had received a septic upgrade prior to 1970.

7. Sewer Conversion
   Based on the information above, the majority of Longmeadow is serviced by sanitary sewer. Catchments serviced by sewers were assumed to have experienced conversion from septic systems or cesspools at some point in time. All catchments serviced by sewers were therefore given the higher score for this factor. Catchments where some homes are served by septic systems, had they been present, would have received a score of zero for this factor.

8. Culverted Streams
   Catchments with buried streams were given the highest score. The Town's GIS mapping includes culvert locations, which were manually reviewed to identify which, if any, were longer than necessary for a simple road crossing. All culverts were identified as simple road crossings, and all catchments received the lowest score for this factor.

9. Historic Combined Sewer Systems

Combined sewers are not present in Longmeadow; therefore this screening factor was removed from the matrix.

Scoring Ranking Factors

To facilitate ranking of catchments into categories, Fuss & O'Neill developed a ranking matrix where scores were assigned to reflect catchment-specific information. Further detail on the assignment of scores is available in **Table 2**. Assigned scores were summed and then scaled to fall between 0 and 10, where a score of zero indicates the lowest relative likelihood of the presence of illicit discharge. Rankings were assigned manually and reflect the assigned scores, as well as drainage to impaired waters.

Table 2: Outfall catchment screening factors required for consideration by the 2016 MS4 permit

Ranking Factor	Permit Description	Scoring Method	Data source
Past discharge screening reports and/or complaints	Results of past IDDE outfall screening conducted by Town and Reports to Town of odors or discharge from outfalls.	Screened, No flow: 0 Unscreened: 1 Flow, no IDDE evidence: 2 IDDE evidence: 3	Town of Longmeadow Engineering Department
Public Health Area	Outfall discharges to waterbody containing a public bathing area or drinking water source	**Public Health Area** No: 0 Yes: 3	None in Regulated Area
Receiving Water Quality	Water quality limited waterbodies that receive a discharge from the MS4 or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment	**Receiving Water Quality** Good or Unassessed: 0 Non-TMDL impairment (e.g. non-native plants): 1 Impaired: 2 TMDL: 3	MassDEP Integrated List of Waters 2016
Land Use / Generator Density	Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges.	**Generator Density** Excluded: -3 Low: 1 Medium: 2 High: 3	MassGIS Land Use (2016), Aerial imagery, Google Maps and Streetview
Development Age and Septic Age	Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a low illicit discharge potential	**Development age:** 1990 - present: 1 1970 – 1990: 2 Pre-1970: 3	MassGIS Level 3 Parcel Data
Density of Aging Septic Systems	Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential	**Septic age:** < 20 years: 0 20-40 years: 1 40+ years: 3 Sewered: 0	Not applicable to Longmeadow

Ranking Factor	Permit Description	Scoring Method	Data source
Sewer Conversion	Contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential	**Sewer Conversion** No: 0 Yes: 3	Town of Longmeadow information
Culverted Stream	Any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential	**Stream Crossings** Road crossings only: 0 Limited Potential: 1 High Potential: 3	Town of Longmeadow GIS MassDEP Hydrography Aerial imagery
Historic combined sewer systems	Contributing areas that were once serviced by a combined sewer system, but have been separated may have a high illicit discharge potential	**Past CSO separation** No: 0 Yes: 3	Not applicable to Longmeadow

Results

In Longmeadow, Development Age and Receiving Water Quality emerged as the primary drivers of IDDE potential and therefore of the priority ranking. Most screening factors were uniform or varied little across the MS4-regulated area.

The Town's stormwater system mapping includes 140 catchments and 172 outfalls in the regulated area (according to the Town's outfall mapping). Fuss & O'Neill confirmed each outfall was associated with a catchment delineation; some catchments include multiple outfalls. Of the 140 ranked catchments, 53 were ranked as High Priority catchments (*Attachment A*). These 53 outfalls/catchments are typically located around US Route 5, Longmeadow Brook, and the areas discharging to Porter Lake, which are parts of the regulated area characterized by older development, discharging to impaired waters. The 79 Low Priority catchments were typically those that were more recently developed (after the promulgation of stormwater and wastewater regulatory standards) and characterized by lower density of development, since these areas are generally less likely to contain illicit connections. These Low Priority catchments fall under this category due in part to their discharging to unimpaired waters. No Problem or Excluded catchments were identified.

The MS4 permit next requires that these results be used during catchment investigations to prioritize investigative work in those areas with the highest likelihood of an illicit connection. All outfall catchments must be fully investigated by June 30, 2028 and following the procedures set forth in the Town's IDDE plan.

Attachment 1
Initial Outfall Catchment Ranking

Outfall ID	Past Discharge Reports	Receiving Water Quality	Density of Generating Sites	Age of Development and Infrastructure	Past Sewer Conversion	Historic CSOs	Septic Age	Culverted Streams	Public Health Area	Illicit Connection TMDL	Score (0-10)	Priority
42	Flow, No IDDE Evidence	Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	10.0	High
112	Flow, No IDDE Evidence	Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	10.0	High
118	Flow, No IDDE Evidence	Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	10.0	High
11	Screened, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	8.3	High
105	Flow, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	8.3	High
107	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	8.3	High
108	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	8.3	High
109	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	8.3	High
4	Flow, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	High
27	Flow, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	High
72	Flow, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	High
138	Flow, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	High
24	Flow, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
29	Flow, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
35	Screened, No IDDE Evidence	Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
54	Flow, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
57	Flow, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
64	Flow, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
75	Flow, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
80	Flow, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
83	Flow, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
84	Flow, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
95	Screened, No IDDE Evidence	Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
117	Screened, No IDDE Evidence	Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
148	Flow, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
150	Screened, No IDDE Evidence	Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
132, 133	Flow, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	6.7	Low
5	Flow, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	5.0	High
25	Flow, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	5.0	High
70	Flow, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	5.0	High
126	Flow, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	5.0	High
127	Flow, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	5.0	High
136	Flow, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	5.0	High
40, 135	Flow, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	5.0	High
31	Flow, No IDDE Evidence	Good or unassessed	Low	1970-1990	Yes	No	Sewered	No	No	No	5.0	Low
32	Flow, No IDDE Evidence	Good or unassessed	Low	1970-1990	Yes	No	Sewered	No	No	No	5.0	Low
66	Flow, No IDDE Evidence	Good or unassessed	Low	1970-1990	Yes	No	Sewered	No	No	No	5.0	Low
140	Screened, No IDDE Evidence	Good or unassessed	High	1970-1990	Yes	No	Sewered	No	No	No	5.0	Low
13	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
21	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
28	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
38	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
39	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
41	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
47	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
53	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
55	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
61	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
93	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
96	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
99	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
100	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
101	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
102	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
111	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
114	Flow, No IDDE Evidence	Bacteria Impaired	Low	Post-1990	Yes	No	Sewered	No	No	No	3.3	High
115	Flow, No IDDE Evidence	Bacteria Impaired	Low	Post-1990	Yes	No	Sewered	No	No	No	3.3	High
119	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
120	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
122	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
128	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
149	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
129, 130, 131	Screened, No IDDE Evidence	Bacteria Impaired	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	High
2	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
3	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
9	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
19	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
20	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
22	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
23	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
26	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
30	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
36	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
37	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
43	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
44	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
45	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
46	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
48	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
49	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
56	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
63	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
67	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
68	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
73	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
74	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
76	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
77	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
78	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
79	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
81	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
82	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
86	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
87	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
88	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
89	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
90	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
91	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
97	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
98	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
104	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
121	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
125	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
134	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
137	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
139	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
141	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
142	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
143	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
144	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
146	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
147	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
58, 59	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
85, 94	Screened, No IDDE Evidence	Good or unassessed	Low	Pre-1970	Yes	No	Sewered	No	No	No	3.3	Low
1	Screened, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	High
6	Screened, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	High
12	Screened, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	High
62	Screened, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	High
110	Screened, No IDDE Evidence	Bacteria Impaired	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	High
7	Screened, No IDDE Evidence	Good or unassessed	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	Low
10	Screened, No IDDE Evidence	Good or unassessed	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	Low
33	Screened, No IDDE Evidence	Good or unassessed	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	Low
34	Screened, No IDDE Evidence	Good or unassessed	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	Low
52	Screened, No IDDE Evidence	Good or unassessed	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	Low
60	Screened, No IDDE Evidence	Good or unassessed	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	Low
65	Screened, No IDDE Evidence	Good or unassessed	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	Low
69	Screened, No IDDE Evidence	Good or unassessed	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	Low
116	Screened, No IDDE Evidence	Good or unassessed	Low	1970-1990	Yes	No	Sewered	No	No	No	1.7	Low
8	Screened, No IDDE Evidence	Bacteria Impaired	Low	Post-1990	Yes	No	Sewered	No	No	No	0.0	High
14	Screened, No IDDE Evidence	Bacteria Impaired	Low	Post-1990	Yes	No	Sewered	No	No	No	0.0	High
71	Screened, No IDDE Evidence	Bacteria Impaired	Low	Post-1990	Yes	No	Sewered	No	No	No	0.0	High
113	Screened, No IDDE Evidence	Bacteria Impaired	Low	Post-1990	Yes	No	Sewered	No	No	No	0.0	High

Appendix B

Sanitary Sewer Overflow Inventory

IDDE Plan

Current Inventory of Known SSOs

SSO Location	Discharge Statement	Date	Time start	Time End	Estimated volume	Description	Mitigation Completed
38 Twinbrook Circle		3/19/2020	12:00		<10,000 G	Sewer system blockage/collapse – nylon disinfectant wipes	yes
32 Severn Street	Ground surface	4/6/2018	14:30	17:00	2 GPM	Pool contractor pushed dirt and stumps down bank onto the exposed cast iron sewer main	Lime placed on impacted areas
Longmeadow St. @ Morningside Drive	Catch basin to receiving waters	10/18/2017	12:15	12:45	50 Gallons	Sewer system blockage	Jet truck jetted downstream clearing blockage
Elm Avenue		7/30/2017	9:00		<10,000 G	Rain, broken main	Repaired the main
Arcadia St. Siphon		4/21/2015	18:00		<10,000 G	Sewer blockage, low flow siphon	Jetted siphon from downstream, adding to quarterly flushing schedule

IDDE Plan

Current Inventory of Known SSOs

SSO Location	Discharge Statement	Date	Time start	Time End	Estimated volume	Description	Mitigation Completed
231 Maple Road		11/8/2014	12:30		<10,000 G	Sewer backup	Jetted main and educated the day care / council on ageing about flushing wipes
North Interceptor (behind 22 Wildflower Ln)	SMH to ground surface (forested area)	6/16/2021	15:00	9:00	10 GPM	Sewer line was glogged with rags and wipes	used jet/vac truck to clear blockage, lime on ground, rechecked mains after period of time
North Interceptor (behind 56 severn street)	SMH to ground surface (forested area)	7/30/2021	11:00	14:00	5 GPM	Sediment caused back up	jetted main, applied lime to effected areas, rechecked mains after period of time

Appendix C

Outfall Catchment
System Vulnerability Factor (SVF) Inventory

[To Be Developed]

Appendix D

[Reserved]