Illicit Discharge Detection and Elimination (IDDE) Report

Permit Year 6

PREPARED FOR

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Executive Summary

This Illicit Discharge Detection and Elimination (IDDE) Report for Permit Year 6 (July 1, 2023-June 30, 2024) has been developed by VHB for the Massachusetts Department of Conservation and Recreation (DCR) to track progress towards the requirements of the United States Environmental Protection Agency's (EPA) 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereafter referred to as the "2016 Massachusetts MS4 Permit" or "MS4 Permit." This report documents the progress of the IDDE program, developed to fulfill Minimum Control Measure 3 of the MS4 Permit. The goal of the IDDE program is for DCR to systematically identify and eliminate sources of non-stormwater discharges to its storm sewer system and implement procedures to prevent such discharges.

Activities under the IDDE program include the screening of regulated outfalls[1], catchment investigations, and illicit discharge removal. During this permit year, the Project Team of VHB and subconsultant Stacy DePasquale Engineering, Inc (SDE) completed the following IDDE program tasks:

- regulated outfall screening in dry and wet weather,

[1] "regulated outfalls" refers to both outfalls and interconnections included in DCR's Outfall/Interconnection inventory pursuant to the MS4 permit part 2.3.4.7.a.i.

- catchment investigation screening and sampling for High priority outfalls, and
- desktop analysis and follow-up catchment investigation field work (e.g., dye testing and illicit discharge removal) focused on Problem and Highest priority outfalls.

Table 1 summarizes the screening conducted in Permit Year 6. The Project Team identified six illicit discharges in Permit Year 6 and removed one illicit discharge which was identified in Permit Year 5. DCR is actively working on actions to remove the six illicit discharges newly identified and each of them require coordination with private property owners, municipalities, or other entities to remove and properly close. The anticipated actions are detailed in Section 4.

Table 1 Permit Year 6 Screening and Sampling Summary

Screening Activity	Details	Permit Years 1 - 5	Permit Year 6	Total
	Regulated Outfalls Included in IDDE Program	-	-	1,461[1]
Dry Weather	Regulated Outfalls Screened	1,282[2]	82	1,364
Wet Weather	Regulated Outfalls Screened	15	43	58
Illicit Discharges	Potential Illicits Identified	3	6	9
	Illicit Discharges Removed	2	1	3
	Gallons of Sewage Removed per Day[3]	*15*	*15*	*30*

Notes:

1 – The number of regulated outfalls continues to be updated as field work and desktop review identify additional outfalls and interconnections or changes to the regulated status of an outfall or interconnection.

2 – The number of regulated outfalls screened prior to Permit Year 6 decreased from the 1,299 reported in Permit Year 5 due to some outfalls that were previously screened being reclassified as non-regulated in Permit Year 6 due to additional data and mapping updates.

3 – When sewer is identified as the source of the illicit discharge, the gallons of sewage removed per illicit discharge per day is estimated using the equation detailed in Section 4. Illicit discharges with an unknown quantity of sewage removed or those where sewer is not the source of the illicit discharge are excluded from theses calculations.

As required by the permit, each regulated outfall was assigned a prioritization category - problem, high, low, or excluded[2] - as part of the Year 1 update to the IDDE plan. In order to update priorities prior to performing catchment investigations, these categories were reviewed to reflect results from this year's sampling. Regulated outfalls where dry weather sampling results indicated likely sewer inputs are ranked at the top (Highest) of the High priority outfalls category for investigation. **Table 2** summarizes the Year 6 update of the outfall prioritization.

[2] The terms "Problem outfalls," "Highest priority outfalls," "High priority outfalls," and "Low priority outfalls" refer to both outfalls and interconnections included in DCR's Outfall/Interconnection inventory pursuant to the MS4 permit part 2.3.4.7.a.i.

Table 2 Regulated Outfall Prioritization

Prioritization Category	# of Regulated Outfalls
Problem	21[1]
High (Highest)	18
High	1,295
Low	127
Total in the IDDE Program[3]	*1,461*
Excluded	216[2]
Total	1,677

1 – The number of Problem outfalls increased from 20 in Permit Year 5 due to updated mapping information. One problem catchment was discovered to drain to two independent outfalls.

2 – The number of Excluded outfalls decreased from 222 in Permit Year 5. Due to updated mapping information in Permit Year 6, several outfalls that were defined as regulated and categorized as "Excluded" in Permit Year 5 now do not meet the regulated criteria under the MS4 permit.

In Permit Year 6, VHB and SDE focused on completing investigations on regulated outfalls that were identified as Problem and Highest priority and on making steady progress on High priority outfall investigations (**Table 3**). Actions taken on Problem and Highest priority outfall investigations primarily included desktop analysis (e.g., record planset and sanitary sewer mapping review), coordination with municipalities, dye testing, CCTV, confirmatory screening, and drainage structure and pipe lining work. These are discussed in greater detail in Section 3 of this report. Actions taken on High priority outfalls primarily included initial dry weather investigations.

Table 3 Catchment Investigations Completed

Prioritization Category	Total	In Progress	Permit Year 6 Completed	Total Completed	% Investigations Complete
Problem	21	10	6	11	52%
Highest	18	8	7	8	44%
High	1,295	206	177	184	14%
Low	127	17	18	19	15%

This year, VHB continued efforts to fine tune field workflows and data quality assurance protocols to prepare for larger field work tasks once the Problem and Highest priority outfalls are addressed.

DCR will continue to focus on Problem and Highest priority outfalls in Permit Year 7 to meet the Permit Year 7 deadline pursuant to the MS4 permit part 2.3.4.8.a and to expeditiously address the potential of illicit discharges in these catchments. DCR will also continue to follow up on potential illicit discharges that are identified outside the scope of the IDDE

screening and sampling including those identified from public reports and those reported by DCR staff during regular drainage asset inspection and maintenance.

2

Regulated Outfall Screening

In accordance with the MS4 Permit part 2.3.4.7.b, DCR must screen all regulated outfalls during dry weather conditions and use the results of the screening to develop an outfall ranking priority order and catchment investigation completion schedule for screening regulated outfalls. The regulated outfall screening in Permit Year 6 focused on completing dry weather screening[3] for regulated outfalls that had not been mapped in the previous year and regulated outfalls where follow-up from previous years was required (e.g., regulated outfalls that could not be located, accessed, and/or sampled when initially visited).

DCR then ranked the regulated outfalls as Problem, High priority, Low priority, or Excluded to update the regulated outfall ranking. DCR previously added the Highest priority sub-category to the High priority category to allow DCR to better track the regulated outfalls with screening results indicating the need for more immediate attention. Due to the statewide nature of the regulated outfalls, DCR has developed a web map[4] to show the location of the areas investigated and the web map includes the field and lab sample results for the regulated outfalls with dry weather flow (for more information on regulated outfall-specific locations, please contact DCR Stormwater Unit).

[3] Dry weather flow is defined as flow occurring when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring.

[4] IDDE Report Webmap address: https://vhb.maps.arcgis.com/apps/webappviewer/index.html?id=87a35a2683aa4478a07ade7ffb7c1b2a

2.1 Dry Weather Screening and Sampling

The permit's initial goal of outfall screening was to identify regulated outfalls with dry weather flow, sample for the required parameters, and review the priority ranking of the outfall based on sampling results. While dry weather screening of known regulated outfalls on DCR regulated properties was completed to meet the Permit Year 3 deadline, DCR has continued to identify interconnections and map outfalls, and therefore has performed additional screening this year. **Table 3** summarizes the status of the dry weather screening.

Table 3 Dry Weather Screening and Sampling

	Previously Screened	Permit Year 6 Screening	Total Screened	IDDE Program Outfalls	% of Total Screened
Regulated Outfalls Screened	1,282[1]	82	**1,364**	1,461	94%

1 – The number of regulated outfalls screened prior to Permit Year 6 decreased from the 1,299 reported in Permit Year 5 due to outfalls being reclassified as non-regulated in Permit Year 6 due to additional data and mapping updates.

In accordance with DCR's IDDE Plan procedures developed to meet the requirements in the MA MS4 permit (Part 2.3.4.7.b.iii.4.b), the field teams performed field measurements and collected samples for lab analysis to analyze dry weather flow. Field measurements included ammonia, chlorine, conductivity, salinity, surfactants (detergents), pH, and temperature. Samples were also analyzed for the applicable parameters in the lab based on the MS4 permit requirements, which states that samples shall be analyzed for *Escherichia coli* (E. coli) for outfalls discharging to a freshwater receiving waterbody or *Enterococcus* for a saline or brackish receiving waterbody and the receiving waterbody's pollutant of concern[5].

2.2 Outfall Prioritization Categories Review

The results of dry weather screening must be reviewed and used to update the regulated outfall prioritization categories each year. **Table 4** summarizes the regulated outfall prioritization categories, and the sections below discuss the results in further detail. For regulated outfalls with no dry weather flow and no olfactory or visual evidence of illicit input, the outfall remained in the same priority category unless there was new information regarding the location or ownership of the regulated outfall. If new data indicated that a regulated outfall is either not a DCR-owned outfall, does not exist, or updated mapping precludes it from the IDDE program (e.g., updated mapping indicates that what was once mapped as an MS4 outfall is a cross-culvert outlet), the regulated outfall was removed from the total regulated outfall inventory. For regulated outfalls with dry weather flow, VHB and

[5] Where the discharge is directly into a water quality limited water or a water subject to an approved TMDL as indicated in Appendix F of the MS4 permit; the sample shall be analyzed for the pollutant of concern identified as the cause of the impairment as specified in Appendix G of the MS4 permit.

SDE reviewed the results and recommended next steps based on sampling results, the sewage indicator criteria included in the MS4 permit, and DCR's IDDE plan. This review included determining if a higher priority category was appropriate for the regulated outfall.

Table 4 Regulated Outfall Prioritization

	# of Regulated Outfalls	
Prioritization Category	**Permit Year 5**	**Permit Year 6**
Problem	20	21[1]
Highest	10	18
High	1,222	1,295
Low	126	127
Included in the IDDE Program	*1,378*	*1,461*
Excluded	222	216[2]
Total	1,600	1,677

1 – The number of Problem outfalls increased from 20 in Permit Year 5 due to updated mapping information. One problem catchment was discovered to drain to two independent outfalls.

2 – The number of Excluded outfalls decreased from 222 in Permit Year 5. Several outfalls that were defined as regulated and were prioritized as "Excluded" in Permit Year 5, were found to be not regulated under the MS4 permit due to updated information in Permit Year 6

2.2.1 Problem Outfalls

Fifteen outfalls were identified as Problem outfalls in Permit Year 1 based on historical issues. After reviewing the ownership of these fifteen outfalls in Permit Years 4 and 5, DCR determined that several of these outfalls were municipally owned. As such, DCR re-delineated these Problem outfall catchments to align with DCR's upstream interconnection points. This increased the total number of Problem outfalls from fifteen to twenty-one since DCR is often interconnected upstream of the original Problem outfall in more than one location.

Part 2.3.4.7.b of the MS4 Permit indicates that the permittee should move right to catchment investigations for these regulated outfalls even if they were not dry weather screened. The investigation of ten of these twenty-one regulated outfalls is still ongoing, with eleven being complete, and is discussed in **Section 3, Catchment Investigations**. The catchment investigations and wet weather sampling, if appropriate, needs to be completed within 7 years of the permit effective date (July 1, 2025).[6]

[6] MS4 Permit Part 2.3.4.8.a

2.2.2 Highest Priority Outfalls

Currently, there are eighteen regulated outfalls categorized as Highest priority. The Highest priority category was developed by DCR to reflect where dry weather sampling results met the likely sewer input indicators[7] to prioritize their investigation. Permit Year 6 dry weather screening detected potential olfactory evidence of non-stormwater flow at two outfalls and elevated sampling results that exceeded sewer input indicator thresholds indicated potential illicit flow at a third. Therefore, these outfalls were reprioritized as Highest.

DCR will strive to complete catchment investigation of these Highest priority catchments and perform wet weather sampling, if appropriate, in the same schedule as the Problem outfalls but depending upon when the potential sewer inputs are identified and the complexity of the system an alternative schedule may be needed. See **Section 3.2** for more information.

2.2.3 High Priority Outfalls

The High priority outfalls screened this year, with the exception of the three discussed in Section 2.2.2, either had no flow or results did not indicate elevated concentrations of pollutants. Since they still discharge to receiving waters with specific listed impairments these outfalls will remain classified as High priority. In Permit Year 6, updated data gathered through DCR field visits caused the number of High priority outfalls to increase to 1,295 from the 1,222 reported in Permit Year 5.

DCR is required to complete catchment investigation of High priority catchments and perform wet weather sampling, if appropriate, within 10 years of the permit effective date (July 1, 2028).

2.2.4 Low Priority Outfalls

The Low priority outfalls did not indicate signs of illicit connections. Therefore, these outfalls remain categorized as Low priority. In Permit Year 6, 127 Low Priority outfalls are reported.

Catchment investigations for Low Priority outfalls must be completed within 10 years of the permit effective date (July 1, 2028).

[7] As defined in the MS4 permit, likely sewage input indicators are any of the following:

- Olfactory or visual evidence of sewage,
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine (0.02 mg/L).

2.2.5 Excluded Outfalls

Regulated outfalls with no potential for illicit discharges may be excluded from the IDDE program. The permit identifies that drainage from the following categories below can be excluded:

- 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, or
- Cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.

DCR has identified regulated outfalls that are excluded from the IDDE program as those located away from sanitary sewer systems, in undeveloped areas based on land use, and not in proximity to a DCR building with restrooms. In Permit Year 6, four additional outfalls were either newly mapped or identified as Excluded through desktop analysis. The total number of excluded outfalls reported in Permit Year 6 is 216. DCR will continue to refine excluded outfall status through catchment investigations and desktop analysis.

3

Catchment Investigations

DCR must perform catchment investigations on all non-excluded regulated outfalls as part of the IDDE program. Pursuant to the MS4 permit Part 2.3.4.8.b.ii, the field crews conducted dry weather catchment investigations by opening key junction manholes upstream of the regulated outfalls. If flow was observed in a particular pipe, the flow was sampled in accordance with DCR's IDDE Plan. If there were signs of potential intermittent flow at a pipe, a sandbag was placed for a minimum of 48 hours to capture intermittent flows. In order to complete a catchment investigation, DCR must perform wet weather screening if the catchment includes any System Vulnerability Factors (SVFs) based on previous information or the catchment investigation. DCR has continued to refine its catchment investigation procedures as documented in the IDDE Plan. The dry weather catchment investigation data and wet weather screening data are available in a public web map[8].

Problem outfall investigations must begin within two years and be completed within seven years of the permit effective date. The permit requires that all catchment investigations be completed within ten years of the permit effective date.

In Permit Year 6, effort was split between completing investigations on regulated outfalls that were identified as Problem and Highest priority outfalls and on making steady progress

[8] IDDE Report Webmap address: https://vhb.maps.arcgis.com/apps/webappviewer/index.html?id=87a35a2683aa4478a07ade7ffb7c1b2a

on High priority outfall investigations. DCR was able to complete the investigation of six Problem outfalls in Permit Year 6 and the remaining Problem outfall investigations are ongoing. Catchment investigations, if not yet completed, will proceed based on regulated outfall priority. **Table 5** summarizes the status of the catchment investigations and further detail is provided in the sections below.

Table 5 Catchment Investigations Completed

Prioritization Category	Total	In Progress	Completed Year 6	Completed Total	Completed % Complete	Investigations Complete Due Dates According to Permit
Problem	21	10	6	11	52%	PY7 (July 1, 2025)
Highest	18	8	7	8	44%	PY7 (July 1, 2025) or DCR to set alternate schedule
High	1,295	206	177	184	14%	PY10 (July 1, 2028)
Low	127	17	18	19	15%	PY10 (July 1, 2028)

3.1 Problem Outfalls Catchment Investigations

Before the permit took effect, DCR had identified Problem outfalls in six areas based on historic information or ongoing issues. Catchments associated with these areas were prioritized for investigation with DCR closing more than half of the Problem outfalls by the end of this permit year and making significant strides to determine the necessary steps to close the remaining problem outfalls investigations. The following sections describe each of the areas initially identified with Problem outfalls and describes catchments by the final outfall regardless of whether DCR owns the outfall or instead interconnects upstream of the final outfall for continuity with previous annual reports. For simplicity we have included historical screening and sampling information regarding the investigation but highlighted the work this year.

3.1.1 Stacey Brook (2 outfalls; Investigations complete)

The storm drainage area under review, which is comprised of two outfalls (outfalls 38017 and 37114.1), is located around Stacey Brook in Lynn and Swampscott, MA. Stacey Brook flows underground through a 6-foot culvert and discharges through an outfall on Red Rock Beach and ultimately into Nahant Bay (MA93-24).

Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Stacey Brook 1 (2 interconnections to MH-25416, 2 interconnections to CB-666668502, drains to Outfall 38017)	Complete	Complete	Wet weather screened remaining two interconnection points - no indication of illicit discharges.	Catchment investigation is complete.
Stacey Brook 2 (4 interconnections to MH-25418, 1 blind interconnection downstream of CB-666667101, drains to Outfall 37114.1)	Complete	Complete	Wet weather screening at interconnection points - no indication of illicit discharges.	Catchment investigation is complete.

DCR's drainage network to these outfalls is mostly limited to Lynn Shore Drive, Red Rock Beach, and the landscaped areas between the roadway and beach; it also includes a portion of Eastern Ave and Humphrey Street. DCR's drainage interconnects to outfall 38017, which is owned by Swampscott, at manhole 25416 and at catch basin 666668502. DCR's drainage interconnects to outfall 37114.1, which is owned by Lynn, at manhole 25418 and at a blind connection downstream of catch basin 666667101. These outfalls were flagged as Problem Outfalls based on previous sampling results indicating high bacteria (both *E. Coli* and *Enterococcus*), as well as the presence of pharmaceutical indicators that suggested the presence of human waste. It was not initially clear which outfall had been sampled as part of the previous sampling so both outfalls were classified as Problem Outfalls. The catchment investigation of these outfalls occurred over several days in May and June 2019.

For outfall 38017, sampling results from the catchment investigation narrowed the area of interest for potential illicit discharge to the infrastructure along Humphrey Street in Swampscott (Outfall 38017). The contributing DCR drainage infrastructure was CCTVed and did not show any signs of illicit connection or dry weather flows, but the dry weather flows in non-DCR owned pipes continued to show elevated parameters. Based on the investigation, it was determined that the flow could be coming from one of the Swampscott residences adjacent to the area of interest.

DCR sent a letter to the Town of Swampscott in November 2019 with a summary of the sampling results and requested that Swampscott dye-test the several residences. COVID remote working impacted DCR's meeting with Swampscott. DCR sent a second letter to the Town of Swampscott in February 2022 with the summary of sampling results and again requested that Swampscott perform dye-testing on residences.

In June 2023, two of the four DCR pipes that interconnect into Swampscott outfall 38017 (Pipe 12640 and Pipe 12649) were sampled during wet weather. Sampling results did not exceed the MS4 permit thresholds indicating there was no illicit input. In August 2023, the

remaining DCR interconnections were screened during wet weather. Sampling results did not exceed the MS4 permit thresholds indicating there was no illicit input. DCR then sent a third letter to the Town of Swampscott in November 2023 to share the most recent sampling results and notify them that DCR will take no additional actions in the catchment and considers the **catchment investigation for outfall 38017 closed** unless additional information comes to light. DCR has yet to receive a response from Swampscott.

The second outfall (37114.1), located in Lynn, was screened during dry weather; no signs of a potential illicit discharge were found. In September 2023, the interconnecting DCR pipes were screened during wet weather. Sampling results did not exceed the MS4 permit thresholds indicating there was no illicit input; therefore, this **catchment investigation for outfall 37114.1 has been closed**.

3.1.2 Morrissey Boulevard (1 outfall; Follow-up ongoing)

The storm drainage system is located along Morrissey Boulevard in Dorchester and includes one outfall. The outfall drains to the mouth of the Neponset River (MA73-04) and ultimately Dorchester Bay. This outfall (21850) was flagged as a Problem outfall based on previous sampling results from both the Boston Water and Sewer Commission (BWSC) and DCR, which showed elevated levels of *Enterococcus*. BWSC shares sampling data with DCR on an annual basis in locations where its system interconnects with DCR's system.

Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Morrissey Blvd 1 (OF-21850)	In Progress	Not Started	Coordinated with BWSC on source and ownership.	DCR will review the results of BWSC's investigation to determine additional follow-up (e.g., dye testing or CCTV) needed to identify the source of potential non-stormwater flow detected during 2019 and 2020 investigations.

The catchment investigation occurred over several days in July 2019. Based on sampling results, the areas of interest were narrowed to the intersection of Morrissey Boulevard and Tenean Street and near the intersection of Morrissey Boulevard and McKone Street. DCR performed follow-up investigations of the infrastructure in the areas of interest. DCR bricked off the connections from several pipes that were identified during CCTV investigation but not included on the map and were confirmed to be abandoned by CCTV investigation.

In order to further confirm the source of the dry weather flow and since there are BWSC sewer lines intersecting the DCR stormwater infrastructure, DCR reached out to BWSC in November 2019 with a summary of sampling results and a request to share information and investigate some of the adjacent sewer lines. DCR sent a follow-up request to BWSC in April 2021. BWSC sent a letter to DCR in response in May 2022 (dated February 2022) noting BWSC plans to reinspect a manhole in dry weather and will dye test two previously un-dye tested buildings in the area. A May 2023 email from BWSC indicated that additional screening and dye testing had not yet identified any illicit input into the drainage system and

that BWSC would send a more formal response with sampling and dye testing results once they complete the remainder of the investigation. In November 2023, BWSC sent the results of their investigation to DCR, which did not uncover any additional evidence of illicit discharge nor identified any sources of the potential non-stormwater flow that was detected during sampling in previous investigations.

DCR will review the detailed results of BWSC's investigation and identify additional actions, if any, are needed to identify and remediate potential non-stormwater flow detected during DCR's 2019 investigation and will continue to coordinate with BWSC to complete this investigation in Permit Year 7.

3.1.3 Tenean Beach (1 outfall; Investigation complete)

This storm drainage system is located immediately south of Tenean Beach in Dorchester. The system extends from the parking area and through the park to one outfall draining to the mouth of the Neponset River (MA73-04) and ultimately Dorchester Bay. This outfall (18257) was flagged as a Problem Outfall based on previous sampling results showing elevated levels of *Enterococcus*.

	Catchment Investigation Status[1]			
Outfall	**Dry Weather**	**Wet Weather**	**Permit Year 6 Investigation Actions**	**DCR's Next Steps**
Tenean Beach 1 (OF-18257)	Complete	Not Required (No SVFs)	Completed prior to Permit Year 6.	**Catchment investigation is complete.**

The catchment investigation occurred over several days in July 2019, September 2019, and February 2020. The July 2019 investigation narrowed the areas of interest to two previously unmapped pipes and two catch basins. DCR determined the two unmapped pipes were no longer in use. DCR capped the two pipes. The catch basins and surrounding infrastructure were reviewed by DCR staff, and it was confirmed that there were no illicit connections. DCR then cleaned the entire drainage system. To confirm there was no longer potential illicit discharges, samples were taken from two catch basins in September 2019 following the cleaning and sampling results showed a decrease in *Enterococcus*.

To close out the problem outfall catchment investigation per the permit, DCR performed dry weather screening of the outfall in February 2020, which was the soonest available dry weather screening window after DCR conducted all follow-up actions. Since sampling results at the outfall did not exceed MS4 sewer input indicators, the catchment had been fully reviewed, and no SVFs have been identified in this area to require wet weather screening, **the outfall catchment investigation for outfall 18257 is considered complete**.

3.1.4 Wollaston Beach (8 outfalls; 6 investigations ongoing; 2 investigations complete)

DCR investigated eight catchments along Wollaston Beach in Quincy, MA. The infrastructure for each of the catchments was generally located along Quincy Shore Drive and the beach. All of the outfalls drain directly to Quincy Bay (MA70-05). These outfalls were flagged as Problem outfalls based on previous sampling results showing elevated levels of *Enterococcus*.

Five of the outfalls originally identified as Problem Outfalls were determined to likely be owned by the City of Quincy. DCR drainage interconnects upstream in the system. The ownership of the outfalls and interconnections from DCR drainage is being officially confirmed via a memorandum of understanding (MOU) between DCR and the City of Quincy that is currently being drafted. Despite the pending status of the MOU, the upstream interconnections, which in many cases include more than one per each of the original Problem outfalls, and their respective catchments were broken out of the original Problem Outfall catchments. These catchments remained categorized as Problem since they drain to the outfalls historically showing elevated levels of *Enterococcus*.

Initial catchment investigations occurred in November 2019 and February 2020. The investigations narrowed the area of interest to three outfalls (outfalls 17661, 90000.1, and 34509.3) with the remaining four not showing signs of potential illicit discharges based on the sewer input indicators outlined in the MS4 Permit.

The table below summarizes the actions taken in Permit Year 6 for this area with greater detail in the section following.

Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Wollaston Beach 1 (OF-34509.3)	In Progress	Complete	• Conducted additional dry weather screening - evidence of potential non-stormwater flow. • DCR conducted CCTV in this catchment and revised mapping/ catchment boundaries including identifying new Problem outfall (666667986).	Determine additional follow-up steps (e.g., dye testing or CCTV) to narrow down the source of potential illicit discharges.
Wollaston Beach 8 (OF-666667986)	In Progress	Not Started	• Newly split from 34509.3 based on CCTV work. • Attempted dry weather investigation during low tide - inconclusive due to standing water throughout the catchment.	• Review previous dry weather investigations data. • Evaluate additional follow-up action items.

Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Wollaston Beach 2 (OF-34507.3)	Complete	Complete	Complete prior to Year 6.	**Catchment is investigation complete.**
Wollaston Beach 3 (4 interconnections to MH-34502.3, drains to OF-17661)	Complete	Complete	• Re-screened during dry weather at low tide; no indication of illicit discharges • Wet weather screening - no evidence of illicit flows. • Completed catchment investigation.	**Catchment is investigation complete.**
Wollaston Beach 7 (MH-37195.00, MH-6002.40 interconnects to OF-90000.1)	In Progress	In Progress	Re-screened during dry weather at low tide - potential non-stormwater flow at interconnection with MH-37195.00 . The catchment was screened during wet weather at MH-6002.4 and no potential illicit flow was found	DCR will conduct additional follow-up measures at MH-37195.00 in question such as dye testing or CCTV, to identify its source.
Wollaston Beach 6 (MH-37193 interconnects to OF-37221.1)	Complete	Not Started	Re-screened during dry weather at low tide, no indication of an illicit discharge.	Conduct wet weather screening.
Wollaston Beach 4 (3 interconnections to MH-34497.3, 1 interconnection to MH-34454.3, 1 blind interconnection downstream of MH-34454.3, drains to OF-34500.3)	Complete	In progress	• Re-screened catchment at low tide. No contamination found in the system interconnecting to MH-34497.3 or MH-34454.3 during dry weather. • Conducted wet weather screening at MH-34497.3 – no signs of contamination • One additional blind interconnection downstream of MH-34454.3 (Pipe 18076) observed with flow - not accessible for sampling.	• Develop plan for identifying if non-stormwater flow from blind connection from Pipe 18076 in dry and wet weather. • Conduct wet weather screening at MH-34454.3

Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Wollaston Beach 5 (MH-37223.1, MH-666667017 interconnects to OF-38020)	In Progress	Not Started	• Re-screened during dry weather at low tide - potential non-stormwater flow identified. • Identified abandoned pipe with potential non-stormwater flow, plugged the pipe. Additional screening confirmed that the elevated level of contaminants was eliminated. • Remainder of the dry weather investigations was inconclusive due to standing water.	Conduct additional follow-up measures, such as CCTV or dye testing, to determine if potential non-stormwater flow is present.

Outfall 34509.3 and 666667986: In Permit Year 5, Outfall 34509.3 was screened and sampled during wet weather and the results did not exceed the permit thresholds and thus were cleared of any wet weather illicit input.

Although Outfall 34509.3 did not show signs of illicit input during wet weather, its dry catchment investigation results from 2020 did indicate the presence of potential non-stormwater flow. In Permit Year 6, the outfall was re-screened during dry weather to confirm the accuracy of the 2020 screening since four years had elapsed since its initial screening and the results from 2020 were only slightly above potential non-stormwater indicator thresholds. The results of this screening conducted in August 2023 continued to show signs of potential illicit input. Catchment investigations in the upstream pipes were inconclusive due to standing water. Following this investigation, DCR updated mapping in this area and identified a separate outfall, added to map as outfall 666667986, which receives runoff from a portion of the catchment previously attributed to Outfall 34509.3. This new outfall was added to DCR's program as a Problem outfall.

In Permit Year 6, additional mapping on the sewer system within the catchments for these two outfalls was retrieved from the City of Quincy and BWSC to inform future investigations. In Permit Year 7 DCR will perform additional follow-up, such as dye testing or CCTV of the updated catchment for Outfall 34509.3, to locate the source of potential non-stormwater flows. DCR will develop a plan to determine whether non-stormwater flow is present and perform follow up if needed for Outfall 666667986 to complete the catchment investigation.

Outfall 34507.3: In Permit Year 5, this outfall was screened and sampled during wet weather. The wet weather sampling results did not exceed the permit thresholds and thus were cleared of any wet weather illicit input. Since both the dry and wet weather screening results

did not show any signs of illicit input, the **catchment investigation for Outfall 34507.3 is considered complete**.

Outfall 17661: For the interconnections upstream of outfall 17661, DCR performed a subsequent CCTV investigation in August 2020 during which the pipes were de-watered showed no flow coming from DCR infrastructure and no illicit connections were found. The results indicate that the sampling results from the 2019 dry weather investigation likely sampled stagnant, standing water in the pipes. To provide a second look, this catchment was re-screened in Permit Year 6 and considerable effort was made to ensure stagnant water was not sampled. The results from the rescreening showed no signs of potential illicit input. Outfall 17661 was wet weather screened in Permit Year 6; results of the screening did not exceed the sewer input indicators and the **catchment investigation for Outfall 17661 was closed**.

Outfall 90000.1: DCR performed a CCTV investigation in August 2020 during which the pipes were de-watered for the interconnections upstream of outfall 90000.1. The investigation showed no flow coming from DCR infrastructure and no illicit connections were found. The results indicate that the pervious 2019 and 2020 dry weather investigation sampling results likely sampled stagnant, standing water in the pipes. To provide a second look, these catchments were re-screened in Permit Year 6 and considerable effort was made to ensure stagnant water was not sampled.

The wet weather screening and sampling for Outfall 90000.10 also did not indicate the presence of non-stormwater flow but was only completed for approximately half of the catchment. In Permit Year 7, the remainder of the catchment to Outfall 90000.10 will be screened during wet weather to complete the investigation.

Outfall 37221.10: The dry weather investigations for Outfall 37221.10 did not show evidence of non-stormwater flow in DCR contributing pipes and was completed for entire catchment. In Permit Year 7, the wet weather screening and sampling will be completed for Outfall 37221.10.

Outfall 34500.3: The dry weather investigations conducted in the catchment to Outfall 34500.3 did not show signs of illicit input and was completed with exception of Pipe 18076, which accepts runoff from approximately one third of the catchment. Flow was observed exiting this pipe during a man-entry inspection further upstream in the system, but it could not be sampled to the lack of a street level access structure at the discharging end of the pipe and a large steel grate that obstructs sampling access from the upstream structure. In Permit Year 7, DCR will discuss and implement potential strategies for detecting whether potential for illicit input is present in the flow originating from pipe 18076. Wet weather screening and sampling was conducted Permit Year 6 for approximately one half of the catchment draining to Outfall. In Permit Year 7, wet weather screening will be completed for the remainder of the catchment.

Outfall 38020: The dry weather investigation for Outfall 38020 revealed potential non-stormwater flow with slightly elevated sampling parameters originating from an abandoned pipe. This pipe was sealed by DCR, which eliminated the elevated sampling parameters. The

dry weather investigation in the remainder of the catchment to Outfall 38020 was inconclusive due to standing water. DCR will conduct further investigations in this catchment, possibly including dye testing and/or CCTV, in Permit Year 7.

3.1.5 Neponset Valley Parkway (1 outfall; Investigation complete)

Outfall 17289 was included in the Problem outfall list in Permit Year 1, but DCR is not aware of historical sampling data indicating potential illicit discharges at this location.

Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Neponset (OF-17289)	Complete	Complete	Completed prior to Permit Year 6.	**Catchment investigation is complete.**

DCR completed both the dry weather screening and wet weather sampling in November 2021 and January 2022, respectively. There was no evidence of illicit discharge during either of these investigations. **The catchment investigation for the outfall 17289 is considered complete.**

3.1.6 Western Avenue (3 outfalls; 1 investigation on-going, 2 investigations complete)

Four outfalls in this location were included in the Permit Year 1 Problem outfall list but DCR is not aware of historical sampling data indicating potential illicit discharges. During review of the outfall locations in the database, we determined that Outfall 19738 was a duplicate of Outfall 19739 and therefore there were only three outfalls to follow up on in this area. Outfall 19738 was removed from DCR's database.

Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Western Ave 1 (OF-19105)	Complete	Not Required (No SVFs)	Completed prior to Permit Year 6.	**Catchment investigation is complete.**
Western Ave 2 (OF-19377)	Complete	Not Required (No SVFs)	Completed prior to Permit Year 6.	**Catchment investigation is complete.**
Western Ave 4 (OF-19379)	Not Started	Not Required (No SVFs)	Developed plans to replace drainage infrastructure.	DCR will replace the drainage infrastructure at this location and continue the catchment investigation process.

DCR performed the catchment investigations in June 2021; there was no flow present for outfalls 19105 and 19377. There are no known SVFs in this location and the **catchment investigation for outfall 19105 and outfall 19377 is considered complete.**

DCR reviewed outfall 19379 to update mapping in this location. As a result of this work, DCR discovered that the outfall pipe (66671867) needed to be replaced. DCR is planning to replace this pipe, which requires DCR to obtain an environmental permit. Once the permit is obtained, DCR will replace the infrastructure and complete the catchment investigation.

3.1.7 Problem Catchment Investigation Summary Table

The table below summarizes the status of the Problem Outfalls and the actions taken during Permit Year 6 to identify if the discharge includes illicit flows.

Table 6 Problem Outfalls Catchment Investigations Summary

Receiving Water (ID), Area/ Town; Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Nahant Bay (MA93-24); Stacey Brook, Lynn and Swampscott				
Stacey Brook 1 (2 interconnections to MH-25416, 2 interconnections to CB-666668502, drains to Outfall 38017)	Complete	Complete	DCR wet weather screened the remaining two interconnection points in this catchment and did not find indication of illicit discharges.	**Catchment investigation is complete.**
Stacey Brook 2 (4 interconnections to MH-25418, 1 blind interconnection downstream of CB-666667101, drains to Outfall 37114.1)	Complete	Complete	DCR conducted wet weather screening at the interconnection points and did not find indication of illicit discharges.	**Catchment investigation is complete.**
Neponset River (MA73-04); Morrissey Boulevard, Dorchester				
Morrissey Blvd 1 (OF-21850)	In Progress	Not Started	BWSC developed an official response outlining the screening results from Permit Year 5, which DCR reviewed in Permit Year 6 to plan next steps.	DCR will review the results of BWSC's investigation to determine additional follow-up (e.g., dye testing or CCTV) needed to identify the source of potential non-stormwater flow detected during 2019 and 2020 investigations.
Tenean Beach 1 (OF-18257)	Complete	Not Required (No SVFs)	DCR completed the Problem outfall catchment investigation prior to Permit Year 6.	**Catchment investigation is complete.**

Receiving Water (ID), Area/ Town; Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Quincy Bay (MA70-05); Wollaston Beach, Quincy				
Wollaston Beach 1 (OF-34509.3)	In Progress	Complete	• DCR conducted additional dry weather screening, which showed evidence of potential non-stormwater flow. The catchment upstream of the outfall was not able to be sampled due to standing water in the pipes. • DCR conducted CCTV in this catchment and determined that the westernmost portion of the catchment that was thought to drain to Outfall 34509.3 drained to a previously unmapped outfall further north. This outfall was assigned the ID 666667986 and designated as a Problem outfall since it discharged to the Wollaston Beach area. • DCR updated catchment boundaries based on this additional mapping information.	DCR will determine additional follow-up steps (e.g., dye testing or CCTV) to narrow down the source of potential illicit discharges.
Wollaston Beach 8 (OF- 666667986)	In Progress	Not Started	DCR conducted a CCTV investigation of this catchment in Permit Year 6 and discovered that it discharged to a separate outfall, which was then mapped and assigned an ID of 666667986. DCR attempted to complete a dry weather investigation of this outfall and its upstream infrastructure during low tide in Permit Year 6, but the results were inconclusive due to standing water throughout the catchment.	DCR will review the data collected during the previous dry weather investigations in this catchment and evaluate additional follow-up action items (e.g., dye testing or CCTV) to determine whether potential non-stormwater flow is present in the catchment.
Wollaston Beach 2 (OF-34507.3)	Complete	Complete	DCR completed the Problem outfall catchment investigation prior to Permit Year 6.	**Catchment is investigation complete.**

Receiving Water (ID), Area/ Town; Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Wollaston Beach 3 (4 interconnections to MH-34502.3, drains to OF-17661)	Complete	Complete	• DCR re-screened the catchment during dry weather at low tide; no indication of illicit discharges was found. • DCR conducted wet weather screening, which did not show evidence of illicit flows. • DCR completed the catchment investigation.	**Catchment is investigation complete.**
Wollaston Beach 4 (3 interconnections to MH-34497.3, 1 interconnection to MH-34454.3, 1 blind interconnection downstream of MH-34454.3, drains to OF-34500.3)	Complete	In progress	• DCR re-screened the catchment during dry weather at low tide. No contamination was found in the system interconnecting to MH-34497.3 or MH-34454.3 during dry weather. • DCR conducted wet weather screening at MH-34497.3 and did not find signs of contamination. • One additional blind interconnection downstream of MH-34454.3 (Pipe 18076) was observed to be flowing during a man-entry inspection at MH-34454.3 but was not able to be sampled due to a metal grate that obstructs access to the interconnection location.	DCR will create a plan for identifying whether there is evidence of non-stormwater flow originating from the flowing Pipe 18076 during both dry and wet weather and conduct wet weather screening at MH-34454.3.
Wollaston Beach 5 (MH-37223.1, MH-666667017 interconnects to OF-38020)	In Progress	Not Started	DCR re-screened the catchment during dry weather at low tide. DCR detected potential non-stormwater flow originating from an abandoned pipe in the drainage catchment. DCR plugged the abandoned pipe and eliminated the elevated level of contaminants. The remainder of the dry weather investigations was inconclusive due to standing water.	DCR will conduct additional follow-up measures, such as CCTV or dye testing, to determine if potential non-stormwater flow is present.

Receiving Water (ID), Area/ Town; Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Wollaston Beach 6 (MH-37193 interconnects to OF-37221.1)	Complete	Not Started	DCR re-screened the catchment during dry weather at low tide, no indication of an illicit discharge was identified.	DCR will conduct wet weather screening.
Wollaston Beach 7 (MH-37195.00, MH-6002.40 interconnects to OF-90000.1)	In Progress	Not Started	DCR re-screened the catchment during dry weather at low tide. No indication of an illicit discharge was identified from the interconnection from MH-6002.40. Potential non-stormwater flow was found from the interconnection from MH-37195.00. The catchment was screened during wet weather at MH-6002.4 and no potential illicit flow was found.	DCR will conduct additional follow-up measures at MH-37195.00 such as dye testing or CCTV, to identify its source.
Neponset River (MA73-02); Neponset Valley Parkway, Boston				
Neponset (OF-17289)	Complete	Complete	DCR completed the Problem outfall catchment investigation prior to Permit Year 6.	**Catchment investigation is complete.**
Charles River (MA72-36); Western Avenue, Cambridge				
Western Ave 1 (OF-19105)	Complete	Not Required (No SVFs)	DCR completed the Problem outfall catchment investigation prior to Permit Year 6.	**Catchment investigation is complete.**
Western Ave 2 (OF-19377)	Complete	Not Required (No SVFs)	DCR completed the Problem outfall catchment investigation prior to Permit Year 6.	**Catchment investigation is complete.**
Western Ave 4 (OF-19379)	Not Started	Not Required (No SVFs)	DCR developed plans to replace drainage infrastructure in the catchment and therefore DCR has held off on further investigation until the work is complete.	DCR will replace the drainage infrastructure at this location and continue the catchment investigation process.

1 – Catchment Investigation Status descriptions:

Not Started: Investigation has not begun.

In Progress: Investigation is on-going.

Complete: Investigation is complete and either no suspect flow has been identified or suspect flow has been identified and removed as a result of the investigation.

3.2 Highest Priority Catchment Investigations

In addition to investigating Problem Outfalls, DCR focused considerable time and efforts on catchment investigations of Highest Priority Outfalls in Permit Year 6. As of this report, DCR has begun dry weather investigations for seventeen of the eighteen Highest Priority catchments. Each investigation requires desktop analysis of the drainage system and SVFs, field screening and sampling, and significant coordination between VHB, SDE and DCR as well as other entities includes homeowners, municipalities, other state agencies and commercial businesses. A summary of the actions performed in Permit Year 6 are included in **Table 7**. A summary of actions prior to Permit Year 6 are outlined in the Permit Year 4 and Permit Year 5 IDDE Summary Report or are available upon request from DCR.

Table 7 Highest Priority Outfalls Catchment Investigations Summary

Receiving Water (ID), Area/ Town; Outfall	**Catchment Investigation Status[1]**		**Permit Year 6 Investigation Actions**	**DCR's Next Steps**
	Dry Weather	**Wet Weather**		
Mystic River and Tribs (MA71-03, MA71-02 & MA71-13) Mystic Valley Parkway, Medford				
OF-22724	Complete	Complete	DCR completed the outfall catchment investigation prior to Permit Year 6.	**Catchment investigation is complete.**

Receiving Water (ID), Area/ Town; Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
OF-22021	In Progress	Not Started	• DCR measured elevations of the nearby MWRA sanitary sewer system and the DCR drainage system and determined that the sanitary sewer system was significantly deeper than the drainage system. Therefore, it was decided that there was no chance of impact from sanitary sewer and therefore dye testing was not necessary. • DCR investigated the drainage system of a private parking lot to the north of the catchment and confirmed that it was not a source of potential non-stormwater flow into the adjacent DCR system. • DCR conducted dry weather screening and sampled groundwater infiltration entering catch basins and manholes in the catchment. Sampling results indicated the presence of potential non-stormwater flow. • DCR lined all catch basins within the catchment, rescreened the outfall during dry weather, and found non-stormwater flow was still present.	DCR will line the additional two manholes in the catchment the pipes upstream of the outfall to eliminate the potential non-stormwater flow entering the system via groundwater. Once lining is complete follow-up dry weather testing will be performed to confirm the removal of the potential non-stormwater flow in the catchment. Lastly, wet weather screening and sampling will be performed to close the catchment investigation.
OF-22018	Complete	In Progress	DCR conducted wet weather screening at a manhole upstream of OF-22018 due to standing water at the outfall and did not find any indication of an illicit discharge. However, DCR determined that since the first wet weather screening, which exceeded sewer input indicators, was conducted at the outfall and a sanitary sewer runs in close proximity to the outfall pipe, DCR wants to perform additional screening to conclusively rule out possibility of contamination originating from outfall pipe.	DCR will re-screen and sample the outfall during wet weather at the outfall to determine with there is non-stormwater flow to the outfall.

Receiving Water (ID), Area/ Town; Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
OF-21979	In Progress	Not Started	DCR conducted dry weather investigations and found potential non-stormwater flow.	DCR will obtain as-built drainage and sewerage plans for the area and perform dye testing to locate the source of the potential non-stormwater flows.
Mystic River (MA71-03) O'Malley Memorial Park, Chelsea				
OF-666667734	In Progress	Not Started	• DCR conducted dry weather outfall screening in the catchment. The sampling results from the screening exceeded the sewer input indicators and this catchment was elevated to Highest priority. • DCR conducted an initial dry weather catchment investigation and identified potential non-stormwater flow in the northern section of the catchment. • DCR conducted dye testing on the sewer system that runs parallel to the drainage system. Results from this effort did not suggest an illicit connection from the sewer system. • DCR conducted a CCTV investigation of the catchment and determined that the potential non-stormwater flow was entering the system via groundwater infiltration.	DCR will install CIPP liners throughout the section of the catchment where groundwater infiltration was observed to prevent groundwater containing potential illicit input from entering the system.

Receiving Water (ID), Area/ Town; Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Malden River (MA71-05) Mystic View Rd, Everett				
OF-27645	In Progress	Not Started	DCR made several attempts to contact the City of Everett regarding the February 2023 letter DCR sent the City requesting they conduct a CCTV survey of their sanitary sewer pipes in the areas, but obtained no response.	DCR will line the pipes in the catchment to prevent groundwater containing potential illicit input from entering the system.
Neponset River (MA73-02) Truman Parkway, Hyde Park				
MH-17009 (interconnects to OF-666666991)	Complete	Complete	• DCR reviewed infrastructure ownership in the area and determined that OF-666666991 is not DCR owned and that DCR's infrastructure interconnects to OF-666666991 further upstream. DCR conducted a dry weather catchment investigation of their upstream interconnection locations, which did not show any indication of non-stormwater flow from DCR owned infrastructure in the catchment. • DCR conducted wet weather screening and did not find indication of an illicit discharge.	**Catchment investigation is complete.**
MH-666667147 (interconnects to OF-666666991)	Complete	Complete	• DCR reviewed infrastructure ownership in the area and determined that OF-666666991 is not DCR owned and that DCR's infrastructure interconnects to OF-666666991 further upstream. DCR conducted a dry weather catchment investigation of their upstream interconnection locations, which did not show any indication of non-stormwater flow from DCR owned infrastructure in the catchment. • DCR conducted wet weather screening and did not find indication of an illicit discharge.	**Catchment investigation is complete.**

Receiving Water (ID), Area/ Town; Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
MH-17006 interconnects to OF-666666991	Complete	Complete	• DCR reviewed infrastructure ownership in the area and determined that OF-666666991 is not DCR owned and that DCR's infrastructure interconnects to OF-666666991 further upstream. DCR conducted a dry weather catchment investigation of their upstream interconnection locations, which did not show any indication of non-stormwater flow from DCR owned infrastructure in the catchment. • DCR conducted wet weather screening and did not find indication of an illicit discharge.	**Catchment investigation is complete.**
IN-2011 interconnects to OF-666666991	Complete	Complete	• DCR reviewed infrastructure ownership in the area and determined that OF-666666991 is not DCR owned and that DCR's infrastructure interconnects to OF-666666991 further upstream. DCR conducted a dry weather catchment investigation of their upstream interconnection locations, which did not show any indication of non-stormwater flow from DCR owned infrastructure in the catchment. • DCR conducted wet weather screening and did not find indication of an illicit discharge.	**Catchment investigation is complete.**

Receiving Water (ID), Area/ Town; Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
MH-17005 interconnects to OF-666666991	Complete	Complete	• DCR reviewed infrastructure ownership in the area and determined that OF-666666991 is not DCR owned and that DCR's infrastructure interconnects to OF-666666991 further upstream. DCR conducted a dry weather catchment investigation of their upstream interconnection locations, which did not show any indication of non-stormwater flow from DCR owned infrastructure in the catchment. • DCR conducted wet weather screening and did not find indication of an illicit discharge.	**Catchment investigation is complete.**
Lynn Harbor (MA93-52) Lynn Shore Reservation, Nahant				
OF-666667157	Complete	Complete	• DCR updated mapping in northern portion of catchment. Infrastructure that was previously mapped as connecting to OF-666667157 upstream of MH-15125 was found to actually drain to OF-666667686. • DCR re-lined sanitary sewer pipes in the catchment to eliminate the second illicit discharge (Illicit ID 3). • DCR conducted confirmatory screening and confirmed that both illicit discharges were eliminated. DCR conducted wet weather screening and did not find indication of an illicit discharge.	**Catchment investigation is complete**.
Dorchester Bay (MA70-03) Morrisey Boulevard, Boston				
MH-17701	In Progress	Not Started	DCR obtained as-built plans for the catchment area.	DCR will review as-built plans for the area to determine likely sources of non-stormwater flows and to create a plan for dye testing the area.

Receiving Water (ID), Area/ Town; Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Neponset River (MA73-04)				
MH-666667098	In Progress	Not Started	• DCR conducted dye testing on the adjacent sewer system, which has a history of SSOs, within the catchment. Dye testing did not indicate the presence of illicit input from the adjacent sewer system. • DCR reviewed previous screening results and discovered that the initial dry weather sampling conducted at the manhole included flow from a non-DCR pipe and that high tide may be carrying contamination from the non-DCR infrastructure to DCR's pipe. • DCR rescreened the interconnection to test potential influence of tidal patterns on the contamination. DCR screened pipe 15019 during low tide, just before high tide, and as the tide fell just below the invert of pipe 15019.	DCR will review results from Permit Year 6 activities to determine next steps to isolate and eliminate the potential non-stormwater discharge.
Neponset River (MA73-03)				
MH-17106	Not Started	Not Started	Dry weather screening at the end of Permit Year 6 detected the presence of potential illicit input due to a sewage smell at a catch basin upstream of MH-17106.	DCR will conduct a dry weather investigation in the catchment to isolate the source of the potential non-stormwater input.

Receiving Water (ID), Area/ Town; Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Unnamed Tributary (MA72-38)				
MH-27352	Not Started	Not Started	• DCR discovered potential illicit discharges in the catchment during routine maintenance and CCTV investigations. • DCR attempted dye testing in this area at four properties (705, 707, 647, and 651 W. Roxbury Parkway). 705 and 651 W. Roxbury Parkway did not respond to coordination attempts. • DCR confirmed an illicit connection at 647 W. Roxbury Parkway through dye testing. DCR then coordinated with BWSC to retrieve additional dye testing records and confirm an additional illicit connection at 651 W. Roxbury Parkway. These records also confirmed an illicit connection is not present at 705 W. Roxbury Parkway. • DCR notified BWSC of the illicit discharges and mutually agreed that BWSC would address removal of the illicit connections.	Once the illicit connections are removed, DCR will clean the system and conduct confirmatory and routine screening in the catchment.
Benetts Pond Brook (MA93-48)				
IN-4414	Not Needed	Complete	• This catchment was originally elevated to highest priority due to a sewage smell at the catch basin during dry weather screening. • DCR revisited the catch basin to clean, de-water it, and sample any infiltration or flow into the basin. DCR did not observe any flow or infiltration into the basin and did not observe any visual or olfactory evidence of an illicit discharge in the basin. • DCR wet weather screened the catch basin and did not detect any potential contamination.	**Catchment investigation is complete**.

Receiving Water (ID), Area/ Town; Outfall	Catchment Investigation Status[1]		Permit Year 6 Investigation Actions	DCR's Next Steps
	Dry Weather	Wet Weather		
Charles River (MA72-38); Storrow Drive				
OF-19326	In Progress	Not Started	DCR conducted a dry weather catchment investigation and detected potential non-stormwater flow. During this investigation, infiltration into the drainage system via the connections between the drainage pipes and structures was observed. Since there is no sanitary sewer in the area and no direct illicit connections were observed during a previous routine CCTV investigation, DCR determined that the source of the potential illicit input is likely non-stormwater flow conveyed via groundwater.	DCR will seal the joints between the drainage pipes and structures to prevent contaminated groundwater infiltration and conduct confirmatory screening in the catchment.

1 – Catchment Investigation Status descriptions:

Not Started: Investigation has not begun.

In Progress: Investigation is on-going.

Complete: Investigation is complete and either no suspect flow has been identified or suspect flow has been identified and removed as a result of the investigation.

3.3 High Priority Catchment Investigations

DCR committed considerable time and made significant progress on completing High priority catchment investigations this year, with an eye on the Permit Year 10 deadline. Desktop GIS analysis is performed to determine presence of System Vulnerability Factors (SVFs), which indicate the need for wet weather testing, and are reviewed for the presence of junction structures, which determine whether additional dry weather screening is needed upstream of the outfall or if the initial dry weather outfall screening satisfies permit requirements alone pursuant to Section 2.3.4.8.c.ii.1. Catchments requiring additional field work are then scheduled for the appropriate investigative actions. VHB and SDE completed 177 high priority catchment investigations and 206 are still in progress. The ones in progress are often waiting for wet weather screening conditions to complete the investigation.

DCR will continue to commit significant resources and focus on making progress on the active High priority catchment investigations to the extent possible, while juggling the need to complete Problem outfall investigations this year.

3.4 Low Priority Catchment Investigations

Since low priority categorized outfalls are often in adjacent geographic areas to High, Highest, or Problem outfalls, VHB and SDE have performed these investigations when it is most efficient along with other tasks. VHB reviewed low priority catchments in GIS including each outfall's regulatory status, SVFs in the catchment, and indicated in the database that these outfalls are ready for field work. The field teams completed 18 Low priority catchments complete and 17 were partially completed during Permit Year 6.

The Low priority catchments will generally be completed following the completion of High priority catchments except when geography makes it most efficient to perform simultaneously.

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Illicit Discharge Removal

Prior to Permit Year 6, DCR identified three sources of illicit discharge into DCR-owned drainage systems. DCR removed two of these illicit discharges and scheduled the third for removal in Permit Year 6. In Permit Year 6, the one remaining illicit discharge identified in Permit Year 5 was removed, and six additional illicit discharges were identified. Removal of these six illicit discharges is planned for Permit Year 7. Below are the details for the nine illicit discharges identified to date.

Illicit ID 1

- *Location*: Community Rowing, Boston (Charles River)
- *Description*: two sinks (hand washing basins) discharging into a catch basin
- *Method and date of discovery*: catchment investigation on 5/19/2021
- *Date of elimination*: 6/7/2021
- *Date of confirmatory Dry Weather Screening*: N/A[9]
- *Date of confirmatory Wet Weather Screening*: N/A[9]
- *Mitigation or enforcement action or planned corrected measures and schedule for completing the illicit discharge removal:* DCR contacted the facility manager to

[9] The structure at which this illicit discharge was discovered did not have flow nor did any structures in the catchment show signs of an illicit discharge before the illicit connection was removed. This illicit discharge was discovered incidentally during the investigation, rather than being located as the result of detection through dry weather flow screening/sampling. As such, confirmatory screening was deemed unnecessary.

inform him that the illicit sink drain must be disconnected from DCR's drainage system. The facility manager complied with the order and sent DCR photo evidence confirming that the illicit discharge had been removed.

- *Estimated volume of sewage removed:* N/A. Sewage was not the source of the illicit discharge.

Illicit ID 2

- *Location*: Lynn Shore Reservation, Nahant (Nahant Bay)
- *Description*: Non-stormwater flow originated from abandoned pipes in adjacent Sewer Manhole (SMH), which services the DCR Coastal Operations Building, that were not properly plugged. Abandoned pipes discharged into backfill/bedding material of drainage pipe 66669193 and infiltrated through first two pipe joints downstream of Manhole 666666941.
- *Method and date of discovery*: Dye testing on 12/14/2022
- *Date of elimination*: 1/11/2023
- *Date of confirmatory Dry Weather Screening*: 11/3/2023
- *Date of confirmatory Wet Weather Screening*: 3/7/2024[10]
- *Mitigation or enforcement action or planned corrected measures and schedule for completing the illicit discharge removal:* The illicit discharge was eliminated by removing and capping abandoned pipe stubs in adjacent sanitary sewer manhole (SMH) and installing cementitious lining to prevent exfiltration through SMH masonry. Dye testing completed after maintenance work confirmed the removal of the illicit discharge.
- *Estimated volume of sewage removed:* 15 gallons/day
  - Formula: $\mathrm{P} \times \mathrm{WWR} \times \mathrm{ER} = \text{Volume of Sewage Removed (Gallons/Day)}$
    - **P =** 20 persons
      - *Average daily occupancy DCR Coastal Operations Building*
    - **WWR** = 5 gallons/person/day
      - *Assumed typical wastewater flow rates from DCR Coastal Operations Building*
    - **ER** = 0.15 gallons of wastewater exfiltration from illicit discharge/gallons of wastewater flow to illicit discharge
      - *DCR estimate based on dye test observations*

Illicit ID 3

- *Location*: Lynn Shore Reservation, Nahant (Nahant Bay)
- *Description*: Exfiltration from adjacent cracked sanitary sewer line
- *Method and date of discovery*: CCTV on 1/17/2023
- *Date of elimination*: 10/11/2023

[10] The Illicit Discharge was discovered and removed prior to the first wet weather screening and sampling event. As such, this wet weather screening satisfies both the standard and confirmatory wet weather screening requirements pursuant to the MS4 Permit sections 2.3.4.8.c.ii.2 and 2.3.4.8.e.ii, respectively.

- *Date of confirmatory Dry Weather Screening*: 11/3/2023
- *Date of confirmatory Wet Weather Screening*: 3/7/2024[11]
- *Mitigation or enforcement action or planned corrected measures and schedule for completing the illicit discharge removal:* DCR installed a Cured-in-Place-Pipe (CIPP) liner to seal the cracked sanitary sewer pipe and prevent any future sewage exfiltration.
- *Estimated volume of sewage removed:* 15 gallons/day

Formula: $P \times WWR \times ER = \text{Volume of Sewage Removed (Gallons/Day)}$

P = 20 persons

Average daily occupancy DCR Coastal Operations Building

WWR = 5 gallons/person/day

Assumed typical wastewater flow rates from DCR Coastal Operations Building

ER = 0.15 gallons of wastewater exfiltration from illicit discharge/gallons of wastewater flow to illicit discharge

DCR estimate based on dye test observations

Illicit ID 4

- *Location*: 647 West Roxbury Parkway
- *Description*: Direct connection from sanitary sewer lateral
- *Method and date of discovery*: Dye testing on 5/22/2024
- *Date of elimination*: Scheduled to be completed in Fall 2024
- *Date of confirmatory Dry Weather Screening*: Incomplete. Scheduled for Fall 2024
- *Date of confirmatory Wet Weather Screening*: Incomplete. Scheduled for Fall 2024
- *Mitigation or enforcement action or planned corrected measures and schedule for completing the illicit discharge removal:* The illicit discharge will be removed by disconnecting the sanitary sewer lateral from the drainage system and reconnecting it to the adjacent sanitary sewer system main line. BWSC and DCR have mutually agreed that BWSC will conduct this work and that BWSC will inform DCR once it is complete.
- *Estimated volume of sewage removed:* To be determined. The illicit discharge has not yet been removed.

Illicit ID 5

- *Location*: 651 West Roxbury Parkway
- *Description*: Direct connection from sanitary sewer lateral

[11] The Illicit Discharge was discovered and removed prior to the first wet weather screening and sampling event. As such, this wet weather screening satisfies both the standard and confirmatory wet weather screening requirements pursuant to the MS4 Permit sections 2.3.4.8.c.ii.2 and 2.3.4.8.e.ii, respectively.

- *Method and date of discovery*: CCTV inspection on 5/22/2024; confirmed by BWSC email on 5/30/2024
- *Date of elimination*: 8/21/2024[12]
- *Date of confirmatory Dry Weather Screening*: Incomplete. Scheduled for Fall 2024
- *Date of confirmatory Wet Weather Screening*: Incomplete. Scheduled for Fall 2024 or Spring 2025
- *Mitigation or enforcement action or planned corrected measures and schedule for completing the illicit discharge removal:* BWSC removed this illicit discharge by disconnecting the sanitary sewer lateral from the drainage system and reconnecting it to the adjacent sanitary sewer system main line.
- *Estimated volume of sewage removed:* 290 gallons/day[13]

Illicit ID 6

- *Location*: Storrow Drive, Boston
- *Description*: Potential illicit input via groundwater infiltration (source unknown)
- *Method and date of discovery*: A 11/8/2023 dry weather investigation found that groundwater containing potential non-stormwater flow was entering the drainage system via infiltration through the joints between pipes and drainage structures throughout the catchment. Since there are no sanitary sewer pipes in the vicinity of this catchment and previous DCR CCTV investigation found no direct illicit connections into the system, the origin of the potential illicit input in the groundwater is unknown.
- *Date of elimination*: Scheduled to be completed by Fall 2024
- *Date of confirmatory Dry Weather Screening*: Incomplete. Scheduled for Fall 2024 or Spring 2025
- *Date of confirmatory Wet Weather Screening*: Incomplete. Scheduled for Fall 2024 or Spring 2025
- *Mitigation or enforcement action or planned corrected measures and schedule for completing the illicit discharge removal:* Illicit discharge is planned to be removed by sealing and grouting pipe connections into drainage structures throughout the catchment.
- *Estimated volume of sewage removed:* To be determined. The illicit discharge has not yet been removed.

[12] This illicit discharge was removed prior to the submittal of this report; however, since it was completed in Permit Year 7, it will not be included in the illicit discharge removal numbers throughout previous sections in this report and in the Permit Year 6 Annual Report.

[13] This estimate was provided by BWSC

Illicit ID 7

- *Location*: Mystic View Rd, Everett
- *Description*: Potential illicit input via groundwater infiltration (source unknown)
- *Method and date of discovery*: A 2020 CCTV investigation showed groundwater infiltration entering the system via pipe joints in the southern portion of the catchment. A 6/7/2021 dry weather sampling investigation discovered that this groundwater infiltration contained potential non-stormwater input. DCR dye tested adjacent businesses in April and May of 2022, which did not show any evidence of sanitary sewer infiltration into the stormwater system. As such, the origin of the potentially illicit input into the groundwater is unknown.
- *Date of elimination*: Scheduled to be completed by Fall 2024
- *Date of confirmatory Dry Weather Screening*: Incomplete. Scheduled for Fall 2024 or Spring 2025
- *Date of confirmatory Wet Weather Screening*: Incomplete. Scheduled for Fall 2024 or Spring 2025
- *Mitigation or enforcement action or planned corrected measures and schedule for completing the illicit discharge removal:* The illicit discharge will be removed by lining pipes in the DCR stormwater system to prevent the infiltration of groundwater containing potential illicit input.
- *Estimated volume of sewage removed:* To be determined. The illicit discharge has not yet been removed.

Illicit ID 8

- *Location*: Mary O'Malley Park, Chelsea
- *Description*: Potential illicit input via groundwater infiltration (source unknown)
- *Method and date of discovery*: A dry weather investigation conducted in January 2024 discovered the presence of potential non-stormwater input into the system. DCR conducted dye testing on an adjacent sanitary sewer pipe in April 2024 and did not find any evidence of sanitary sewer infiltration into the DCR system. Following the dye test, DCR conducted a CCTV investigation in June 2024 that confirmed that the potential non-stormwater flow in the system originates from groundwater infiltration in numerous locations throughout the drainage system. The source of the potential illicit input into the groundwater is unknown.
- *Date of elimination*: Scheduled to be completed by Spring 2025
- *Date of confirmatory Dry Weather Screening*: Incomplete. Scheduled for Spring 2025 once illicit discharge removal is completed.
- *Date of confirmatory Wet Weather Screening*: Incomplete. Scheduled for Spring 2025
- *Mitigation or enforcement action or planned corrected measures and schedule for completing the illicit discharge removal:* DCR plans to eliminate the Illicit discharge by lining the drainage system to prevent groundwater infiltration.

- *Estimated volume of sewage removed:* To be determined. The illicit discharge has not yet been removed.

Illicit ID 9

- *Location*: Mystic Valley Parkway, Medford
- *Description*: Potential illicit input via groundwater infiltration (source unknown)
- *Method and date of discovery*: DCR conducted a dry weather investigation in 2022 that identified potential non-stormwater input into the drainage system. In 2023, two nearby MWRA sanitary sewer pipes were investigated and determined to be elevated significantly below the DCR drainage system and were ruled out as a source of the potential illicit input. Additionally, DCR investigated the drainage system of an adjacent, privately owned parking lot and determined that the system was not connected to DCR's drainage system. As such, the adjacent private drainage system was ruled out as a potential source as well. In December 2023, DCR dewatered several catch basins within the catchment and observed groundwater infiltration through the walls of the basins. This groundwater infiltration was sampled and was determined to contain potential illicit input. The origin of the potential illicit input into the groundwater is unknown.
- *Date of elimination*: On 3/15/2024 DCR lined the four catch basins identified as having groundwater infiltration. However, confirmatory screening showed that this did not fully eliminate the issue. Follow-up work to seal and line the remaining structures and pipes in the system is scheduled for Fall 2024.
- *Date of confirmatory Dry Weather Screening*: 4/17/2024. Results indicated that maintenance work did not successfully remove all illicit input into the system. Follow-up confirmatory screening scheduled for Fall 2024 or Spring 2025 to confirm additional lining of the system adequately eliminated the non-stormwater flow.
- *Date of confirmatory Wet Weather Screening*: Incomplete. Scheduled for Fall 2024 or Spring 2025
- *Mitigation or enforcement action or planned corrected measures and schedule for completing the illicit discharge removal:* DCR plans to eliminate the illicit discharge by lining the pipes and manholes in the catchment to prevent groundwater infiltration.
- *Estimated volume of sewage removed:* To be determined. The illicit discharge has not yet been removed.