Town of Durham, Connecticut

2019 Annual Report

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems

Permit Number GSM000076

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MS4 General Permit
Town of Durham 2019 Annual Report
Existing MS4 Permittee
Permit Number GSM 000076
January 01, 2019 - December 31, 2019

This report documents the Town of Durham's efforts to comply with the conditions of the MS4 General Permit to the maximum extent practicable (MEP) from January 01, 2019 to December 31, 2019.

Robin Newton replaced Geoffrey Colegrove as the Town Planner in December 2019.

Part I: Summary of Minimum Control Measure Activities

1. Public Education and Outreach (Section 6 (a)(1) / page 19)

1.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Responsible Person and Department	Due	Date completed or projected completion date	Additional details
1-1 Implement Public Education and Outreach	To be developed in 2020.	2017 - None 2018 - None 2019 - None Before July 01, 2020 Clean Waters Starting in Your Home and Yard Fact Sheets prepared by a collaborative effort between the Connecticut Sea Grant Extension Program and the University of Connecticut Cooperative Extension System NEMO Program will be made available to the public on the town website at:	Improving	Laura Francis, First Selectwoman, Board of Selectmen	July 01, 2018	Before July 01, 2020	

		http://www.townofdurhamct.org/					
1-2 Address Public Education and Outreach for Pollutants of Concern*	To Be Developed in 2020.	2017 - None 2018 - None 2019 - None The Coginchaug River was an impaired water body due to bacteria in the 2018 Integrated Water Quality Report prepared by the CT DEEP. Educational resources with the goal of reducing bacteria loads to town waters will be developed.		Laura Francis, First Selectwoman, Board of Selectmen	July 1, 2018	Before July 01, 2020	

1.2 Describe any Public Education and Outreach activities planned for the next year, if applicable.

See 1-1 and 1-2 above.

It is anticipated that the town website will provide a link to the Connecticut River Coastal Conservation District, Inc. Connecticut River Watch Program Coginchaug River Watershed Water Quality Study Results.

1.3 Details of activities implemented to educate the community on stormwater

Program Element / Activity	Audience (and number of people reached)	Topic(s) covered	Pollutant of Concern addressed (if applicable)	Responsible dept. or partner org.

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2. Public Involvement/Participation (Section 6(a)(2) / page 21)

2.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Responsible Person and Department	Due	Date completed or projected completion date	Additional details
2-1 Comply with public notice requirements for the Stormwater Management Plan	Completed	A hard copy of the Draft 2017 Stormwater Management Plan (SMP) was made available to the public for review and comment on the town website at: http://www.townofdurhamct.org/	The 2017 SMP was available to the public for review and comment.	Laura Francis, First Selectwoman, Board of Selectmen	April 03, 2017	April 20, 2017	No public comments were received by the Office of the First Selectwoman
2-2 Comply with public notice requirements for Annual Reports	Completed	The Draft 2017 MS4 Annual Report was available for public review and comment.	The 2017 MS4 Annual Report was made available to the public for review and comment.	Laura Francis, First Selectwoman, Board of Selectmen	Feb 15, 2018	February 21, 2018	No public comments were received by the Office of the First Selectwoman
	Completed	The Draft 2018 MS4 Annual Report was available for public review and comment.	The 2018 MS4 Annual Report was made available to the public for review and comment.	Laura Francis, First Selectwoman, Board of Selectmen	Feb 15, 2019	March 06, 2019	No public comments were received by the Office of the First Selectwoman
	Completed	The Draft 2019 MS4 Annual Report was available for public review and comment.	The 2019 MS4 Annual Report was made available to the public for review and comment.	Laura Francis, First Selectwoman, Board of Selectmen	Feb 15, 2019	June 02, 2020	

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2-3 Public Participation	Completed	The Connecticut River Coastal Conservation District, Inc. has developed the Connecticut River Watch Program which includes the Coginchaug River Watershed Water Quality Testing.		The Connecticut River Coastal Conservation District, Inc			
	2012	The Connecticut River Coastal Conservation District, Inc. recruited and trained fifteen volunteers from the community to collect biweekly water samples for bacteria testing from June 13th through October 17th (ten sample days) for twenty-one sample sites in the Coginchaug River Watershed. Samples were obtained from ten sample sites located in Durham: Analysis Area 3 Allyn Brook AlB029 Chalker Brook ChB005 Creampot Brook CrB030 Fowler Brook FoB015 Fowler Brook FoB020 Hersig Brook HeB005 Parmalee Brook PaB050 Sawmill Brook SaB110 Analysis Area 4 Coginchaug River CoR055 Unnamed Tributary		The Connecticut River Coastal Conservation District, Inc			

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		Mica Hill Area UMH010					
	2013	The Connecticut River Coastal Conservation District, Inc. recruited and trained five volunteers from the community to collect weekly water samples for bacteria testing from July 17th to September 11th (nine sample days) for eleven sample sites in the upper part of the Coginchaug River Watershed. Samples were obtained from five sample sites located in Durham: Analysis Area 3 Fowler Brook FoB015 Fowler Brook FoB020 Sawmill Brook SaB110 Analysis Area 4 Coginchaug River CoR055 Coginchaug River CoR060		The Connecticut River Coastal Conservation District, Inc			
	2014	The Connecticut River Coastal Conservation District, Inc. recruited and trained volunteers from the community to collect weekly water samples for bacteria testing from June 25th to August 20th (nine sample days) for twenty-four sample sites in the upper part of the Coginchaug River Watershed.		The Connecticut River Coastal Conservation District, Inc			

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		Samples were obtained from eight sample sites located in Durham: Analysis Area 3 Birch Mill Brook BMB010 Coginchaug River CoR050 Fowler Brook FoB015 Fowler Brook FoB020 Sawmill Brook SaB110 Analysis Area 4 Coginchaug River CoR055 Unnamed Tributary-GF UGF001					
	2015	The Connecticut River Coastal Conservation District, Inc. recruited and trained volunteers from the community to collect weekly water samples for bacteria testing from June 17th to August 12th (nine sample days) for twelve sample sites in the upper part of the Coginchaug River Watershed. Samples were obtained from six sample sites located in Durham: Analysis Area 3 Birch Mill Brook BMB010 Coginchaug River CoR050 Fowler Brook FoB015 Fowler Brook FoB020		The Connecticut River Coastal Conservation District, Inc			

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		Analysis Area 4 Coginchaug River CoR055 Coginchaug River CoR060					
	2016	The Connecticut River Coastal Conservation District, Inc. recruited and trained volunteers from the community to collect weekly water samples for bacteria testing from July 20th to September 14th (nine sample days) for seven sample sites in the upper part of the Coginchaug River Watershed. Samples were obtained from four sample sites located in Durham: Analysis Area 3 Coginchaug River CoR050 Fowler Brook FoB015 Analysis Area 4 Coginchaug River CoR055 Coginchaug River CoR060		The Connecticut River Coastal Conservation District, Inc			
	2017	The Connecticut River Coastal Conservation District, Inc. recruited and trained volunteers from the community to collect weekly water samples for bacteria testing from July 12th to September 06th (nine sample days) for seven sample sites in the upper part of the Coginchaug River Watershed.		The Connecticut River Coastal Conservation District, Inc			

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		Samples were obtained from four sample sites located in Durham: Analysis Area 3 Coginchaug River CoR050 Fowler Brook FoB015 Analysis Area 4 Coginchaug River CoR055 Coginchaug River CoR060					
	2018	The Connecticut River Coastal Conservation District, Inc. recruited and trained volunteers from the community to collect weekly water samples for bacteria testing from July 11th to September 05th (nine sample days) for seven sample sites in the upper part of the Coginchaug River Watershed. Samples were obtained from four sample sites located in Durham: Analysis Area 3 Coginchaug River CoR050 Fowler Brook FoB015 Analysis Area 4 Coginchaug River CoR055 Coginchaug River CoR060		The Connecticut River Coastal Conservation District, Inc			

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2.2 Describe any Public Involvement/Participation activities planned for the next year, if applicable.

It is anticipated that the Connecticut River Coastal Conservation District, Inc. will continue to recruit and train volunteers from the community to collect weekly water samples of the Coginchaug watershed for bacteria testing.

2.3 Public Involvement/Participation reporting metrics

Metrics	Implemented	Date	Posted
2017 - Availability of the 2017 Stormwater Management Plan announced to public	Yes	03/28/2017	Town Website
2018 - Availability of 2017 Annual Report to the public	Yes	02/21/2018	Town Website
2019 - Availability of 2018 Annual Report to the public	Yes	03/06/2019	Town Website
2020 - Availability of 2019 Annual Report to the public	Yes	06/02/2020	Town Website

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3. Illicit Discharge Detection and Elimination (Section 6(*a*)(3) and Appendix B / page 22)

3.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Responsible Person and Department	Due	Date completed or projected completion date	Additional details
3-1 Develop written IDDE program	In Progress	A written IDDE program using the IDDE program template available from the CT DEEP is being developed.	Develop written plan of IDDE program	Board of Selectmen and Nathan L. Jacobson & Associates, Inc., Town Engineer	July 01, 2018	Anticipate completing by July 01, 2020.	Bill Milardo, Assistant Health Director and Sanitarian, Health Department will be the listed contact.
3-2 Develop list and maps of all MS4 stormwater outfalls in priority areas	In Progress	MS4 stormwater outfall mapping was conducted in January 2016. The stormwater outfall mapping was compiled on a ESRI GIS layer. The MS4 stormwater outfall mapping will be updated to include impaired waters as contained in the State of Connecticut, Department of Energy and Environmental Protection 2018 Integrated Water Quality Report. The stormwater outfalls in the impaired waters will be identified.	Development of an ESRI GIS map layer with MS4 stormwater outfalls.	Board of Selectmen and Nathan L. Jacobson & Associates, Inc., Town Engineer	July 01, 2019	Anticipate completing by July 01, 2020.	
3-3 Implement citizen reporting program	In Place	A program to allow the general public to report suspected illicit discharges is in place on the town website main page Requests for Citizen Service at http://www.townofdurhamct.org/	Request for Citizen Service Reporting Form	Laura Francis, First Selectwoman, Board of Selectmen	July 01, 2017	July 01, 2017.	All public health related inquiries are followed up by Bill Milardo, Assistant Health Director and Sanitarian, Health Department.

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3-4 Establish legal authority to prohibit illicit discharges	Completed	An Illicit Discharge Detection and Elimination Ordinance and Citation Hearing Procedure was enacted at a Town Meeting on October 04, 2010.	IDDE Ordinance and Citation Hearing Procedure Enacted	Laura Francis, First Selectwoman, Board of Selectmen	July 01, 2018	October 04, 2010	
3-5 Develop record keeping system for IDDE tracking	Completed	A program to allow the general public to report suspected illicit discharges is in place on the town website main page Requests for Citizen Service at http://www.townofdurhamct.org/	In Place	Bill Milardo, Assistant Health Director, and Sanitarian, Health Department	July 01, 2018	July 01, 2017	All public health related inquiries are followed up by Bill Milardo, Assistant Health Director and Sanitarian, Health Department and summarized in an annual report.
3-6 Address IDDE in areas with pollutants of concern	Completed	Suspected illicit discharges are followed up by Bill Milardo, Assistant Health Director and Sanitarian.	In Place	Bill Milardo, Assistant Health Director and Sanitarian, Health Department and Nathan L. Jacobson & Associates, Inc., Town Engineer	July 01, 2018	July 01, 2017	

3.2 Describe any IDDE activities planned for the next year, if applicable.

The written IDDE Program will be developed and posted on the town website and a link listed in each Annual Report.

The town will update the written IDDE program as needed throughout the permit term.

Bill Milardo, Assistant Health Director and Sanitarian of the Health Department will maintain the master IDDE tracking spreadsheet.

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3.3 List of citizen reports of suspected illicit discharges received during this reporting period.

Date of Report	Location / suspected source	Response taken
2017 - No suspected illicit discharges to the Town of Durham MS4 were reported according to Bill Milardo, Assistant Health Director and Sanitarian.	Not Applicable	None Required
2018 - No suspected illicit discharges to the Town of Durham MS4 were reported according to Bill Milardo, Assistant Health Director and Sanitarian.	Not Applicable	None Required
2019 - No suspected illicit discharges to the Town of Durham MS4 were reported according to Bill Milardo, Assistant Health Director and Sanitarian.	Not Applicable	None Required

3.4 Provide a record of illicit discharges occurring during the reporting period and SSOs occurring July 2012 through end of reporting period using the following table.

Location (Lat long/ street crossing /address and receiving water)	**Date and duration of occurrence**	**Discharge to MS4 or surface water**	**Estimated volume discharged**	**Known or suspected cause / Responsible party**	**Corrective measures planned and completed** (include dates)	**Sampling data** (if applicable)
349 Main Street Commercial Property	Intermittent	Possible intermittent discharge to	Minimal	Property Owner	Bill Milardo, Assistant Health Director and Sanitarian, Health Department	Not Applicable

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		ConnDOT MS4			has been working with the owner and owner's engineer to develop a long-term solution.	

3.5 Briefly describe the method used to track illicit discharge reports, responses to those reports, and who was responsible for tracking this information.

A program to allow the general public to report suspected illicit discharges is in place on the town website main page Requests for Citizen Service. Bill Milardo, Assistant Health Director and Sanitarian, Health Department follows up on all Citizen Service Requests relating to public health and responds accordingly as required by the Connecticut Public Health Code.

3.6 Provide a summary of actions taken to address septic failures using the table below.

Location and nature of structure with failing septic systems	Actions taken to respond to and address the failures	Impacted waterbody or watershed, if known
2017 - No subsurface sewage disposal systems were a source of illicit discharges to the Town of Durham MS4 according to Bill Milardo, Assistant Health Director and Sanitarian.	None required	None
2018 - No subsurface sewage disposal systems were a source of illicit discharges to the Town of Durham MS4 according to Bill Milardo, Assistant Health Director and Sanitarian.	None required	None
2019 - No subsurface sewage disposal systems were a source of illicit discharges to the Town of Durham MS4 according to Bill Milardo, Assistant Health Director and Sanitarian.	None required	None

3.7 IDDE reporting metrics

Metrics	
Estimated or actual number of MS4 outfalls	235 Field Located

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Estimated or actual number of interconnections	To Be Determined
Outfall mapping complete	100%
Interconnection mapping complete	0%
System-wide mapping complete (detailed MS4 infrastructure)	100%
Outfall assessment and priority ranking	0%
Dry weather screening of all High and Low priority outfalls complete	2017 - 0% 2018 - 0% Dry weather screenings of outfalls was scheduled for the Fall of 2018. However, unseasonably rainfall conditions precluded the development of dry weather condition coincident with low groundwater conditions. 2019 - 0% Dry weather screenings of outfalls was scheduled for the Fall of 2019. However, unseasonably rainfall conditions precluded the development of dry weather condition coincident with low groundwater conditions.
Catchment investigations complete	0%
Estimated percentage of MS4 catchment area investigated	90%

3.8 Briefly describe the IDDE training for employees involved in carrying out IDDE tasks including what type of training is provided and how often is it given (minimum once per year).

The Highway Department will be provided with a copy of the publication entitled *Illicit Discharge Detection and Elimination Manual, A Handbook for Municipalities*, Published January 2003 by the New England Interstate Water Pollution Control Commission.

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4. Construction Site Runoff Control (Section 6(a)(4) / page 25)

4.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Responsible Person and Department	Due	Date completed or projected completion date	Additional details
4-1 Implement, upgrade, and enforce land use regulations or other legal authority to meet requirements of MS4 General Permit	To be Initiated in 2020	Not Applicable	The requirements contained in Minimum Control Measure No. 4 - Construction Site Runoff Control will be forwarded to will be forwarded to Robin Newton, Town Planner and Zoning Enforcement Officer.	Planning and Zoning Commission and Geoffrey L. Colegrove/Robin Newton, Town Planner and Zoning Enforcement Officer	July 01, 2019	July 01, 2020	It is anticipated that UConn CLEAR and/or a Regional Planning Agency will provide a Construction Site Runoff Control template for use by all MS4 Towns.
4-2 Develop/Implement plan for interdepartmental coordination in site plan review and approval	Ongoing	Nathan L. Jacobson & Associates, Inc., Town Engineer, prepares land use review letters for most applications for the Inland Wetlands Commission, Planning Commission and Zoning Commission.	Interdepartmental Coordination	Planning and Zoning Commission and Geoffrey L. Colegrove/Robin Newton, Town Planner and Zoning Enforcement Officer	July 01, 2017	Ongoing	
4-3 Review site plans for stormwater quality concerns	Ongoing	Nathan L. Jacobson & Associates, Inc., Town Engineer, encourages the use of LID BMPs as contained in the 2004 Connecticut Stormwater Quality Manual.	Compliance	Brian C. Curtis, P.E., Town Engineer, Nathan L. Jacobson & Associates, Inc.	July 01, 2017	Ongoing	

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4-4 Conduct site inspections	Ongoing	The town conducts construction site inspections for proper implementation and maintenance of soil erosion and sediment control measures.	Compliance with Approved Plans	Brian C. Curtis, P.E., Town Engineer, Nathan L. Jacobson & Associates, Inc.	July 01, 2017	Ongoing	
4-5 Implement procedure to allow public comment on site development	Ongoing	The land use application process allows for public comment on land use applications which are submitted to the Inland Wetlands Agency and the Planning & Zoning Commission during the Public Hearing Process when applicable.	Compliance	Geoffrey L. Colegrove/Robin Newton, Town Planner and Zoning Enforcement Officer and Planning and Zoning Commission	July 01, 2017	Ongoing	
4-6 Implement procedure to notify developers about the CT DEEP Construction Stormwater General Permit	Ongoing	Since the inception of the MS4 program Nathan L. Jacobson & Associates, Inc., Town Engineer, has made developer's engineers aware of the need to register for the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities in engineering review letters which are typically prepared as part of the land use application process.	Awareness of the need to register for the General permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities	Brian C. Curtis, P.E., Town Engineer, Nathan L. Jacobson & Associates, Inc.	July 01, 2017	Ongoing	

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4.2 Describe any Construction Site Runoff Control activities planned for the next year, if applicable.

There have been no significant land development projects that disturbed greater than five acres in several years. Any land development projects are monitored closely to ensure that the soil and erosion control measures are appropriate, properly sized and located and properly maintained throughout the construction process.

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5. Stormwater Management (Section 6(*a*)(5) / page 27)

5.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Responsible Person and Department	Due	Date completed or projected completion date	Additional details
5-1 Establish and/or update legal authority and guidelines regarding Low Impact Development (LID) and runoff reduction in site development planning	Under Development	The land use regulations will be revised to incorporate the requirements contained in Minimum Control Measure No. - Post-Construction Runoff Control.	The requirements contained in Minimum Control Measure No. 5 - Post-Construction Runoff Control will be forwarded to Robin Newton, Town Planner and Zoning Enforcement Officer.	Geoffrey L. Colegrove/Robin Newton, Town Planner and Zoning Enforcement Officer and Planning and Zoning Commission	July 01, 2021	July 01, 2021	It is anticipated that UConn CLEAR and/or a Regional Planning Agency will provide a Post-construction Stormwater Management template for use by all MS4 Towns.
5-2 Enforce LID/runoff reduction requirements for development and redevelopment projects	Ongoing	Brian C. Curtis, P.E. requires utilization of LID/Runoff Reduction measures in all new development.	Compliance	Brian C. Curtis, P.E., Town Engineer, Nathan L. Jacobson & Associates, Inc.	July 01, 2019	July 01, 2017	
5-3 Identify retention and detention ponds in priority areas	Ongoing	Retention Ponds, Detention Ponds and Hydrodynamic Separators will be inventoried. A GIS Map Layer will be created after the inventory. Part of the inventory process will be facility maintenance requirements.		John Jenkins, Road Foreman, Highway Department and Brian C. Curtis, P.E., Town Engineer, Nathan L. Jacobson & Associates, Inc.	July 01, 2019	July 01, 2017	

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5-4 Implement long-term maintenance plan for stormwater basins and treatment structures	Under Development	A Post-Construction Stormwater Management Facility Operation and Maintenance Plan Manual with an Effective Date of July 01, 2019 was developed. It is anticipated that measures contained in the plan will begin implementation in 2010.		John Jenkins, Road Foreman, Highway Department and Brian C. Curtis, P.E., Town Engineer, Nathan L. Jacobson & Associates, Inc.	July 01, 2019	July 01, 2020	
5-5 DCIA mapping	Completed	Completed the process of DCIA Mapping from base mapping prepared by UConn CLEAR.	The DCIA to MS4 stormwater outfalls discharging to waters identified as impaired in the 2016 Integrated Water Quality Report and in watersheds with a DCIA of greater than 11 percent will start in 2018.	Nathan L. Jacobson & Associates, Inc., Town Engineer	July 01, 2020	February 2019	
5-6 Address post-construction issues in areas with pollutants of concern	To Be Developed	2017 - None 2018 - None 2019 - None	Stormwater outfalls discharging to waters identified as impaired in the 2016 Integrated Water Quality Report and in watersheds with a DCIA of greater	Nathan L. Jacobson & Associates, Inc., Town Engineer	Not specified		

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			than 11 percent will be subject to enhanced water quality treatment.				

5.2 Describe any Post-Construction Stormwater Management activities planned for the next year, if applicable.

Procedures outlined in the Post-Construction Stormwater Management Facility Operation & Maintenance Plan Manual will be implemented in 2020.

5.3 Post-Construction Stormwater Management reporting metrics

Metrics	
Baseline (2012) Directly Connected Impervious Area (DCIA)	8.29 Acres
DCIA disconnected (redevelopment plus retrofits)	2012 to 2016 - To Be Determined 2017 - 0 Acres 2018 - 0 Acres 2019 - 0 Acres Total - To Be Determined
Retrofits completed	2012 to 2016 - To Be Determined 2017 - 0 Acres 2018 - 0 Acres 2019 - 0 Acres Total - To Be Determined
DCIA disconnected	2012 to 2016 - To Be Determined 2017 - 0% 2018 - 0% 2019 - 0% Total - To Be Determined
Estimated cost of retrofits	To Be Determined
Detention or retention ponds identified	0 this year / 0 total

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5.4 Briefly describe the method to be used to determine baseline DCIA.

Based on information contained in the Factsheet: *Town of Durham Water Quality and Stormwater Summary,* prepared by the CT DEEP, 898.33 acres of the town has an impervious area exceeding 12% which is approximately 5.90% of the town. 361.20 acres have an impervious cover of ranging from 12% to 25%, 388.82 acres have an impervious cover ranging from 26% to 50%, 101.01 acres have an impervious cover ranging from 51% to 75% and 47.30 acres have an impervious cover ranging from 76% to 100%.

Based on information contained in the MS4 mapping tab of Connecticut Environmental Conditions Online The impervious surface area consists of 196.77 acres of buildings, 255.69 acres of roads and 387.09 acres of other impervious surfaces for a total impervious surface area of 839.55 acres. The impervious road area of 255.69 acres consists of 193.80 acres of Town roads and 61.89 acres of State roads. The State road area constitutes approximately 24.2% of the total road area.

The DCIA Mapping was conducted in substantial accordance with the methodologies presented in the October 25, 2017 UConn CLEAR Webinar entitled *CT MS4 Mapping Details, Clarifications and Tools,* the October 19, 2018 UConn CLEAR Workshop entitled *CT MS4 Mapping Workshop* as well as information contained in the EPA reference entitled *Estimating Change in Impervious Area (IA) and Directly Connected Impervious Area (DCIA) for Massachusetts Small MS4 Permit utilizing Sutherland Equations*.

The DCIA computations were prepared utilizing Connecticut Environmental Conditions Online MS4 base mapping prepared by UConn CLEAR.

Impaired waters were determined from the reports entitled *2016 Integrated Water Quality Report*, dated April 2017 and *2018 Integrated Water Quality Report*, dated August 01, 2019, prepared by the State of Connecticut Department of Energy and Environmental Protection.

The method to determine the 2012 baseline DCIA was to first compile the CT DEEP drainage basin characteristics in a Microsoft Excel spreadsheet. Information on the Connecticut Environmental Conditions Online MS4 Mapping was used to determine the impervious area breakdown as Buildings, Roads and Other. For CT DEEP drainage basins that fell in two or more municipalities the advanced mapping tab of Connecticut Environmental Conditions Online was used to delineate and determine the applicable town CT DEEP basin area. It was assumed that the entire drainage basin characteristics were directly proportional to the applicable town CT DEEP drainage basin area.

In that ConnDOT has a MS4 Stormwater Program which applies to state owned roads and facilities which the town has no control over, it was decided that the impervious state road area would be determined and deducted from the total impervious road area for each CT DEEP drainage basin as the impervious road areas associated with state highways and facilities constitutes a considerable portion of the total town impervious road area.

The ConnDOT state highway, parking lot and facility impervious road areas were then determined for each CT DEEP drainage basin.

The ConnDOT state highway, parking lot and facility impervious road areas were then deducted from the total town impervious road area to determine a town owned impervious road area for each CT DEEP drainage basin.

Subsequent to the above deduction, the total impervious area in acres and percentage was then recomputed for each CT DEEP drainage basin.

The DCIA formula for each of four development types was then utilized to compute the DCIA. The impervious area in acres was assigned to each of the four Sutherland equations which were modified for the northeastern United State. The Sutherland equation to be utilized was determined using the following methodology:

For impervious percentage less than 6%:

100% of the impervious area was assigned to the slight connectivity Sutherland Equation where $DCIA\% = 0.01*(IA\%)^{2.0}$

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For an impervious area between 6% and 12 %:

50% of the area was assigned to the partial connectivity Sutherland Equation where $DCIA\% = 0.04*(IA\%)^{1.7}$
and
50% was assigned to the average connectivity Sutherland Equation where $DCIA\% = 0.10*(IA\%)^{1.5}$

For an impervious area between 12% and 18 %:

50% of the area was assigned to the average connectivity Sutherland Equation where $DCIA\% = 0.10*(IA\%)^{1.5}$
and
50% was assigned to the high connectivity Sutherland Equation where $DCIA\% = 0.40*(IA\%)^{1.2}$

For an impervious area of greater than 18 %:

100% of the area was assigned to the high connectivity Sutherland Equation where $DCIA\% = 0.40*(IA\%)^{1.2}$

The DCIA for each CT DEEP drainage basin was then summed to determine the entire town DCIA.

Subsequent to completion of 2012 Baseline DCIA computations, UConn CLEAR Mapping available on Connecticut Environmental Conditions Online (CT ECO) was revised to separate road impervious area into State Road Impervious Area (Acres) and Town Road Impervious Area (Acres).

The original 2012 Baseline DCIA computations were revised utilizing the UConn CLEAR State Road Impervious Area (Acres) and Town Road Impervious Area (Acres). No major 2012 Baseline DCIA computation discrepancies were noted.

Land use files will be reviewed to determine disconnection of DCIA since July 01, 2012 for utilization in reaching the CT DEEP goal of 2% disconnection of DCIA by June 30, 2022.

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6. Pollution Prevention/Good Housekeeping (Section 6(*a*)(6) / page 31)

6.1 BMP Summary

BMP	Status	Activities in current reporting period	Measurable goal	Responsible Person and Department	Due	Date completed or projected completion date	Additional details
6-1 Develop/implement formal employee training program	Ongoing	2017 - None 2018 - DPW snow plow drivers attended the Snow Plow Safety Program offered by the Connecticut Interlocal Risk Management Agency (CIRMA). 2019 - None	Compliance	John Jenkins, Road Foreman, Highway Department and Nathan L. Jacobson & Associates, Inc., Town Engineer	July 01, 2017	July 01, 2018	
6-2 Implement MS4 property and operations maintenance	Ongoing	Continuing	Compliance	John Jenkins, Road Foreman, Highway Department	July 01, 2018	July 01, 2017	
6-3 Implement coordination with interconnected MS4s	Ongoing	The Town of Durham continued to coordinate MS4 responsibilities with the Towns of Middlefield, Middletown, Haddam, Killingworth, Madison, Guilford, North Branford and Wallingford as well as Conn DOT.	Compliance	John Jenkins, Road Foreman, Highway Department	July 01, 2017	July 01, 2017	
6-4 Develop/implement program to control other sources of pollutants to the MS4	To Be Developed	2017 - None 2018 - None 2019 - None		Brian C. Curtis, P.E., Town Engineer, Nathan L. Jacobson & Associates, Inc.	July 01, 2017	Anticipate developing and implementing by July 01, 2020.	

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6-5 Evaluate additional measures for discharges to impaired waters*	To Be Developed	2017 - None 2018 - None 2019 - None		Brian C. Curtis, P.E., Town Engineer, Nathan L. Jacobson & Associates, Inc.	July 01, 2017	Anticipate developing and implementing by July 01, 2020.	
6-6 Track projects that disconnect DCIA	Ongoing	2017 - None 2018 - None 2019 - None	Compliance	Nathan L. Jacobson & Associates, Inc., Town Engineer	July 01, 2017		
6-7 Implement infrastructure repair/rehab program	To Be Developed	2017 - None 2018 - None 2019 - None		John Jenkins, Road Foreman, Highway Department, and Nathan L. Jacobson & Associates, Inc., Town Engineer	July 01, 2021	Anticipate developing and implementing by July 01, 2021.	
6-8 Develop/implement plan to identify/prioritize retrofit projects	To be Developed	2017 - None 2018 - None 2019 - None		John Jenkins, Road Foreman, Highway Department and Nathan L. Jacobson & Associates, Inc., Town Engineer	July 01, 2020	Anticipate developing and implementing by July 01, 2020.	
6-9 Implement retrofit projects to disconnect 2% of DCIA	To be Developed	2017 - None 2018 - None 2019 - None		John Jenkins, Road Foreman, Highway Department	July 01, 2022		
6-10 Develop/implement street sweeping program	Ongoing	The Town of Durham currently implements a road sweeping program whereby all town roads are swept at least one time per year.	Compliance	John Jenkins, Road Foreman, Highway Department	July 01, 2017		

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6-11 Develop/implement catch basin cleaning program	Ongoing	The Town of Durham currently implements a catch basin cleaning program whereby all 1,328 catch basins are cleaned every year.	Compliance	John Jenkins, Road Foreman, Highway Department	July 01, 2020		
6-12 Develop/implement snow management practices	Ongoing	2017 – None 2018 - DPW snow plow drivers attended the Snow Plow Safety Program offered by the Connecticut Interlocal Risk Management Agency (CIRMA). 2019 - None	DPW employees are encouraged to continue attending continuing education on snow plow methods.	John Jenkins, Road Foreman, Highway Department	July 01, 2018	2018	

6.2 Describe any Pollution Prevention/Good Housekeeping activities planned for the next year, if applicable.

All Pollution Prevention/Good Housekeeping activities will continue through 2020.

6.3 Pollution Prevention/ Good Housekeeping reporting metrics

Metrics	
Employee training provided for key staff	DPW employees are encouraged to attend training offered by the Connecticut Technology Transfer Center and Connecticut Interlocal Risk Management Agency (CIRMA).
Street sweeping	
Lane miles swept	2017 through 2019 120.92 (60.46 Road Miles) A used Elgin road sweeper was purchased by the town in 2018 as the road sweeping loads are low due to the use of treated salt deicing material.

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Volume (or mass) of material collected	2017 - Not Determined 2018 - 50± C.Y. to 100± C.Y. 2019 - 50± C.Y. to 100± C.Y. Due to the fact that no sand is used in the road deicing mix the road sweepings volume is minimal.
Catch basin cleaning	
Total catch basins in priority areas	To be Determined
Total catch basins in MS4	1,328
Catch basins inspected	2017 - 1,328 2018 - 1,328 2019 - 1,328
Catch basins cleaned	2017 - 1,328 2018 - 1,328 2019 - 1,328
Volume (or mass) of material removed from all catch basins	Due to the fact that no sand is used in the road deicing mix the catch basin cleanings volume is minimal. 2017 - 100± C.Y. to 150± C.Y. 2018 - 140± C.Y. 2019 - 120± C.Y.
Volume removed from catch basins to impaired waters (if known)	Due to the fact that no sand is used in deicing the catch basin cleaning volume is minimal. 2017 - Not Estimated 2018 - Not Estimated 2019 - Not Estimated
Snow management	
Type(s) of deicing material used	Deicing Mix Cargill ClearLane® Enhanced Deicer
Total amount of each deicing material applied	Winter 2017 to 2018 - 1,500± Tons Winter 2018 to 2019 - 1,400± Tons Winter 2019 to 2020 - 1,000± Tons (Estimated)
Type(s) of deicing equipment used	Seven 40,000 Pound, two 15,000 Pound, one 12,000 Pound and one 10,000 Pound GVW Snow Plows/Spreaders. Five of the 40,000 Pound GVW spreaders are ground speed controlled with a application rate ranging from 100 pounds per lane mile to 900 pounds per lane mile with an average application rate of 300 pounds per lane mile.
Lane-miles treated	120.92 (60.46 Road Miles)
Snow disposal location	Along road shoulders. Allyn Park and White's Farm Open Space Property during extremely rare snow events.

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Staff training provided on application methods & equipment	2017 - None 2018 - Connecticut Interlocal Risk Management Agency (CIRMA) Snow Plow Safety Training. 2019 - None It is anticipated that staff training will be conducted in 2020.
Municipal turf management program actions (for permittee properties in basins with N/P impairments)	
Reduction in application of fertilizers (since start of permit)	2017 - 90 % 2018 - 90% 2019 - 90% No fertilizers or weed killers are used on town property with the exception of the Town Green where an organic based fertilizer is used.
Reduction in turf area (since start of permit)	2017 - 0 Acres 2018 - 0 Acres 2019 - 0 Acres
Lands with high potential to contribute bacteria (dog parks, parks with open water, & sites with failing septic systems)	
Cost of mitigation actions/retrofits	$0

6.4 Catch Basin Cleaning Program

Briefly describe the method used to optimize your catch basin inspection and cleaning schedule.
There are 1,328 catch basins in the Town of Durham. 2017 - All catch basins were cleaned. 2018 - All catch basins were cleaned. 2019 - All catch basins were cleaned. As all catch basins are cleaned annually, no optimization methods are required.

6.5 Retrofit program

Briefly describe the Retrofit Program identification and prioritization process, the projects selected for implementation, the rationale for the selection of those projects and the total DCIA to be disconnected upon completion of each project.
Storm Drainage Retrofit prioritization will be given to stormwater outfalls that are known to result in soil erosion and sedimentation. Prioritization will be given to the outfalls within the impaired water drainage basins with particular emphasis placed on stormwater outfalls which are located on fine grained glacial till soils. The retrofit program will be prioritized based on setback distance from watercourse and/or waterbodies.

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Describe plans for continuing the Retrofit program and how to achieve a goal of 1% DCIA disconnection in future years.
The DCIA for the town was computed to be 8.29 acres. The CT DEEP goal is to reduce the DCIA by 1% per year in calendar year 2021 and 2022 which will mean a reduction in DCIA of 0.083 acre per year for a total of 0.166 acre by the end of calendar year 2022. Land use files will be reviewed to determine disconnection of DCIA since July 01, 2012 for utilization in reaching the CT DEEP goal of 2% disconnection of DCIA by June 30, 2022.

Describe plans for continuing the Retrofit program beyond this permit term with the goal to disconnect 1% DCIA annually over the next 5 years.
Redevelopment projects in town will be required to implement LID practices whenever possible to meet or exceed the CT DEEP DCIA disconnection goal.

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Part II: Impaired waters investigation and monitoring

1. Impaired waters investigation and monitoring program

1.1 Indicate which stormwater pollutant(s) of concern occur(s) in your municipality or institution. This data is available on the MS4 map viewer: .

Nitrogen/ Phosphorus ☐ Bacteria ☒ Mercury ☐ Other Pollutant of Concern ☐

The Coginchaug River is the only impaired water in town.

1.2 Describe program status.

Discuss 1) the status of monitoring work completed, 2) a summary of the results and any notable findings, and 3) any changes to the Stormwater Management Plan based on monitoring results.
2017 - No stormwater sampling to impaired waters was conducted. 2018 - No stormwater sampling to impaired waters was conducted. It was anticipated to conduct dry weather screening and sampling during the Fall of 2018. However, unseasonably high precipitation precluded dry weather screening and sampling. It was anticipated that dry weather screening and sampling will be conducted in the Fall of 2019. 2019 - No stormwater sampling to impaired waters was conducted. It was anticipated to conduct dry weather screening and sampling during the Fall of 2019. However, unseasonably high precipitation precluded dry weather screening and sampling. It was anticipated that dry weather screening and sampling will be conducted in the Fall of 2020. It is anticipated that dry weather screening stormwater sampling of at least half of the stormwater outfalls which discharge directly to impaired waters (Coginchaug River) will be completed in the late Spring and early Summer of 2020.

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2. Screening data for outfalls to impaired waterbodies (Section 6(i)(1) / page 41)

2.1 Screening data collected under 2017 permit

Complete the table below for any outfalls screened during the reporting period. Each Annual Report will add on to the previous year's screening data showing a cumulative list of outfall screening data.

Outfall ID	**Sample date**	**Parameter** (Nitrogen, Phosphorus, Bacteria, or Other pollutant of concern)	**Results**	**Name of Laboratory (if used)**	**Follow-up required?**

2017 - No sampling was conducted.

2018 - No sampling was conducted.

2019 - No sampling was conducted.

All outfalls which discharge directly to the Coginchaug River will be sampled in 2020.

2.2 Credit for screening data collected under 2004 permit

If any outfalls to impaired waters were sampled under the 2004 MS4 permit, that data can count towards the monitoring requirements under the modified 2017 MS4 permit. Complete the table below to record sampling data for any outfalls to impaired waters under the 2004 MS4 permit.

Outfall	**Sample date**	**Parameter** (Nitrogen, Phosphorus, Bacteria, or Other pollutant of concern)	**Results**	**Name of Laboratory (if used)**	**Follow-up required?**
DR3	11/02/06	E. coli (colonies/100 ml) Total Coliform	320 >4,000	Phoenix Environmental	
DR3	12/01/06	E. coli (colonies/100 ml) Total Coliform	50 >600	Phoenix Environmental	
DR3	11/26/07	E. coli (colonies/100 ml) Total Coliform	10 >1,000	Phoenix Environmental	
DR3	01/11/08	E. coli (colonies/100 ml) Total Coliform	40 320	Phoenix Environmental	
DR3	04/28/08	E. coli (colonies/100 ml) Total Coliform	80 160	Phoenix Environmental	
DR3	11/20/09	E. coli (colonies/100 ml) Total Coliform	450 >24,200	Phoenix Environmental	
DR3	11/04/10	E. coli (colonies/100 ml) Total Coliform	290 6,870	Phoenix Environmental	
DR3	09/23/11	E. coli (colonies/100 ml) Total Coliform	24,200 >24,200	Phoenix Environmental	

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DR3	11/01/13	E. coli (colonies/100 ml) Total Coliform	70 >24,200	Phoenix Environmental	
DR3	12/23/13	E. coli (colonies/100 ml) Total Coliform	80 >24,200	Phoenix Environmental	
DR3	10/01/14	E. coli (colonies/100 ml) Total Coliform	9,210 >24,200	Phoenix Environmental	
DR3	12/22/15	E. coli (colonies/100 ml) Total Coliform	1,130 Not Tested	Phoenix Environmental	
DR3	11/15/16	E. coli (colonies/100 ml) Total Coliform	730 Not Tested	Phoenix Environmental	
DR4	11/02/06	E. coli (colonies/100 ml) Total Coliform	<20 >4,000	Phoenix Environmental	
DR4	12/01/06	E. coli (colonies/100 ml) Total Coliform	60 500	Phoenix Environmental	
DR4	01/11/08	E. coli (colonies/100 ml) Total Coliform	60 1,040	Phoenix Environmental	
DR4	04/28/08	E. coli (colonies/100 ml) Total Coliform	>1,000 >2,000	Phoenix Environmental	
DR4	11/20/09	E. coli (colonies/100 ml) Total Coliform	360 >24,200	Phoenix Environmental	
DR4	11/04/10	E. coli (colonies/100 ml) Total Coliform	19,860 >24,200	Phoenix Environmental	
DR4	09/23/11	E. coli (colonies/100 ml) Total Coliform	4,610 >24,200	Phoenix Environmental	
DR4	12/23/13	E. coli (colonies/100 ml) Total Coliform	2,100 >24,200	Phoenix Environmental	
DR4	10/01/14	E. coli (colonies/100 ml) Total Coliform	5,170 >24,200	Phoenix Environmental	
DR4	12/22/15	E. coli (colonies/100 ml) Total Coliform	660 Not Tested>	Phoenix Environmental	
DR4	11/15/16	E. coli (colonies/100 ml) Total Coliform	>2,000 Not Tested	Phoenix Environmental	

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3. Follow-up investigations (Section 6(i)(1)(D) / page 43)

Provide the following information for outfalls exceeding the pollutant threshold.

Outfall	Status of drainage area investigation	Control measure implementation to address impairment

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4. Prioritized outfall monitoring (Section 6(i)(1)(D) / page 43)

Once outfall screening has been completed for at least 50% of outfalls to impaired waters, identify 6 of the highest contributors of any pollutants of concern. Begin monitoring these outfalls on an annual basis by July 01, 2020.

Outfall	Sample Date	Parameter(s)	Results	Name of Laboratory (if used)

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Part III: Additional IDDE Program Data

1. Assessment and Priority Ranking of Catchments data (Appendix B (A)(7)(c) / page 5)

Provide a list of all catchments with ranking results (DEEP basins may be used instead of manual catchment delineations).

1. Catchment ID (DEEP Basin ID)	2. Category	3. Rank
4605-01-2-R3 15.49% Impervious		
4606-00-2-R2 13.80% Impervious		
4605-00-2-L1 11.31% Impervious		

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2. Outfall and Interconnection Screening and Sampling data (Appendix B (A)(7)(d) / page 7)

2.1 Dry weather screening and sampling data from outfalls and interconnections

Provide sample data for outfalls where flow is observed. Only include Pollutant of concern data for outfalls that discharge into stormwater impaired waterbodies.

Outfall / Interconnection ID	Screening / sample date	Ammonia	Chlorine	Conductivity	Salinity	E. coli or enterococcus	Surfactants	Water Temp	Pollutant of concern	If required, follow-up actions taken

2017- No Dry Weather Screening and sampling was conducted

2018 - Dry weather screening and sampling of outfalls, where appropriate, was scheduled for the Fall of 2018. However, unseasonably rainfall conditions precluded the development of the dry weather conditions coincident with low groundwater conditions to facilitate dry weather screening and sampling.

2019 - Dry weather screening and sampling of outfalls, where appropriate, was scheduled for the Fall of 2019. However, unseasonably rainfall conditions precluded the development of the dry weather conditions coincident with low groundwater conditions to facilitate dry weather screening and sampling.

It is anticipated that dry weather screening and sampling of outfalls where appropriate will be conducted in late Spring and early Summer 2020.

2.2 Wet weather sample and inspection data

Provide sample data for outfalls and key junction manholes of any catchment area with at least one System Vulnerability Factor.

Outfall / Interconnection ID	Sample date	Ammonia	Chlorine	Conductivity	Salinity	E. coli or Enterococcus	Surfactants	Water Temp	Pollutant of concern

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3. Catchment Investigation data (Appendix B (A)(7)(e) / page 9)

3.1 System Vulnerability Factor Summary

For those catchments being investigated for illicit discharges (i.e. categorized as high priority, low priority, or problem) document the presence or absence of System Vulnerability Factors (SVF). If present, report which SVF's were identified. An example is provided below.

Outfall ID	Receiving Water	System Vulnerability Factors

Where SVFs are:

1. History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages.
2. Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs.
3. Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints.
4. Common or twin-invert manholes serving storm and sanitary sewer alignments.
5. Common trench construction serving both storm and sanitary sewer alignments.
6. Crossings of storm and sanitary sewer alignments.
7. Sanitary sewer alignments known or suspected to have been constructed with an underdrain system;
8. 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.
9. Areas formerly served by combined sewer systems.
10. Any sanitary sewer and storm drain infrastructure greater than 40 years old in medium and densely developed areas.
11. 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 that poor owner maintenance).
12. History of multiple local health department or sanitarian actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather that poor owner maintenance).

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3.2 Key junction manhole dry weather screening and sampling data

Key Junction Manhole ID	Screening / Sample date	Visual / olfactory evidence of illicit discharge	Ammonia	Chlorine	Surfactants

2017- No Dry Weather Screening and sampling was conducted

2018 - Dry weather screening and sampling of outfalls was scheduled for the Fall of 2018. However, unseasonably rainfall conditions precluded the development of the dry weather conditions coincident with low groundwater conditions to facilitate dry weather screening and sampling.

2019 - Dry weather screening and sampling of outfalls was scheduled for the Fall of 2019. However, unseasonably rainfall conditions precluded the development of the dry weather conditions coincident with low groundwater conditions to facilitate dry weather screening and sampling.

It is anticipated that dry weather screening and sampling of outfalls where appropriate will be conducted in late Spring and early Summer 2020.

3.3 Wet weather investigation outfall sampling data

Outfall ID	Sample date	Ammonia	Chlorine	Surfactants

3.4 Data for each illicit discharge source confirmed through the catchment investigation procedure

Discharge location	Source location	Discharge description	Method of discovery	Date of discovery	Date of elimination	Mitigation or enforcement action	Estimated volume of flow removed

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Part IV: Certification

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."	
Chief Elected Official or Principal Executive Officer	Document Prepared by
Print Name: Laura L. Francis, First Selectwoman Signature:	Print Name: Wade M. Thomas, CPMSM Signature:
Date: July , 2020	Date: July , 2020