Retrofit Program Plan Guidance Document For Pathogen Impaired Watershed MS4s on Long Island

New York State Department of Environmental Conservation

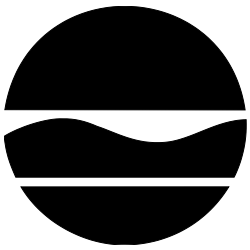

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Table of Contents

List of Tables:

1.0 Introduction

Sections 301, 303 and 304 of the Clean Water Act (CWA), require states to identify all waterbodies that do not meet applicable water quality standards and therefore are considered impaired and placed on the 303(d) list of impaired waters. The CWA requires states to establish EPA-approvable total maximum daily loads (TMDLs) for these impaired waterbodies which, when implemented, will achieve water quality standards.

The 2002, 2004 and 2006 New York State Section 303(d) list of impaired waterbodies identified pathogens as the pollutant of concern for numerous waterbodies in Long Island. As a result the following TMDL studies were completed:

- *Pathogen Total Maximum Daily Loads for Shellfish Waters in Oyster Bay Harbor and Mill Neck Creek, September 2003*
- *Peconic Bay Pathogens TMDL, September 2006*
- *Shellfish Pathogen TMDLs for 27 303(d) listed Waters, September 2007*

Part IX.C of the SPDES General Permit for Storm Water Discharges from Municipal Separate Storm Sewer Systems (GP-0-10-002) (also known as the "MS4 permit") contains the pollutant load reductions for these waterbodies and is reproduced in Appendix A of this document. Appendix B to this document illustrates each of these waterbodies, areas of shellfish closures (both uncertified and seasonally uncertified), their contributing watersheds and municipal boundaries of operators of traditional land-use Municipally-owned Separate Storm Sewer Systems (MS4s) within those watersheds. Data layers used to develop the maps in Appendix B are available upon request.

Entities covered under the MS4 permit (hereinafter MS4 Operator(s)) that discharge to these waterbodies must meet the requirements specified in Part III.C.2 – Special Conditions: Impaired Waters and Part IX.C - Watershed Improvement Strategies (WIS) of the MS4 permit to reduce the discharge of pollutants from their separate sewer systems to meet the waste load allocation (WLA) specified in the applicable TMDL. Appendix C provides information on each MS4 Operator's retrofit plan submission requirements.

As set forth in Part IX of the MS4 permit, the effectiveness of the pollutant load reductions in meeting water quality standards will be verified by ambient monitoring of the affected waterbody. Where ambient monitoring demonstrates consistent compliance with water quality standards, MS4 Operators with load reduction goals may request that the Department suspend the additional WIS requirements to install stormwater retrofits.

Since the Department has not disaggregated the TMDL calculated loads, this guidance document describes the information that must be submitted to be considered an approvable retrofit program plan.

Retrofit plans have already been submitted by MS4 Operators that drain to the Oyster Bay Harbor system. This guidance applies to MS4s discharging to the 27 shellfishing areas and the Peconic Estuary TMDL waterbodies.

2.0 TMDL Assumptions

The TMDL studies used the Watershed Treatment Model (WTM) developed by the Center for Watershed Protection (CWP) to estimate the pathogen load for each waterbody studied. The pathogen loads were based on the watershed contributing to the affected waterbody and were distributed as follows:

Table 1 Example format for reporting pathogen load distribution in TMDL

SOURCES	Billion FC/year
POINT SOURCES	
Sewage Treatment Plant	
RESIDENTIAL/URBAN LAND [1,2]	
MS4 Contribution [3]	
Non-MS4 Contribution [4]	
OTHER NONPOINT SOURCES	
Rural Land	
Forest	
Waterfowl	
TOTAL LOAD (Billions)	
Waterbody (ha)	
Billions FC load/ha/yr	
[1]"Urban land" is a combination of residential land, commercial land, industrial land, and roadways	
[2]This source includes the load from domestic pets	
[3] X% of residential/urban load was attributed to MS4 conveyances based on a review of maps in chapter 2 of TMDL report and land use data	
[4]Y% of residential/urban load was attributed to stormwater not flowing through MS4 conveyances	

The modeling approach in the WTM assumed default values for impervious cover (see Table 2) for the different land use classes and assumes a fecal coliform (FC) concentration of 20,000 MPN/100 ml for stormwater run off from impervious surfaces to determine the annual fecal coliform load from urban land. The TMDL studies defined "urban land" to be a combination of residential land, commercial land, industrial and roadways.

In the TMDLs, the MS4 pathogen load is a combination of the urban land use contribution plus a pet waste contribution.

The pet waste contribution was estimated using assumptions based on a national estimate that 36% of households have dogs, each of these households has an average of 1.6 dogs (US Census Bureau, 2004) and each dog contributes 10 billion FC per day.

Table 2 - Watershed Treatment Model Default Values for Primary Sources

Land Use	Impervious Cover (%)
Low density residential	11
Medium density residential	21
High Density Residential	33
Multi Family	44
Commercial	72
Roadway	80
Industrial	53
Forest	0
Rural	0

3.0 State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from MS4s (GP-0-10-002)

The MS4 permit became effective on May 1, 2010. This permit requires MS4 Operators to develop, implement and enforce a stormwater management program plan (SWMP) to reduce the discharge of pollutants from their separate storm sewer systems to the maximum extent practicable (MEP) in order to protect water quality and to satisfy the appropriate water quality requirements of the Environmental Conservation Law (ECL) and CWA. MS4 Operators that discharge to pathogen impaired waterbodies for which TMDLs have been developed must incorporate watershed specific requirements to achieve the pollutant load reductions specified in Table IX-C – Pollutant Load Reduction & Timetable for Pathogen Impaired Watershed Improvement Strategy Areas**.**

This table specifies retrofit plan submission deadlines which are the deadlines by which the retrofit program component of the WIS must be submitted to the Department for review and approval.

4.0 MS4 Load Disaggregation /Assignment

The TMDL studies calculated the allowable load and reduction requirements for pollution contributions as an aggregate and did not specify the individual reduction requirements for each MS4 Operator. In order to determine each MS4 Operator's reduction requirements, the Department must first receive information relating to each MS4 storm-sewershed (hereinafter sewershed) and land use distribution encompassed in the sewershed.

Section 6.0 of this document contains the information that must be included as part of the program plan in order for the Department to determine the individual load reduction requirements for each MS4 Operator. Information relating to the location and areas draining to recharge basins is requested and drainage areas contributing to recharge basins designed to capture and infiltrate the 100 year, 24 hour event will not be considered as part of the sewershed contributing load to the surface water embayment.

The Department intends to use the WTM and the information provided by each MS4 Operator to determine the pathogen load from the urban land in their respective sewersheds.

The pollutant load reduction associated with retrofits and on-going pet waste programs will be credited toward the MS4 pathogen load. MS4 Operators seeking reduction credits for these practices must submit sufficient information to allow the pollutant load reduction to be determined. This information will aid in the development of accurate loads and would benefit the MS4 by providing reduction credits. However, failure to provide such information will not affect whether the plan is approvable.

MS4 Operators that are within the topographic boundaries of a waterbody with retrofit requirements but do not have any outfalls discharging to the impaired (uncertified or seasonally uncertified for shellfishing as shown on the Maps in Appendix B) section of a waterbody should provide written notification to the Department of this fact.

5.0 Load Reduction Responsibilities

The Department intends to use the information provided by the MS4 Operators to determine the individual MS4 responsibilities.

The development of a Regional Stormwater Entity (RSE) is defined in the MS4 permit. Participation in an RSE is voluntary; however, the formation of an RSE will enable resource sharing, as well as enhanced funding opportunities among participating MS4 Operators. An RSE creates flexibility to site retrofits in locations that achieve a better cost-to-pathogen reduction ratio on a watershed basis. For MS4 Operators working in an RSE, the assigned load will be the sum of the individual loads assigned to the participating entities. Information regarding the RSE should be submitted as described in Section 6.0.

Each participating MS4 Operator in the RSE would be deemed in compliance if the RSE

assigned load reduction requirement is met. If the RSE assigned load is not met, each participating member would be deemed in non-compliance until the RSE assigned load is attained.

The MS4 Operators will be notified by the Department of their responsibilities. Once notified, MS4 Operators and RSEs with load reduction requirements must comply with the interim milestone dates contained within the Schedule of Compliance (see Section 6.0)

6.0 Retrofit Program Plan Contents

In order to be considered approvable, the retrofit program plan must contain the following information. Some information, listed as optional, will aid in the development of accurate loads and would benefit the MS4 Operator by providing reduction credits. However, failure to provide such information will not affect whether the plan is approvable.

Background/Introduction

This section should identify the MS4 Operator, include the MS4 permit number and provide other relevant information about the municipality which includes areas of concern for pathogen generation.

Regional Stormwater Entities

This section should identify the existence of any applicable regional stormwater entities and identify the participating MS4s.

Land Use Table

Provide a completed table of land use information using a format similar to that provided in Appendix D. The number of dwelling units must also be included in the data submitted.

Maps

Maps shall be submitted in pdf format. Provided that they are of sufficient quality and proper scale, scanned versions of hardcopy paper maps or maps electronically converted from GIS will be acceptable. Where GIS is used to create the maps, supporting data layers in GIS format should be submitted.

- Outfall locations
  - All outfalls to any and all surface waters located within the topographical watershed of the shellfish impaired segment of the greater waterbody.
  - Interconnections between MS4s, both conventional and non-conventional that contribute flow to the shellfish impaired segment of the embayment.
- Sewershed delineation
  - Map should include recharge basins and their associated drainage area located within the sewershed of the shellfish impaired segment of the greater waterbody.
- Sewer system mapping that has been completed (permit requires 20% per year beginning on the effective date of the MS4 Permit)
- 1-5 foot contours.
- Map scale of 1:200 or better.

Retrofit design data (optional):

- Retrofit Practices Installed (e.g. Dry Swale, Bioretention, etc…)
- Location of Retrofits (reference to map)
- Date Retrofit completed
- Sizing criteria used

    - Area captured by practice
    - Design Storm
    - Water Quality Volume (WQv) provided (full or fraction of WQv)
    - Percent Impervious Area
- Maintenance
    - Inspection reports
    - Maintenance records (regular maintenance, maintenance specified but poorly enforced or no maintenance guidance)
- Soil type
- Depth to groundwater

Pet Waste Management Program Information (optional)

- Average # pets/household
- Seasonal variations in pet population (if known)
- Media type used for public education on pet waste
- Local data on fraction of households with dogs, fraction of owners who walk their dogs, fraction of owners who pick up pet waste, fraction willing to change behavior.

Schedule of Compliance: In order to be considered approvable, the plan must include a schedule for submission of an approvable report describing the policy and procedures the MS4 will use to identify and select retrofit projects. Submission dates for the report may be expressed based on the date of the Departments notification of the load reduction requirements. Upon approval of the report, this schedule will become enforceable under the permit. The following example would satisfy this requirement:

"Within X[1] months of the date of DEC notification of the individual MS4 Operator's responsibilities, the Town/Village/City/RSE will submit a report that describes the policy and procedures for project permitting, design, funding, construction and maintenance. The report will also identify potential funding sources including but not limited to GIGP, Other SRF, NFWF (LIS), PEP, Non-Ag/NPS (EPF), WQIP, and other local funding for work needed to complete retrofit projects. The report will also include a schedule for deliverables with due dates in accordance with 6NYCRR 750-1.14 (not to exceed 9 months between deliverables)."

Example Deliverables Schedule to be included in report (due dates may be modified)

Task	Deliverable	Due Date
Desktop analysis to determine possible retrofit locations	Map data layer showing possible locations	Within 9 months of approval of report
Identification of potential retrofit projects	Inventory & Ranking of proposed projects (see worksheets)	Within 18 months of approval of report
Selection of Retrofit Practices for each year (as necessary)	Approvable Engineering report and concept plan	October 15 each year after inventory and ranking has been reviewed and accepted by the Department
Acquire Funding	Report on activities conducted to acquire funding	Annual Report
Complete Design of selected practices for the year (as necessary)	Plans & Specifications for Construction	January 15 of each year
Commence Construction of selected retrofits for year (as necessary)	Written notice of compliance or noncompliance with the interim date	May 15 of each year
Complete Construction of selected retrofits for year (as necessary)	Written notice of compliance or noncompliance with the interim date	December 15 of each year

[1] The timeframe for submission of the report cannot exceed 9 months from the date of finalization of the individual MS4 load contributions and reduction requirements.

Acronym List

CFR	Code of Federal Regulations
CWA	Center for Watershed Protection
ECL	Environmental Conservation Law
EPA	Environmental Protection Agency
EPF	Environmental Protection Fund
FC	Fecal Coliform
GIGP	Green Infrastructure Grants Program
LIS	Long Island Sound
MEP	Maximum Extent Practicable
MPN	Most Probable Number
MS4	Municipal Separate Storm Sewer System
NFWF	National Fish & Wildlife Foundation
NPS	Non Point Source
NYCRR	New York Codes, Rules & Regulations
PEP	Peconic Estuary Program
TMDL	Total Maximum Daily Load
RSE	Regional Stormwater Entity
SRF	State Revolving Fund
SPDES	State Pollutant Discharge Elimination System
SWMP	Stormwater Management Program
SWMP plan	Stormwater Management Program Plan
WLA	Waste Load Allocation
WQIP	Water Quality Improvement Project Program
WTM	Watershed Treatment Model

References

Caraco Deb, Watershed Treatment Model (WTM) 2010 User's Guide, Center for Watershed Protection, Inc., June 2010

Final Report for Shellfish Pathogen TMDLs for 27 303(d)-listed Waters, September 2007 (http://www.NYSNYSDEC.ny.gov/docs/water_pdf/tmdlpathshel07.pdf)

Final Report for Peconic Bay Pathogens TMDL, September 2006 (http://www.NYSNYSDEC.ny.gov/docs/water_pdf/peconic.pdf)

Hirschman et al. Derivation of Runoff Reduction Rates for select BMPs, Center for Watershed Protection, Inc. April 2008

J. M. Hathaway W. F. Hunt and S. Jadlocki, Indicator Bacteria Removal in Storm-Water Best Management Practices in Charlotte, North Carolina, December 2009, Journal of Environmental Engineering

Pathogen Total Maximum Daily Loads for Shellfish Waters in Oyster Bay Harbor and Mill Neck Creek, Nassau County, New York, September 2003 (http://www.NYSNYSDEC.ny.gov/docs/water_pdf/oystbay.pdf)

Winer Rebecca, National Pollutant Removal Performance Database for Stormwater Treatment Practices, *2nd edition* Center for Watershed Protection Ellicott City, MD, March 2000

Appendix A

SPDES MS4 Permit Part IX.C Pollutant Load Reductions

Pollutant Load Reduction and Timetable for
Pathogen Impaired Watershed Improvement Strategy Areas

	Watershed Improvement Strategy Deadline	Retrofit Plan Submission Deadline	Pollutant Load Reduction (Waste Load Allocation %)	Pollutant Load Reduction Deadline
Budds Pond*	5/1/2013	9/30/2012	61	9/30/2022
Stirling Creek*	5/1/2013	9/30/2012	28	9/30/2022
Town & Jockey Creeks*	5/1/2013	9/30/2012	76	9/30/2022
Goose Creek*	5/1/2013	9/30/2012	70	9/30/2022
Hashamomuck Pond, Zone HP1*	5/1/2013	9/30/2012	77	9/30/2022
Hashamomuck Pond , Zone HP2*	5/1/2013	9/30/2012	43	9/30/2022
Richmond Creek*	5/1/2013	9/30/2012	71	9/30/2022
Deep Hole Creek*	5/1/2013	9/30/2012	29	9/30/2022
James Creek*	5/1/2013	9/30/2012	51	9/30/2022
Flanders Bay	5/1/2012	3/9/2012	98	3/9/2021
Reeves Bay	5/1/2012	3/9/2012	97	3/9/2021
Sebonac Creek	5/1/2012	3/9/2012	58	3/9/2021
North Sea Harbor, Zone NSH1	5/1/2012	3/9/2012	97	3/9/2021
North Sea Harbor, Zone NSH2	5/1/2012	3/9/2012	62	3/9/2021
North Sea Harbor, Zone NSH3	5/1/2012	3/9/2012	99	3/9/2021
North Sea Harbor, Zone NSH5	5/1/2012	3/9/2012	74	3/9/2021
Wooley Pond	5/1/2012	3/9/2012	97	3/9/2021

Noyac Creek, Zone NC1	5/1/2012	3/9/2012	64	3/9/2021
Sag Harbor, Zone SH2*	5/1/2013	9/30/2012	50	9/30/2022
Northwest Creek*	5/1/2013	9/30/2012	76	9/30/2022
Acabonac Harbor, Zone AH2*	5/1/2013	9/30/2012	42	9/30/2022
Acabonac Harbor, Zone AH3*	5/1/2013	9/30/2012	85	9/30/2022
Acabonac Harbor, Zone AH4*	5/1/2013	9/30/2012	81	9/30/2022
Acabonac Harbor, Zone AH5*	5/1/2013	9/30/2012	87	9/30/2022
Montauk Lake, Zone LM1*	5/1/2013	9/30/2012	52	9/30/2022
Montauk Lake, Zone LM2*	5/1/2013	9/30/2012	52	9/30/2022
Montauk Lake, Zone LM3*	5/1/2013	9/30/2012	48	9/30/2022
Little Sebonac Creek	5/1/2012	3/9/2012	70	3/9/2021
Oyster Bay (Harbor 2)	5/1/2012	3/9/2012	20	3/9/2021
Oyster Bay (Harbor 3)	5/1/2012	3/9/2012	90	3/9/2021
Hempstead Harbor, north, and tidal tributaries	5/1/2013	9/30/2012	95	9/30/2022
Cold Spring Harbor, and tidal tributaries, Inner	5/1/2013	9/30/2012	95	9/30/2022
Cold Spring Harbor, Eel Creek	5/1/2013	9/30/2012	90	9/30/2022
Huntington Harbor	5/1/2013	9/30/2012	89	9/30/2022

Centerport Harbor	5/1/2013	9/30/2012	91	9/30/2022
Northport Harbor	5/1/2013	9/30/2012	92	9/30/2022
Stony Brook Harbor and West Meadow Creek	5/1/2013	9/30/2012	99	9/30/2022
Stony Brook Creek	5/1/2013	9/30/2012	99	9/30/2022
Stony Brook Yacht Club	5/1/2013	9/30/2012	48	9/30/2022
Port Jefferson Harbor, North and tribs	5/1/2013	9/30/2012	94	9/30/2022
Conscience Bay and tidal tribs	5/1/2013	9/30/2012	99	9/30/2022
Setauket Harbor, Little Bay	5/1/2013	9/30/2012	84	9/30/2022
Setauket Harbor, East Setauket	5/1/2013	9/30/2012	79	9/30/2022
Setauket Harbor, Poquott	5/1/2013	9/30/2012	100	9/30/2022
Mt. Sinai Harbor, Crystal Brook	5/1/2013	9/30/2012	88	9/30/2022
Mt. Sinai Harbor, Inner Harbor	5/1/2013	9/30/2012	96	9/30/2022
Mt. Sinai Harbor, Pipe Stave Hollow	5/1/2013	9/30/2012	93	9/30/2022
Mattituck Inlet/Creek, Low, and tidal tributaries	5/1/2013	9/30/2012	64	9/30/2022
Goldsmith Inlet	5/1/2013	9/30/2012	91	9/30/2022
West Harbor, Darby Cove	5/1/2013	9/30/2012	41	9/30/2022

Georgica Pond, Upper	5/1/2013	9/30/2012	93	9/30/2022
Georgica Pond, Lower	5/1/2013	9/30/2012	93	9/30/2022
Georgica Pond Cove	5/1/2013	9/30/2012	92	9/30/2022
Sagaponack Pond	5/1/2013	9/30/2012	88	9/30/2022
Mecox Bay and tributaries	5/1/2013	9/30/2012	89	9/30/2022
Heady Creek and tributaries	5/1/2013	9/30/2012	88	9/30/2022
Taylor Creek and tributaries	5/1/2013	9/30/2012	52	9/30/2022
Penny Pond	5/1/2013	9/30/2012	31	9/30/2022
Weesuck Creek and tidal tributaries	5/1/2013	9/30/2012	37	9/30/2022
Penniman Creek and tidal tributaries	5/1/2013	9/30/2012	32	9/30/2022
Ogden Pond	5/1/2013	9/30/2012	28	9/30/2022
Quantuck Bay/Quantuck Creek	5/1/2013	9/30/2012	91	9/30/2022
Quantuck Canal/Moneybogue Bay	5/1/2013	9/30/2012	62	9/30/2022
Seatuck Cove	5/1/2013	9/30/2012	94	9/30/2022
Harts Cove	5/1/2013	9/30/2012	12	9/30/2022
Narrow Bay	5/1/2013	9/30/2012	16	9/30/2022
Bellport Bay, Beaver Dam Creek	5/1/2013	9/30/2012	94	9/30/2022
Bellport Bay, West Cove	5/1/2013	9/30/2012	94	9/30/2022
Patchogue Bay, Swan River	5/1/2013	9/30/2012	90	9/30/2022
Patchogue Bay, Mud Creek	5/1/2013	9/30/2012	71	9/30/2022

*Additionally Designated Area

Appendix B

Pathogen Impaired Watershed Maps

http://www.dec.ny.gov/chemical/92910.html

Appendix C

MS4s within watersheds subject to Part IX.C requirements

http://www.dec.ny.gov/chemical/92910.html

Appendix D

Land Use Data Table

	Land Use (Acres)																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		17
Sewershed (Name/Location)	Low Density (<1du/acre)	Medium Density (1-4 du/acre)	High Density (>4du/acre)	Multifamily	Commercial/Retail	Office/Research	Industrial/Manufacturer/Warehouse	Institutional	Private Recreation/Public Parks	Agricultural	Cemetery	Vacant/Undeveloped	Transportation	Utilities	Forest	Surface Waters	**Total**	# Dwelling Units

Notes:

*If the MS4 Operator has a land use that is not listed in this table, add it to the land use category that it is most similar to and provide a description of the land use and what category it was added to.