ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM CITY OF HOLYOKE, MASSACHUSETTS

Prepared for

CITY OF HOLYOKE, MASSACHUSETTS AND SUEZ

September 2020

4 Blanchard Road
P.O. Box 85A
Cumberland, Maine 04021
Phone: 207.829.5016 smemaine.com

ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

SME
SEVEE & MAHER ENGINEERS

TABLE OF CONTENTS

TABLE OF CONTENTS (cont'd)

APPENDICES

LIST OF FIGURES

LIST OF TABLES

ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM
CITY OF HOLYOKE, MASSACHUSETTS

1.0 INTRODUCTION

1.1 MS4 Program

This Illicit Discharge Detection and Elimination (IDDE) Program has been developed by the City of Holyoke, Massachusetts and Suez to address the requirements of the United States Environmental Protection Agency's (U.S.EPA) and the Massachusetts Department of Environmental Protection (MassDEP) *General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts*, effective July 1, 2018, hereinafter referred to as the "2018 MS4 Permit" or "MS4 Permit"

The MS4 Permit requires regulated communities address six Minimum Control Measures (MCM) including:

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

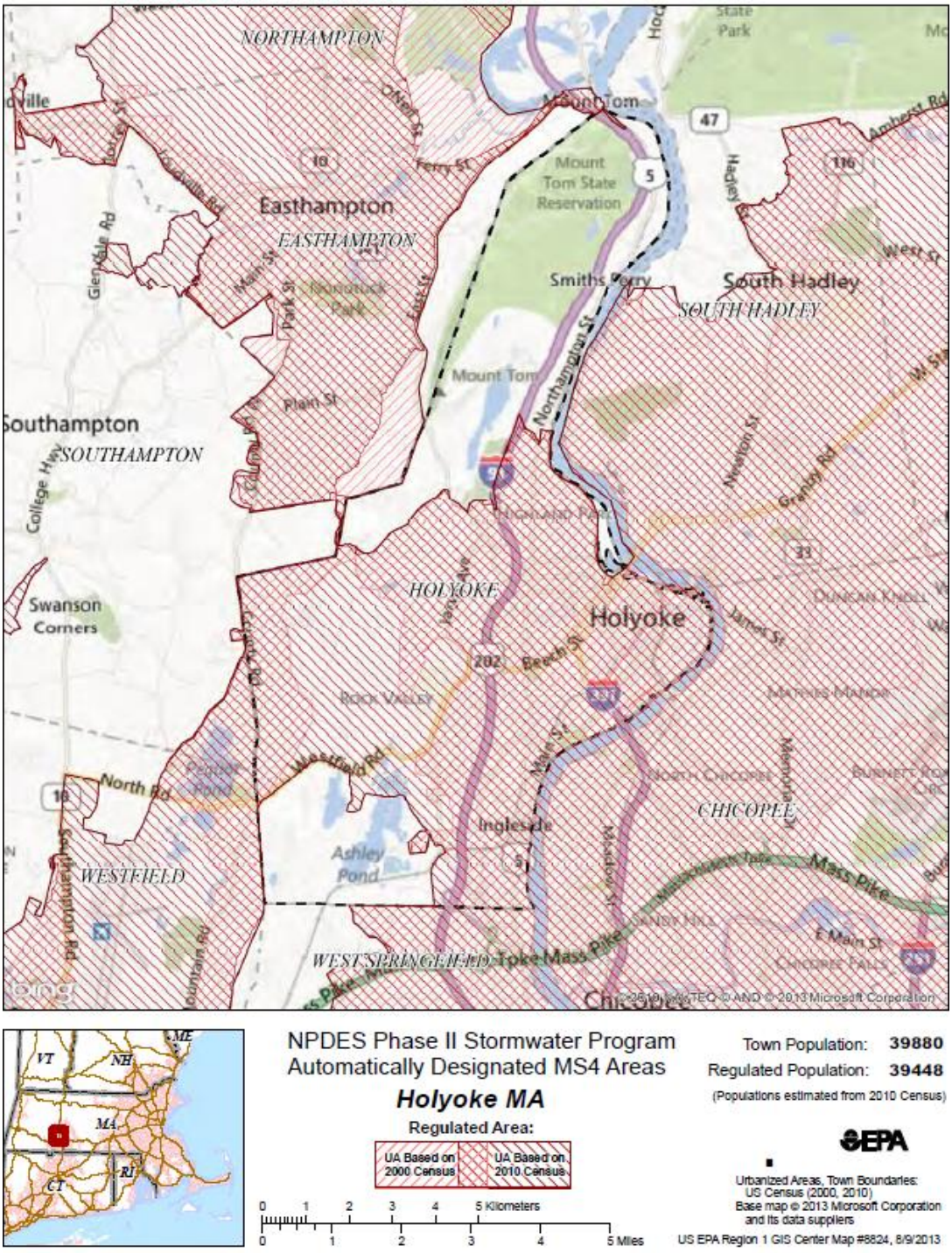
Under MCM 3, the City of Holyoke, hereafter referred to as "the City" or "Holyoke," and Suez are required to implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system (MS4) and implement procedures to prevent such discharges. The IDDE program must be recorded in a written (hardcopy or electronic) document. This IDDE Program has been prepared to address this requirement.

1.2 Geographical Scope of IDDE Program

The MS4 Permit requires municipalities to implement the IDDE program for those portions of the MS4 that are located either fully or partially within the Urbanized Area (based on 2010 U.S. Census) or located in a geographical area designated by U.S.EPA as requiring a permit. Figure 1-1 depicts the urbanized areas for Holyoke.

FIGURE 1-1

HOLYOKE MS4 URBANIZED AREAS



NPDES Phase II Stormwater Program
Automatically Designated MS4 Areas

Holyoke MA

Regulated Area:

UA Based on 2000 Census | UA Based on 2010 Census

0 1 2 3 4 5 Kilometers

0 1 2 3 4 5 Miles

Town Population: **39880**

Regulated Population: **39448**

(Populations estimated from 2010 Census)

EPA

Urbanized Areas, Town Boundaries:
US Census (2000, 2010)
Base map © 2013 Microsoft Corporation and its data suppliers
US EPA Region 1 GIS Center Map #8824, 8/9/2013

1.3 Illicit Discharges

An illicit discharge is any discharge to an MS4 that is not composed entirely of stormwater, except for site-specific NPDES permitted discharges and discharges resulting from firefighting activities and allowable non-stormwater discharges as outlined in Section 1.4.

Illicit discharges may enter the drainage system through direct or indirect connections and may be intentional or unintentional. Direct connections include cross-connections of sewer services to the storm drain system. Indirect illicit discharges may be more difficult to detect and may include failing septic systems that discharge untreated sewage to a storm ditch or swale that is part of an MS4, or a sump pump that discharges contaminated water to storm drains intermittently.

Some Illicit discharges are intentional such as dumping used oil into catch basins, seasonal dumping of swimming pool water, or illegally connecting a new sewer lateral into a storm drain pipe. Unintentional illicit discharges include breakouts from failing septic systems that enter the MS4, or disposal of floor wash water to a floor drain in an old building where the drain is thought to connect to a sewer line but connects to a storm drain instead.

When not addressed, illicit discharges can contribute high levels of pollutants such as metals, toxics, oil, grease, solvents, nutrients and bacteria (some pathogenic) to surface waters.

1.4 Allowable Non-Stormwater Discharges

The following non-stormwater discharges are allowed under the MS4 Permit unless the permittee, U.S.EPA, or MassDEP finds the discharge to be a significant contributor of pollutants to the MS4:

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground water
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20))
- Uncontaminated pumped groundwater
- Discharge from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water, springs
- Water from crawl space pumps

- Footing drains
- Lawn watering
- Individual resident car washing
- De-chlorinated swimming pool discharges
- Street wash waters
- Residential building wash waters without detergents

If any of the above discharges are identified as significant contributors of pollution to the MS4, they will be considered "Illicit discharges" and addressed in the IDDE program.

1.5 Receiving Waters and Impairments

Table 1-1 lists the impaired waters that are within the boundaries of Holyoke's regulated area based on the 2016 Massachusetts Integrated List of Waters, produced by the MassDEP. 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.

Because Holyoke is in the watershed of Long Island Sound (LIS), which has an approved total maximum daily load (TMDL) for nitrogen, the City is required to meet additional requirements in the MS4 Permit with respect for nitrogen discharges (MAR041000, Appendix F, part B1).

TABLE 1-1

IMPAIRED WATERS

Water Body Name	Segment ID	Category[1]	Impairment	Comments
Connecticut River	MA34-04	5	*Escherichia coli*, PCB in fish tissue	
Connecticut River	MA34-05	5	*Escherichia coli*, PCB in fish tissue	
Log Pond Cove	MA34124	5	Non-Native aquatic plants, PCB in fish tissue	Part of Connecticut River
Lake Bray	MA34013	4c	Non-native aquatic plants	Outside Urban Area
Pequot Pond	MA32055	5	Eurasian milfoil, chlorophyll-a, Non-Native aquatic plants, *Enterococcus*, dissolved oxygen	Located in Southampton Urban Area. Outfalls from Holyoke drain to a tributary of the Pond

Notes:
[1] Category 4c – Impairment not caused by a pollutant; Category 5 – Impaired or threatened for one or more uses and requiring a TMDL.

1.6 IDDE Program Objectives Requirements and Timeline

The objective of the IDDE Program is to systematically find and eliminate sources of non-stormwater discharges to the MS4 and implement procedures to prevent such discharges. The IDDE Program must include the following:

- Legal authority to prohibit and investigate suspected illicit discharges, eliminate and remove illicit discharges and enforce the IDDE
- MS4 mapping
- Sanitary Sewer Overflow (SSO) inventory, reporting and mitigation
- Screening of catchment[1] and outfalls during wet and dry weather conditions
- Sampling procedures
- Priority ranking of outfalls and interconnections both preliminary rankings and follow up (post catchment investigation) rankings
- Follow up screening
- Employee training
- IDDE program evaluation

Figure 1-2 shows the IDDE investigation procedure and Table 1-2 shows the IDDE implementation timeline.

[1] Catchment: the area that drains to an individual outfall or interconnection. Catchments are typically delineated based on topographic contours and mapped drainage infrastructure where available.

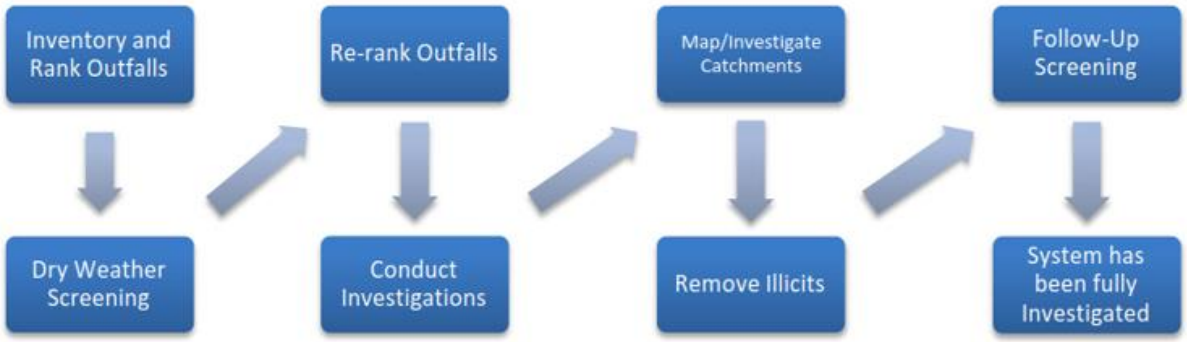
TABLE 1-2

IDDE PROGRAM IMPLEMENTATION TIMELINE

IDDE Program Requirement	Completion Date from Effective Date of Permit					
	1 Year 6/30/19	1.5 Years 12/31/19	2 Years 6/30/20	3 Years 6/30/21	7 Years 6/30/25	10 Years 6/30/28
Written IDDE Program Plan	X					
SSO Inventory	X					
Preliminary Ranking of Outfalls and interconnections	X					
Written Catchment Investigation Procedure		X				
Phase I Mapping (COVID 19 EXTENSION)			-	X		
Phase II Mapping						X
IDDE Regulatory Mechanism or By-law (if not already in place)				X		
Dry Weather Outfall Screening				X		
Follow-up Ranking of Outfalls and Interconnections				X		
Catchment Investigations – Problem Outfalls			Start		Finish	
Catchment Investigations – of High and Low Priority Outfalls			Start			Finish

FIGURE 1-2

IDDE INVESTIGATION PROCEDURE



Source: Illicit Discharge Detection and Elimination (IDDE) Plan template, June 30, 2016 for Central Massachusetts Regional Stormwater Coalition.

2.0 OBJECTIVE, AUTHORITY AND IDDE RESPONSIBILITIES

The objective of the IDDE program is to systematically find and eliminate illicit discharges to Holyoke's MS4 and prevent them from happening in the future.

2.1 Legal Authority

Holyoke's Stormwater Ordinance was adopted by City Council on May 17 2017. A copy of the ordinance is in Appendix A. Specifically, Holyoke's Stormwater Ordinance grants the city the 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; and
- Implement appropriate enforcement procedures and actions.

Copies of bylaws and additional relevant ordinance sections are in Appendix B.

2.2 IDDE Program Responsibilities

As owner and operator of the MS4, the City and Suez hold joint responsibility for implementing the IDDE program. The City Public Works Department (PWD) is the lead municipal agency that works with Suez and other departments to administer various aspects of the program. Specific IDDE Program responsibilities and responsible parties are listed in (Table 2-1).

TABLE 2-1

IDDE RESPONSIBILITIES

Responsible Department(s)/ Names (s)	IDDE Responsibilities
SUEZ Area Manager	Illicit Discharge (ID) Investigations; removal, and removal confirmations
PWD Superintendent	Enforcement of ID procedures and Actions
SUEZ Area Manager	SSOs Investigations and Maintenance of SSO Inventory
SUEZ Area Manager; PWD Superintendent	Catchment Investigations; identifying system vulnerability factors (SVF), manhole inspections and isolation to confirm sources of ID.
SUEZ Area Manager; PWD Superintendent	Catchment prioritization
SUEZ Area Manager	Field checks and documentation of new / updated MS4 infrastructure; outfalls and interconnections; update MS4 maps
SUEZ Area Manager	Dry weather outfall screens/inspections and outfall sample collection
SUEZ Area Manager	Wet weather outfall screens/inspections and sample collection
SUEZ Area Manager, PWD Superintendent	Rank /Prioritize and reprioritize Outfalls and Interconnections
SUEZ Area Manager, City Engineer; PWD Superintendent	Wet and dry weather data review, tracking, collection and annual reporting
SUEZ Area Manager	Track and provide Annual report of Illicit discharge removal
SUEZ Area Manager	Confirmatory Outfall and interconnection screening after ID has been removed
SUEZ Area Manager, PWD Superintendent	IDD Program Progress Annual Report (SSOs, IDs identified and removed; # and % total outfall catchments evaluated; dry and wet weather screening results; volume of sewage removed.
SUEZ Area Manager	IDDE training frequency and type in annual report

Suez Area Manager

Michael Burke

413.534.2222

City Engineer

Bob Peirent, P.E.

413.322.5605

City Public Works Department Superintendent

Michael McManus

413.322.5645

3.0 STORMWATER SYSTEM MAPPING

Holyoke's MS4 system maps are used to identify key stormwater infrastructure, factors influencing proper system operation and the potential for illicit sanitary discharges. Holyoke and Suez developed GIS maps of its stormwater system (Map Books) to meet requirements of the 2003 MS4 permit and updated them in 2013. In 2019 the GIS maps were updated to include the most recent data on areas where stormwater is combined with the sewer systems. A copy of the system maps is in Appendix B.

The MS4 permit requires two phases of mapping. Phase I mapping includes mapping general features and Phase II Mapping includes more detailed mapping.

3.1 Phase I Mapping

The following Phase I information must be collected or updated through field investigations and mapped by June 30, 2021:

- Outfalls and receiving waters
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- 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)
- Waterbodies identified by name and indication of all use impairments as identified on the most recent U.S.EPA approved Massachusetts Integrated List of Waters Report
- Initial catchment delineations based on system data and topographic information.

3.2 Phase II Mapping

The following Phase II information must be collected or updated through field investigations and mapped by June 30, 2028:

- Outfall spatial location (latitude and longitude with a minimum accuracy of +/- 30 ft)
- Pipes
- Manholes
- Catch basins
- Refined catchment delineations that reflect information collected during catchment investigations

- Sanitary Sewer System
- Combined Sewer System

3.3 Additional Mapping

The following elements are not required but U.S.EPA and MassDEP recommends that they be included in the system map as information becomes available:

- Storm sewer material, size (pipe diameter) and age
- Sanitary sewer system material, size (pipe diameter) and age
- Privately-owned stormwater treatment structures
- Properties known or suspected to be served by a septic system that are in high-density areas served by municipal sanitary sewer
- MS4 areas that have received or could receive flows from septic system discharges (areas with poor soils, or high groundwater elevations unsuitable for conventional subsurface disposal)
- 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).

4.0 SANITARY SEWER OVERFLOWS (SSOS)

The MS4 permit requires municipalities to prohibit illicit discharges, including sanitary sewer overflows (SSOs) to the MS4. An SSO is a discharge 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 system bypasses that allow stormwater and groundwater to overload the system, power failures, and human error.

4.1 SSO Inventory

As part of its Stormwater Management Plan (SWMP), the City maintains an SSO inventory that includes the following information:

- Location (approximate street crossing/address and receiving water, if any)
- A clear statement of whether the discharge entered a surface water directly or entered the MS4
- Date(s) and time(s) of each known SSO occurrence
- Estimated volume(s) of the occurrence
- Description of the occurrence including known or suspected cause(s)
- Mitigation and corrective actions and completion dates as well as planned corrective measures and their implementation schedule

The SSO inventory is updated annually to include dry weather screening data and other relevant inspection data and is included in the Annual Report. The SSO inventory is summarized in Table 4-1.

4.2 Removal and Notification

Upon detecting or receiving notice of an SSO, the City shall eliminate it as soon as possible and take interim mitigation steps to minimize the discharge of pollutants to the MS4 until the SSO is eliminated. Holyoke provides oral notice to the U.S.EPA within 24 hours of becoming aware of an SSO. The City provides written notice to the U.S.EPA and MADEP within 5 days of becoming aware of an SSO.

The period between identification and elimination of an SSO is not a grace period. Discharges from an MS4 that are mixed with an SSO are not authorized by this Permit and remain unlawful until eliminated.

TABLE 4-1

MS4 SSO INVENTORY

SSO Location[1]	Discharge Statement[2]	Date	Duration	Volume (gals)[3]	Description[4]	Mitigation Steps[5]	Date Completed[6]
1062 1/2 Main St.	Connecticut River	1/22/2015	21 hrs	63,000	Force main failure	Repaired broken main	
106 ½ Main St	Connecticut River	1/22/2015	21 hrs.	63,000	Force main failure	Repaired broken main	
206 Maple St.	MS4	7/1/2015	1.5 hrs.	1,350	Blockage of grease	Jet cleaned/ degreased line	
Westfield Rd.	MS4	10/9/2015	45 mins.	2,250	Rags and roots	Removed blockage of roots and rags. CCTV main to verify blockage was cleared. Put MH on quarterly inspection.	
60 Locust St.	MS4	10/30/2015	1 hr.	240	Roots	Removed root mass. Performed root cutting on the sewer main.	
50 Holy Family Rd.	Tannery Brook	12/8/2015	40 mins	2,000	Debris/ Rags & Grease	Removed blockage of debris. Jet cleaned the neighborhood. This on quarterly cleaning program.	
20 Easthampton Rd.	Green Brook	1/3/2016	1 hr.	300	Rags	Removed blockage of rags. Jet cleaned sewer main. Put MH on quarterly inspection.	
10 Cottage Ave.	Ground	6/8/2016	1 hr.	420	Rags	Removed blockage of rags. Jet cleaned City sewer main.	
500 Easthampton Rd.	Broad Brook	2/11/2017	8 hrs.	4,800	Grease	Removed grease blockage. Jet cleaned sewer main.	
340 Tokeneke Rd.	Tannery Brook	4/7/2017	30 mins.	150	Debris/ Rags & Grease	Removed debris blockage. Jet cleaned the neighborhood. This area is on quarterly cleaning schedule.	
150 Lower Westfield Rd.	Tannery Brook	6/2/2017	20 mins.	100	Grease/Rags	Removed blockage. Jet cleaned sewer main.	
Rt. 141/ Easthampton Rd.	Catch basin	9/5/2017	1 hr.	300	Debris/Rags& Roots	Removed blockage of roots. Performed root cutting on this section of sewer main.	
500 Easthampton Rd.	Broad Brook	10/17/2017	4 hrs.	2,400	Grease	Removed grease blockage. Hired outside contractor to degrease & CCTV 2500 ft of sewer main.	
Leary Dr.	Day Brook	4/3/2018	30 mins.	105	Debris/Rags	Removed blockage of rags. Jet cleaned the neighborhood. Put on quarterly cleaning schedule.	
72 Old Jarvis Ave.	Ground	5/11/2018	30 mins.	90	Rags	Removed blockage. Jet cleaned the main.	
Tokeneke & Holy family Rd.	Tannery Brook	6/11/2018	45 mins.	225	Grease & Rags	Removed blockage. Jet cleaned/ degreased the City sewer main.	
Hillside & Cherry St.	Ground	6/18/2018	20 mins.	100	Grease & Rags	Removed blockage. Jet cleaned sewer main. Removed broomstick that was wedged in MH.	
River Terrace (Highland Inter)	Conn. River	11/5/2018	56 hrs.	1,344,000	Interceptor/ Manhole failure	Repaired Highland Interceptor. Made emergency repair to the interceptor.	
Rt 5 near Smith's Ferry P. S.	Ground	12/5/2018	2 hrs.	25	Roots	Removed blockage of roots. Jet cleaned & CCTV sewer main.to verify root mass was cleared.	
60 Locust St.	Collection System	1/6/2019	2 hrs.	600	Roots	Removed root mass. Performed root cutting on sewer main.	
50 Holy Family Rd.	Tannery Brook	1/24/2019	1.5 hrs.	2,250	Grease & Rags	Removed blockage. Jet cleaned sewer main.	
582 Pleasant St.	Collection System	2/10/2019	1 hr.	250	Grease & Rags	Removed blockage of rags. Jet cleaned sewer main.	
Whitney Ave.	Ground	4/4/2019	5 mins.	200	Grease	Cleared blockage with sewer spoon. Jet cleaned 700 feet of sewer main.	
75 Reservation Rd.	Ground	4/24/2019	2 hrs.	30	Debris & Rocks	Removed blockage. Sewer main will be jet cleaned	summer 2019
200 Whiting Farms Rd.	Tannery brook	7/23/2019	1.5hrs.	>10,000	Grease & Rags	Removed blockage Main was put on Bi-monthly cleaning list.	7/23/2019
18A CSO Discharge	Conn River.	9/20/2019	5 mins.	1,500	Blocked City sewer main	Removed blockage. Causing manhole to surcharge and discharge out CSO 18A.	9/20/2019
CSO 20 (Cleveland St.) & CSO 21B (river Terrace)	Conn. River	9/17/2019	2.75hrs.	102,660	Water main break caused by Contractor	Water dept shut water off till repairs were made.	9/17/2019
20 Easthampton Rd.	Green Brook	1/13/2020	1hr	300	Grease	Removed blockage. De greased sewer main.	1/13/2020

Notes:

1 Location (approximate street crossing/address and receiving water, if any)
2 A clear statement of whether the discharge entered a surface water directly or entered the MS4
3 Estimated volume(s) of the occurrence
4 Description of the occurrence indicating known or suspected cause(s)
5 Mitigation and corrective measures taken or planned
6 Date mitigation and corrective measures completed

5.0 ASSESSMENT AND PRIORITY RANKING OF CATCHMENTS AND OUTFALLS

The MS4 permit requires Holyoke and Suez to assess and rank outfalls and interconnections based on their illicit discharge potential and the significance of the potential public health issues associated with such discharges. The rankings are used to prioritize the order of screening outfalls and interconnections, and of conducting catchment investigations for evidence of illicit discharges and SSOs. The rankings are also used to track progress towards meeting permit milestones.

Outfalls and Interconnections are defined as follows:

- Outfall (40 CFR § 122.2): the point where the M4 discharges to waters of the United States. Outfalls do not include open conveyances that connect two MS4s or pipes, tunnels and other conveyances that connect segments of the same stream or waters or are used to convey waters of the United States. Culverts longer than a simple road crossing are considered outfalls unless it is confirmed that they are free of any connections and simply convey waters of the United States.
- Interconnection**:** 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.

5.1 Outfall/Interconnection Inventory and Ranking

Suez maintains an inventory of each outfall and interconnection that discharges from the MS4. The inventory includes the outfall and interconnection location and condition and a means of tracking all inspections, screenings, samplings, and other activities covered by the IDDE program. Rankings are updated to incorporate information from dry weather screening.

Outfalls and interconnections are classified as follows:

1) Problem Outfalls and Interconnections: have known or suspected contributions of illicit discharges and include outfalls/interconnections where previous screening indicates likely sewer input.
2) High Priority Outfalls: discharge to area of concern to public health due to their proximity to public beaches, recreational areas, drinking water supplies or shellfish beds; or are considered by Holyoke to be high priority based on their environmental attributes.
3) Low Priority Outfalls: are considered by Holyoke to be low priority based on existing land uses and their proximity to high priority environmental areas (e.g. densely developed areas that are not proximate to areas with identified environmental attributes).

Excluded outfalls: have no potential for illicit discharges and are 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.

The characteristics used by Holyoke to rank outfalls and their initial priority rankings are included in Table 5-1.

5.2 Outfall Catchment Delineations

A catchment is the area that drains to an outfall or interconnection. Catchment delineations define the contributing areas for investigations of potential sources of illicit discharges. Delineations are based on topographic maps (USGS Springfield North Quadrangle, Massachusetts, 7.5 minute, 2018 and Mount Tom Quadrangle, Massachusetts, 7.5 minute, 2018) and mapped drainage infrastructure. Initial catchment delineations are completed as part of Phase I mapping by June 30, 2020 and refined delineations are completed as part of Phase II mapping.

TABLE 5-1

MS4 OUTFALL AND INTERCONNECTION PRIORITIZATION

Outfall ID / Receiving Water		Likely Sewer Input[1]	Public Health Concern[2]	Past Discharge Complaints	Receiving Water Quality[3]	Density of Generating Sites[4]	Age of Development/ Infrastructure[5]	Historic Combined Sewers or Septic[6]	Aging Septic[7]	Local Priority	Culverted Streams[8]	Additional Characteristics	Score	Priority Ranking
Information Source		**IDDE inspection sample results**	**GIS Maps**	**Town Staff**	**Impaired Waters List**	**Land Use/ GIS Maps, aerial photo**	**Land Use Information, Visual Observation**	**Town Staff, GIS Maps**	**Land Use Town Staff**	**Town Staff**	**GIS &Storm System Maps**	**Other**		
Scoring Criteria	**Map Book**	**Yes = 3 No = 0**	**Yes = 3 No = 0**	**Frequent = 3 Occasional = 2 None = 0**	**Poor= 3 Fair = 2 Good = 0**	**High = 3 Low = 1**	**High = 3 Medium = 2 Low = 1**	**Yes = 3 No = 0**	**Yes = 3 No = 0**	**High = 3 Low = 1**	**Yes = 3 No = 0**	**TBD**		
2 wetlands affiliated with Pequot Pond	B11	0	3	0	2	1	2	0	3	3	0	Lawns, septic, pools	11	HIGH
3 wetlands affiliated with Pequot Pond	A11	0	3	0	2	1	2	0	3	3	0	Lawns, septic, pools	11	HIGH
4 wetlands affiliated Schoolhouse Brook	G1	0	0	0	NA	3	2	0	NA	3	0	Commercial	8	LOW
24 wetlands affiliated Schoolhouse Brook	H4	0	0	0	NA	3	2	0	NA	3	0	Commercial	8	LOW
25 wetlands affiliated Schoolhouse Brook	H4	0	0	0	NA	3	2	0	NA	3	0	Commercial	8	LOW
26 wetlands affiliated Schoolhouse Brook	H4	0	0	0	NA	3	2	0	NA	3	0	Commercial	8	LOW
88 wetlands affiliated Schoolhouse Brook	G1	0	0	0	NA	3	2	0	NA	3	0	Runoff from mall, commercial	8	LOW
89 wetlands affiliated Schoolhouse Brook	H3	0	0	0	NA	3	2	0	NA	3	0	Runoff from mall, commercial	8	LOW
128 wetlands affiliated Schoolhouse Brk	H2	0	0	0	NA	3	2	0	NA	3	0	Runoff from Baystate Medical Center	8	LOW
129 wetlands affiliated Schoolhouse Brk	H2	0	0	0	NA	3	2	0	NA	3	0	Runoff from Baystate Medical Center	8	LOW
130 wetlands affiliated Schoolhouse Brk	H2	0	0	0	NA	3	2	0	NA	3	0	Runoff from Baystate Medical Center	5	LOW
131 wetlands affiliated Schoolhouse Brk	G3	0	0	0	NA	3	2	0	NA	3	0	Confirmed outfall	8	LOW
5 Tannery Brook	I4	0	0	0	NA	3	2	0	NA	1	0	Runoff from mall	6	LOW
6 Tannery Brook	I2	0	0	0	NA	3	2	0	NA	1	0	Mall /Mercy Hospital	6	LOW
9 Tannery Brook	G11	0	0	0	NA	3	2	0	NA	1	0	Residential and commercial	6	LOW
27 Tannery Brook	I6	0	0	0	NA	3	2	0	NA	1	0	Residential and commercial	6	LOW
94 Tannery Brook	H6	0	0	0	NA	1	2	0	NA	1	0	Parking lots and residential	4	LOW
95 Tannery Brook	H6	0	0	0	NA	1	2	0	NA	1	0	Parking lots and residential	4	LOW
96 Tannery Brook	I7	0	0	0	NA	3	2	0	NA	1	0	Residential and Commercial	6	LOW
97 Tannery Brook	I7	0	0	0	NA	3	2	0	NA	1	0	Residential and Commercial	6	LOW
29 Green Brook	F25	0	0	0	NA	1	2	0	NA	1	0	Residential	4	LOW
30 Green Brook	F25	0	0	0	NA	1	2	0	NA	1	0	Residential	4	LOW
31 Green Brook	H24	0	0	0	NA	1	2	0	NA	1	0	Residential	4	LOW
37 Green Brook	J23	0	0	0	NA	1	2	0	NA	1	0	Field check to confirm all 3 are outfalls	4	LOW
38 Green Brook	J23	0	0	0	NA	1	2	0	NA	1	0	Field check to confirm all 3 are outfalls	4	LOW
39 Green Brook	J23	0	0	0	NA	1	2	0	NA	1	0	Field check to confirm all 3 are outfalls	4	LOW
82 Green Brook	G25	0	0	0	NA	1	1	0	NA	1	0	Residential	3	LOW
137 Green Brook	H24	0	0	0	NA	1	2	0	NA	1	0	Residential	4	LOW
12 Connecticut River	J4	0	0	0	2	3	3	3	NA	3	0	This area was separated in 2012	14	HIGH
19 Connecticut River	K7	0	0	0	2	1	2	0	NA	3	0		8	HIGH
43 Connecticut River-Log Pond Cove	M23	0	0	0	2	1	2	3	NA	3	0	Drainage line carries drainage from I- 91.	11	HIGH
78 Connecticut River (2nd level canal)	N17	0	0	0	2	1	3	3	NA	3	0		12	HIGH
79 Connecticut River (1st level canal)	O19				2	1			NA	3	0		6	HIGH
81 Connecticut River (2nd level canal)	O19	0	0	0	2	3	3	0	NA	3	0		11	HIGH
98 Connecticut River	N13	0	0	0	2	3	3	0	NA	3	0	This is drainage for I-391 & main St.	11	HIGH
121 Connecticut River	E32	0	0	0	2	1	1	0	3	3	0	Confirmed outfall	10	HIGH
122 Connecticut River	E31	0	0	0	2	1	2	3	0	3	3	Confirmed outfall	11	HIGH
123 Connecticut River	E31	0	0	0	2	1	2	3	0	3	0		11	HIGH
124 Connecticut River	K10	0	0	0	2	1	3	3	NA	3	0		12	HIGH
125 Connecticut River	K9	0	0	0	2	3	3	3	NA	3	0		14	HIGH
126 Connecticut River	K8	0	0	0	2	3	3	3	NA	3	0		14	HIGH
138 Connecticut River	Q18	0	0	0	2	3	3	3	NA	3	0	This area was separated 2003	14	HIGH
34 unnamed tributary /wetland	G24	0	0	0	NA	1	2	0	NA	1	0		4	LOW
133 Unnamed Tributary to Tannery Brook	H10	0	0	0	NA	1	2	0	NA	1	0		4	LOW
Potential Outfall 10	I10	0	0	0	NA	1	2	0	NA		0	This is on ISO NE property		

TABLE 5-1 (cont'd)

MS4 OUTFALL AND INTERCONNECTION PRIORITIZATION

Notes:

1. Previous screening results indicate likely sewer input if any of the following are true:
   - 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
2. Outfalls and interconnections discharging to or in the vicinity of any of the following: public beaches, recreational areas, drinking water supplies, or shellfish beds.
3. Receiving water quality based on latest version of MassDEP Integrated List of Waters;
   - Poor = Waters with approved TMDLs (Category 4a Waters) where illicit discharges have the potential to contain the pollutant identified as the cause of the impairment; also, waters exceeding the water quality standards for bacteria; ammonia >0.5 mg/L; surfactants ≥0.25 mg/L
   - Fair = Water quality limited waterbodies that receive a discharge from the MS4 (Category 5 Waters)
   - Good = No water quality impairments
4. Generating sites are institutional, municipal, commercial, or industrial sites with a potential to generate pollutants that could contribute to illicit discharges (e.g., car dealers, car washes, gas stations, garden centers, and industrial manufacturing areas).
5. Age of development and infrastructure: High = developments with stormwater and sewer infrastructure > 40 years old; medium = developments with infrastructure 20-40 years old; Low = developments with infrastructure <20 years old.
6. Historic Combined Sewers or Septic: Yes = Areas once served by combined sewers that have been separated, or areas once served by septic that have converted to sanitary sewers.
7. Aging septic systems: Yes = septic systems 30 years or older in residential areas.
8. Local Priority due to Environmental Qualities of the area and land use development.
9. Any river or stream that is culverted for distance greater than a simple roadway crossing.

6.0 DRY WEATHER OUTFALL AND INTERCONNECTION SCREENING AND SAMPLING

Dry weather flow is a common indicator of potential illicit connections. Suez inspects and screens outfalls and interconnections in accordance with their priority ranking and the IDDE Program Timeline (Table 1-2).

6.1 Weather Conditions

To ensure that sampling occurs during dry weather conditions, screening and sampling takes place when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and during times when there is no significant snow melt.

6.2 Screening Requirements

Screening data is included in the outfall/ interconnection inventory and is used to set and update priority rankings. For every outfall and interconnection, the following data is collected, and data recorded on paper or on digital forms:

- Unique identifier
- Receiving water
- Date of most recent inspection
- Dimensions and shape
- Material (concrete, PVC)
- Spatial location (latitude and longitude within +/- 30 feet)
- Physical condition (vegetation and damage to outfall structures)
- Visual/olfactory evidence of non-stormwater discharge (evidence of flow, odor, color, turbidity, floatables (suds, toilet paper, or sanitary products), deposits, oil sheen

6.2.1 Access

If the outfall or interconnection is submerged, Suez inspects the first accessible upstream manhole or structure and notes the location in the screening results.

6.2.2 Confirmation of Illicit Discharge

If no flow is observed but evidence of illicit flow exists, observations are recorded, and a second dry weather inspection is scheduled to take place within one week, if practical. During the second inspection, a second screen is completed and observed flows are sampled.

6.2.3 Sample Collection

At least one (1) sample of dry weather flow is collected and analyzed for: ammonia, chlorine, conductivity, salinity, *E. coli* bacteria, surfactants (such as MBAS), and pollutants of concern (*E. Coli* in the Connecticut River and *Enterococcus* in Pequot Pond). Table 6-1 includes field equipment commonly used for outfall screening and sampling. Table 6-2 summarizes tests performed for each analyte and indicates whether they are done in the field or sent to an outside laboratory.

TABLE 6-1

FIELD EQUIPMENT

Equipment	Use/Notes
Covered Metal Clipboard	For organization/ protection of field sheets and writing surface
Field Sheets	Field sheets for both dry weather inspection and Dry weather sampling should be available with extra copies
Chain of Custody Forms	To ensure proper handling of all samples
Pens/Pencils/Permanent Markers	For proper labeling
Nitrile Gloves	To protect the sampler and prevent sample from contamination
Flashlight/headlamp w/batteries	For inspecting outfalls or manholes
Cooler with Ice	For transporting samples to the laboratory (see sample holding requirements)
Digital Camera	For documenting field conditions at time of inspection
Personal Protective Equipment (PPE)	Reflective vest, safety glasses, nitrile gloves and boots, steel toed shoes
GPS Receiver	For record spatial location data
Water Quality Sonde	If needed, for sampling conductivity, temperature, pH
Water Quality Meter(s)	Hand held meters for testing for various water quality parameters such as ammonia, surfactants and chlorine
Test Kits	Have extra kits on hand to sample more outfalls than are anticipated to be screened in a single day
Label Tape	For labeling sample containers
Sample Containers	Make sure all sample containers are clean and keep extra sample containers on hand at all times. Confirm sample containers are appropriate for what is being sampled for (i.e., sterile containers for bacteria).
Pry Bar or Pick	For opening catch basins and manholes
Sandbags	For damming low flows to collect water for sampling
Small Mallet or Hammer	To free stuck manhole and catch basin covers
Utility Knife	Multiple uses
Measuring Tape	Measuring distances and depth of flow
Safety Cones	To clearly mark areas where samplers are present
Hand Sanitizer	To disinfect hands and nitrile gloves especially prior to collecting samples for bacterial analysis
Zip Ties/Duct Tape	For making field repairs
Rubber Boots/Waders	For accessing shallow streams/areas
Sampling Pole/Dipper/Sampling Cage	For accessing hard to reach outfalls and manholes

TABLE 6-2

SAMPLING PARAMETERS AND ANALYSIS METHODS

Analyte or Parameter[1]	Instrumentation (portable meter)	Field Test Kit
Ammonia		
Chlorine (residual)	Hach™ Pocket Colorimeter™ II	
Conductivity		
Salinity		
E. coli (freshwater)	Sent to in-house lab	Colilert sample containers
Enterococcus (saline or brackish)	Sent to in-house Lab	Colilert sample containers
Surfactants (e.g. MBAS)		
Temperature		

Notes:

[1] 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.

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

TABLE 6-3

REQUIRED ANALYTICAL METHODS, DETECTION LIMITS, HOLD TIMES, AND PRESERVATIVES

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Ammonia	**U.S.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
Chlorine	**SM**: 4500-Cl G	0.02 mg/L	Analyze within 15 minutes	None Required
Temperature	**SM**: 2550B	*NA*	Immediate	None Required
Specific Conductance	**U.S.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* **U.S.EPA** : 1603 **SM**: 9221B, 9221F , 9223 B **Other**: Colilert ®, Colilert-18® *Enterococcus* **U.S.EPA** : 1600 **SM**: 9230 C **Other**: Enterolert®	*E.coli* **U.S.EPA** : 1 cfu/100mL **SM**: 2 MPN/100mL **Other**: 1 MPN/100mL *Enterococcus* **U.S.EPA** : 1 cfu/100mL **SM**: 1 MPN/100mL **Other**: 1 MPN/100mL	8 hours	Cool ≤10°C, 0.0008% $Na_2S_2O_3$
Total Nitrogen (Ammonia + Nitrate/Nitrite, methods are for Nitrate-Nitrite and need to be combined with Ammonia listed above.)	**U.S.EPA** : Cadmium reduction (automated)-353.2 Rev. 2.0, **SM**: 4500-NO_3 E-F	**U.S.EPA** : 0.05 mg/L **SM** : 0.05 mg/L	28 days	Cool ≤6°C, H_2SO_4 to pH <2

6.3 Interpreting Outfall Sampling Results

Outfall analytical data from dry weather sampling can be used to help identify the major type or source of discharge. Screening values that exceed these benchmarks indicate the presence of pollution and/or illicit discharges.

TABLE 6-4

BENCHMARK FIELD MEASUREMENTS FOR SELECT PARAMETERS

Analyte or Parameter	Benchmark
Ammonia	>0.5 mg/L
Conductivity	>2,000 µS/cm
Surfactants	>0.25 mg/L
Chlorine	>0.02 mg/L
Indicator Bacteria[2]: *E.coli* *Enterococcus*	*E.coli*: for beach monitoring, 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 *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

6.4 Follow-up Ranking of Outfalls and Interconnections

Suez updates outfall and interconnection priority rankings (Table 5-1) based on information gathered during dry weather screening. Outfalls or interconnections are placed at the top of the priority list when investigations or sampling results indicate there is a highly likelihood that they illicit discharges from sanitary sources are entering stormwater.

[2] Massachusetts Water Quality Standards: http://www.mass.gov/eea/docs/dep/service/regulations/314cmr04.pdf

7.0 CATCHMENT INVESTIGATIONS

The MS4 permit requires catchment investigations for outfalls and/or interconnections begin no later than June 30, 2020, and that all catchments affiliated with problem outfalls be investigated by June 30, 2025. Catchment investigations affiliated with all the other high and low priority outfalls must be completed by June 30, 2028. Catchment investigation techniques include but are not limited to review of maps, historic plans, and records. This section of the IDDE describes the catchment investigation procedure to investigate outfall catchments to trace the source of potential illicit discharges. Data collected during catchment investigations will be recorded and reported in each annual report. Infrastructure information gathered during catchment investigations shall be incorporated into the MS4 maps.

7.1 System Vulnerability Factors (SVF)

Each catchment investigation includes reviewing maps, historic plans and records to identify areas within the catchment that have a higher potential for illicit connections due to SVFs. Specifically, the following information is 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
- Compliant records relating to SSOs
- Septic system breakouts

Infrastructure information for each catchment is documented and incorporated into the MS4 maps and is used to refine catchment delineations. The SVF inventory for catchments is updated based on information obtained during inspections.

The presence of any of the following SVFs will be identified for each catchment.

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages;
- Common or dual-invert manholes serving storm and sanitary sewer alignments;
- Common trench construction serving both storm and sanitary sewer alignments;
- Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system;

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

All outfalls, their receiving waters, and SVF ratings are in Table 7-1.

TABLE 7-1

OUTFALL CATCHMENT SYSTEM VULNERABILITY FACTOR (SVF) INVENTORY

Outfall ID	Receiving Water	History of SSOs[1]	Common or Twin Invert Manholes	Common Trench Construction[2]	Storm/ Sanitary Crossings[3]	Sanitary Lines with Underdrains	Inadequate Level of Service[4]	Areas Formerly Served by Combined Sewers	Sanitary Infrastructure Defects[5]	SSO Potential[6]	Sanitary / Storm Drain Infrastructure >40 years Old	Septic with Poor Soils or Water Table Separation	Septic system upgrades or system failure[7]
2	Wetlands affiliated with Pequot Pond												
3													
4	Schoolhouse Brook or wetlands or tributaries affiliated with Schoolhouse Brook												
24													
25													
26													
88													
89													
128													
129													
130													
131													
5	Tannery Brook												
6													
9													
27													
94													
95													
96													
97													
29	Green Brook												
30													
31													
37													
38													
39													
82													
137													
12	Connecticut River												
19													

TABLE 7-1 (cont'd)

OUTFALL CATCHMENT SYSTEM VULNERABILITY FACTOR (SVF) INVENTORY

Outfall ID	Receiving Water	History of SSOs[1]	Common or Twin Invert Manholes[2]	Common Trench Construction[3]	Storm/ Sanitary Crossings[4]	Sanitary Lines with Underdrains[5]	Inadequate Level of Service[6]	Areas Formerly Served by Combined Sewers[7]	Sanitary Infrastructure Defects[8]	SSO Potential[9]	Sanitary / Storm Drain Infrastructure >40 years Old[10]	Septic with Poor Soils or Water Table Separation[11]	Septic system upgrades or system failure[12]
43	Log Cove Pond												
78	Connecticut River												
79													
81													
98													
121													
122													
123													
124													
125													
126													
138													
34	Unnamed Tributary												
133													
10	Outfalls requiring field inspection to verify whether they are true outfalls												
11													
7													
8													
90													
91													
15													
16													
17													
22													
23													
50													
92													
93													

Notes:

1 Including, but not limited to SSOs resulting from wet weather, high water table, or fat/oil/grease blockage.

2 Common or twin-invert manholes serving storm and sanitary sewer alignments.

3 Trench construction serving both storm and sanitary sewer alignments.

4 Crossing of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system.

5 Sanitary sewer alignments known or suspected to have been constructed with an underdrain system.

6 Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints.

7 Areas formerly served by combined sewer systems.

8 Sanitary sewer infrastructure defects such as leaking laterals, cracked, broken or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through inflow/Infiltration Analysis, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations.

9 Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs.

10 Any sanitary sewer and storm drain infrastructure greater than 40 years old.

11 Areas of widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor maintenance).

12 History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance).

7.2 Dry Weather Manhole Inspections

Suez conducts dry weather investigations of the storm drain network. Investigations involve systematically and progressively observing, sampling, and evaluating key junction manholes, defined as follows:

- **Junction Manhole** is a manhole or structure with two or more inlets accepting flow from two or more MS4 alignments. Manholes with inlets that are only from private storm drains, individual catch basins, or both are not considered junction manholes for these purposes.
- **Key Junction Manholes** can represent one or more junction manhole without compromising adequate implementation of the illicit discharge program. Adequate implementation of the IDDE 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. Suez may exclude a junction manhole located upstream and in the immediate vicinity from another manhole, or one that serves a drainage alignment that has no potential for illicit connections.

For all catchment requiring investigation during dry weather, Suez systematically inspects key junction manholes for evidence of illicit discharges. The program requires progressive inspection and sampling at manholes to find evidence of illicit discharges and to isolate and eliminate them. Suez's inspections are conducted in one of two ways (or a combination of both):

- Working progressively up from an outfall and inspecting key junction manholes along the way, and/or
- Working progressively down from the upper parts of the catchment towards the outfall.

The decision to work up or down the system depends on the nature of the drainage system, the 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 discharged are believed to be located in the upstream portions of the catchment area.

Inspection of key junction manholes includes the following steps:

1) Manholes are opened and inspected for visual and olfactory evidence of illicit connections (toilet paper, gray filamentous bacterial growth, sanitary products, etc.). A sample field inspection form is in Appendix C.

2) If flows are observed, a sample is collected and analyzed at a minimum for ammonia, chlorine, and surfactants. Additional indicator sampling to determine potential sources may include sampling bacteria for sanitary flows, conductivity tidal backwater, etc.)

3) If sampling results or visual or olfactory observations indicate potential illicit discharges or SSOs, Suez flags the area draining to the junction manhole for further upstream investigation and/or isolation and confirmation of sources.

4) Additional key junction manhole inspections will proceed until the location of the suspected illicit discharge(s) or SSO(s) are located and isolated to a pipe segment between two manholes.

5) If no evidence of an illicit discharge is found, the catchment investigation is complete upon completion of key junction manhole sampling.

7.3 Wet Weather Outfall Sampling

In catchments that have a minimum of one (1) SVF are screened during wet weather conditions. Suez inspects and samples these catchments to the extent necessary to determine whether wet weather-induced high flows in sanitary sewers or high ground water in areas served by septic systems results in discharges of sanitary flows to the MS4. Catchment investigations are not considered to be completed until any wet weather inspections are done.

Suez times its sampling events to avoid sampling during the first flush, and schedules wet weather sampling to occur during the spring (March to June) when groundwater levels are high.

Suez collects at least one (1) wet weather sample and has it analyzed for: ammonia, chlorine, conductivity, salinity, *E. coli,* surfactants (such as MBAS), and pollutants of concern (nitrogen, if discharge directly flows to the Connecticut River).

7.4 Source Isolation and Confirmation

Once Suez has approximated the source of an illicit discharge to be between two manholes, Suez employs a range of techniques to isolate and confirm the source of the discharge that may include:

7.4.1 Sandbagging

This technique is used to identify and isolate intermittent sources of illicit discharge, or sources having little perceptible flow. Sandbagging involves placing sandbags or other temporary barriers (caulking, weirs/plates, etc.) within outlets to manholes to form a temporary dam that collects any intermittent flows that may occur. The bags and barriers are only deployed during dry weather conditions and typically left in place for 48 hours. If water collects behind the barrier 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 intermittent discharge.

7.4.2 Smoke Testing

Smoke testing is used on short sections of pipes or pipes with small diameters. It is used to trace illegal connections from buildings to the sewer. Smoke testing involves injecting non-toxic smoke into drain lines and the emergence of smoke from sanitary sewer vents in or from cracks and leaks in the system. Typically, a smoke bomb or smoke generator is used to inject smoke into a catch basin or manhole.

Before conducting any smoke testing, Suez notifies area residents, business owners, and local police and fire departments. Smoke can cause minor irritation of respiratory passages. Residents with respiratory conditions may need to be monitored or evacuated from the area of testing altogether to ensure safety during testing.

7.4.3 Dye Testing

Dye testing involves flushing non-toxic die into plumbing fixtures (toilets, showers, sinks) and observers standby at nearby storm drains, sewer manholes, and outfalls. Before dye testing is done, Suez notifies area residents, business owners, the local police and fire departments as well as public health staff. Dye testing is done by a team of two or more with one person stationed inside the building, while others are stationed at the appropriate storm sewer and sanitary sewer manhole and/or outfall. The person inside the building adds dye into a plumbing fixture (sink or toilet) and runs water to move the dye through the system. Employees stationed outside are notified that the dye has been dropped and watch for the dye in the storm sewer and sanitary sewer.

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 Video Inspections

Video inspections use mobile video cameras that are guided remotely through the stormwater drain lines to observe possible illicit discharges.

7.4.5 Optical Brightener Monitoring

Optical brighteners are fluorescent dyes that are used in detergents and paper products. The presence of optical brighteners in surface waters or dry weather discharges indicates a possible illicit discharge or insufficient wastewater treatment at nearby septic systems or wastewater treatment plants. Optical brightener monitoring involves placing a cotton pad in a wire cage and securing the cage in a pipe, manhole, catch basin, or inlet to capture intermittent dry weather flows. The pad is collected and viewed with a UV light or with a fluorometer to determine the presence or absence of brighteners.

Additional instructions and Standard Operating Procedures (SOPs) for these methods are in Appendix E.

7.5 Illicit Discharge Removal

Once the illicit source is identified, the Suez Area Manager, or Assistant Systems Manager contacts the City Superintendent of Public Works. The City Superintendent, in accordance with legal authorities, notifies all responsible parties and requires immediate cessation of improper disposal practices. The City and Suez take steps to eliminate the illicit discharge as expeditiously as possible. While the illicit discharge is being eliminated, the City takes all reasonable and prudent steps to minimize the discharge of pollutants to the MS4.

When an illicit discharge cannot be removed within 60 days of being identified, the City creates a schedule for elimination and report dates and schedules for removal in the annual report.

For each confirmed source, Holyoke documents the following information in its Annual Report:

- Location of ID and its source(s);
- A description of the discharge;
- The method of discovery;
- The date of discovery;
- The date of elimination, mitigation or enforcement action or planned corrective measure and a schedule for completing the ID removal; and
- The estimate of the volume of flow removed.

7.5.1 Confirmatory Outfall or Interconnection Screening

Within one (1) year of removal of all identified illicit discharges within a catchment area, confirmatory outfall or interconnection screening shall be conducted. If confirmatory screening indicates evidence of additional illicit discharges, the catchment shall be scheduled for additional investigation. Catchments investigations are considered complete upon confirmation of all illicit sources.

7.5.2 Ongoing Screening:

Once Suez has completed catchment investigations and has eliminated illicit discharges and confirmed their removal (if necessary), each outfall or interconnection will be reprioritized for screening once every five years. Ongoing screening consists of dry weather screening and sampling, and wet weather screening and sampling for outfalls where wet weather screening was required due to SVFs.

8.0 **TRAINING**

Suez provides annual IDDE training to all employees who are involved in the IDDE program. At a minimum training includes how to identify illicit discharges and SSOs. Training records are maintained in Appendix F. The frequency and type of training is included in the annual report.

9.0 **ANNUAL REPORT**

Holyoke and Suez evaluate the progress of their IDDE Program on an annual basis. This evaluation is documented in the annual report and includes:

- Number of SSOs and Illicit discharges identified and removed
- Number and percent of total outfall catchments served by the MS4 that have been evaluated using the catchment investigation procedure
- Number of dry weather outfall inspections/ screenings
- Number of wet weather outfall inspections/ sampling events
- Number of enforcement notices issued
- All dry weather and wet weather screening and sampling results
- Estimates of the volume of stormwater removed
- Number of employees trained annually

APPENDIX A

LEGAL AUTHORITY

SME
SEVEE & MAHER
ENGINEERS

APPENDIX B

MS4 MAPS

SME
SEVEE & MAHER
ENGINEERS

APPENDIX C

FIELD FORMS, SAMPLE BOTTLE LABELS, CHAIN OF CUSTODY FORMS

SME
SEVEE & MAHER
ENGINEERS

APPENDIX D

USER MANUALS

SME
SEVEE & MAHER
ENGINEERS

APPENDIX E

SOURCE ISOLATION AND CONFIRMATION METHODS: INSTRUCTIONS, MANUALS, AND SOPS

SME
SEVEE & MAHER
ENGINEERS

APPENDIX F

IDDE EMPLOYEE TRAINING RECORD

SME
SEVEE & MAHER
ENGINEERS

HR-001 Training Documentation Form

Please complete the form in its entirety.
All participant names on the Training Documentation Form must be entered into the Talent Up system for accurate employee attendance tracking.
All hard copies of the completed Training Documentation Forms must be kept on site for a minimum of five years.

Title of Training Session (Exactly as Titled in Talent Up if Talent Up Course): Illicit Discharge Detection and Elimination Program	**Training Course # (if applicable):**	**Training BU/ Project Location (please include address if applicable):** Holyoke, MA	
Name of BU/Project Training Coordinator: Jason Swain	**Date of Training:** 9/4/2020	**Time (e.g. 8am-4pm):** 11:45 am	**Duration (hours):** 0.75 hrs
Training Instructor: ☐ Talent Up ☑ Internal ☐ External	**Instructor Name:** Jason Swain	**Vendor/Consultant Name and Company (if applicable):**	
CEU (if applicable):	**Reason for Training (check all that apply):** ☐ New Information ☐ Recertification ☑ Refresher ☐ Skill Development ☐ Regulatory Requirement ☑ Tailgate Training		
Training Materials and Outline Used (i.e. PowerPoint, Hands On, YouTube Video, etc): Classroom			

Participants

#	Employee SUEZ ID	Employee Green ID for Talent Up	Employee Name (Type In Name)	Employee Signature
1	1176773	BC5715	Jesse Danek	
2	1173518	ZV5701	Henry Duval	
3	1178114	BC5718	Dennis Flores	
4	1178062	FIH361	Rolanda Joseph	
5	1173551	ZM5704	Richard LaFlamme	
6	1178423	BC5719	Joaquin Lorenzana	
7	1175073	CZ5220	Kevin Lukasiewicz	
8	1178114	BC5712	Tony Orefice	
9	1173581	IDJ328	Joseph Pease	

Title of Training Session: Illicit Discharge Detection and Elimination Program			Date: 9/4/2020	BU/Project Location:: Holyoke, MA
#	Employee SUEZ ID	Employee Green ID	Employee Name (Type in Name)	Employee Signature
10	1178365	ZM5706	Oswaldo Pedrosa	
11	1178880	RWA170	Nicholas Robinson	
12	1178827	RJ5752	Tyler Schofield	
13	1173600	ZM5705	Bernard Smyth	
14	1176560	VUA060	Jason Swain	
15	1178412	NG5540	Scott Urban	
16	1175907	YOA113	Michael Williams	
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				