

**Municipality/Organization:** Town of Brewster

**EPA NPDES Permit Number:** MAR 041096

**MassDEP Transmittal Number:** X270464

**Annual Report Number & Reporting Period:** Year 15  
April 1, 2017 – March 31, 2018

**NPDES PII Small MS4 General Permit  
Annual Report  
(Due: May 1, 2018)**

**Part I. General Information**

Contact Person: Patrick Ellis

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Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: \_\_\_\_\_



Printed Name: R. Patrick Ellis

Title: Superintendent, Department of Public Works

Date: 4/30/2018

## Part II. Self-Assessment

Brewster is a coastal community with both fresh and salt water resources. The Town is in Phase III of its Integrated Water Resource Management Plan (IWRMP). Phase III will address an evaluation of wastewater and nitrogen management alternatives and the development and finalization of updated by-laws and regulations to implement the stormwater management recommendations developed during Phase II. In November 2015, a revised Stormwater Management Bylaw (chapter 272) was released for public comment. This regulation has revised language regarding controls for erosion and sediment on all development and redevelopment projects. Comments were received both internally and from the general public at public hearings in December 2015 and March 2016. Originally, the Bylaw was proposed for vote at the May 2016 Town Meeting, but additional revision will delay that vote until November 2018.

Work on the IWRMP is ongoing, and has resulted in a wide range of water quality related reports, meetings and presentations. Although Comprehensive Wastewater Management Plans are typically concerned with wastewater, Brewster's Planning Department and Health Department have expanded the program to include water supply and stormwater runoff. Several public hearings have been held and various department heads have attended GIS training classes with the intent of expanding our stormwater records management effort. Educational materials, including a water quality informational display, have been placed at Town Hall. The informational display includes steps that individuals can take to reduce their impact on the environment.

Activities completed for the IWRMP within the most recent reporting period include some significant steps that have bridged the span between planning and actual implementation of water resource protection strategies. These include production of an alternative analysis, selection of preferred alternatives and completion of a preliminary Implementation Plan. In spring 2018, the four Towns surrounding Pleasant Bay will enter into an intermunicipal agreement and a 20 year targeted watershed permit with MA DEP to address the nutrient TMDL in the shared Pleasant Bay watershed.

Also included in this effort is a website dedicated to the IWRMP which is linked to the Town's official website. Documents related to the region's water quality efforts are available on this site, as well as maps showing groundwater elevations, watershed/sub-watershed delineations feeding coastal embayments and freshwater resources, as well as results of a wide variety of water quality sampling and analysis.

The Town scheduled a training event with Kleinfelder for May 2017 for municipal employees that was attended by the following Departments: Building, Public Works, Natural Resources, Conservation, Health, Planning, Water, Recreation, Golf, Police, and Fire. This training provided an overview of the (Good Housekeeping Manual) Manual for Operations and Maintenance, and Stormwater Pollution Prevention Plan (SWPPP), recommended procedures and policies for stormwater pollution prevention, and included a brief overview of the NPDES MS4 permit and Brewster's Stormwater Programs. In this training session, Kleinfelder also conducted a hands-on Illicit Discharge Detection and Elimination (IDDE) refresher training session.

The Town is proactive in catch basin cleaning and street sweeping either using Town employees or contracted services. The Town cleans an estimated 900 basins each year and does Town wide sweeping annually with additional sweeping throughout the year if needed.

Recent awards for a coastal resiliency grant and a green infrastructure grant have increased public engagement for stormwater related issues. The coastal resiliency grant has provided opportunities to share knowledge of the impacts of climate change on water quality and infrastructure, including stormwater infrastructure. The Green Infrastructure grant, that allowed the evaluation of a managed retreat from an existing town beach parking lot (Breakwater Beach), called for pulling back the pavement, restoring the dune system and tying it into an adjacent dune system and recently restored area. This project is a good example of the pro-active efforts the Town has undertaken to meet the obligation of the NPDES program, but also the vision of the local community. The Town has also installed stormwater controls at two major coastal landings (Ellis and Linnell Landing) and one freshwater beach (Fishermans Landing). A design is entering the permitting phase for the freshwater beach at Long Pond which includes stormwater infiltration through a vegetated swale.

The Town is beginning a project to collect and store stormwater at Betty's Curve through a large vegetated swale. This project is the final connection in a watershed-wide stormwater collection system in the Stony Brook valley. When complete, it will provide storage and infiltration for stormwater from several town roads plus state highway Rte. 6A that currently enters directly into the salt marsh and the Stoney Brook herring run.

The Town is also in the final design phase of a culvert replacement on Crosby Lane. This undersized culvert ("Crosby Culvert") is being replaced to help restore tidal flow and will address stormwater runoff from the road and beach parking lot.

The Town has started working with PeopleGIS to provide stormwater management tools such as mapping infrastructure and recording structure data on inspection forms. During Permit Year 16, the Town plans to continue progress building the database in PeopleGIS.

During Permit Year 16, the Town will be completing a Gap Analysis on their Stormwater program with Environmental Partners to review the existing program and plan for future compliance with the new permit, and will be drafting the Notice of Intent that is due in September 2018.

**Part III. Summary of Minimum Control Measures**

**1. Public Education and Outreach**

<b>BMP ID #</b>	<b>BMP Description</b>	<b>Responsible Dept./Person Name</b>	<b>Measurable Goal(s)</b>	<b>Progress on Goal(s) – Permit Year 15 (Reliance on non-municipal partners indicated, if any)</b>	<b>Planned Activities</b>
Revised	Develop and distribute educational materials.	BOH Nancy Ice	Biannual Meetings	Information and educational material on stormwater management is available at Town Hall and the Town website. Public educational outreach was also accomplished while dealing with water quality issues affecting many communities, including pet waste.	Review MS4 permit and make revisions as needed. As part of the Coastal Resiliency grant, the Town of Brewster will develop educational materials. The Town of Brewster will continue to provide opportunities to citizens to learn more about ongoing projects.
Revised	Additional Education Materials	Patrick Ellis, DPW	Informational Documents	Information regarding Stormwater related public information is available through the Comprehensive Water Planning Committee website.	DPW is working with the Planning Dept. and will continue to work on educational outreach and material.
Revised	Establish Stormwater Website with pollution reporting capability	IT- Kathleen Lambert	Town website is operational with water quality links available through multiple committee and department pages.	The Town's website is a viable alternative for conveying Town related information. The Town is currently in Phase III of its Integrated Water Resources Management Plan.	Additional material will be added when it becomes available.
Revised	Brewster Conservation Day	Paul Anderson, Water Dept.	Outreach regarding water quality	Provides information on water quality.	

## 2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15 (Reliance on non-municipal partners indicated, if any)	Planned Activities
	Establish Stormwater Web Site with pollution reporting capability	IT – Kathleen Lambert	Town Web Site is operational with water quality links available through multiple committee and department pages.	<p>The Town's website is a viable alternative for conveying Town related information. Again, the IT department consists of one person and other duties and projects have taken precedence over Stormwater II efforts.</p> <p>In addition, as mentioned in the summary, the Town began the third phase of developing its Integrated Water Resources Management Plan (IWRMP) in June 2013. A component of the work by our consultant, Horsley Witten Group, is the development of a web based informational tool. The website has been developed and is accessed via a link on the Town of Brewster home webpage. Much information is available on this site and will be updated as additional information is available.</p> <p>The website can be accessed at: <a href="http://www.town.brewster.ma.us/committees-mainmenu-29/comprehensive-water-planning-committee/1185-integrated-water-management-website">http://www.town.brewster.ma.us/committees-mainmenu-29/comprehensive-water-planning-committee/1185-integrated-water-management-website</a></p>	<p>The Town of Brewster will continue to add/update Stormwater issues on its website as the Comprehensive Water Management Plan is further developed.</p> <p>Recent additions to the Website include copies of completed reports related to Phase III of the IWRMP: Schoolhouse Pond watershed assessment, the Pleasant Bay Nitrogen Management Alternatives Analysis Report, the Mill Ponds Management Plan and the Herring River Nitrogen management Assessment Technical Memo.</p> <p>Review the Final MS4 Permit and plan to make revisions to this BMP if needed.</p>
Revised					

## 2a. Additions

Lower Cape Expo	Town Planner (Ryan Bennett)	Signing up people for e-mail list, providing handouts	The CWPC has had a table at the Expo in recent years. Through two recent Expo appearances, over 40 people have joined the e-mail list, many have come to community meetings and many more took printed information. Due to costs, the Town did not attend the past two years, as originally	Members planning to participate in next year's Expo.
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	Brewster Conservation Day	Natural Resource Dept (Chris Miller)	Signing up people for e-mail list, providing handouts	<p>In the past, CWPC has a table at Conservation Day, and spent the day talking to residents and property owners about the IWRMP and things they can do, signing people up for the e-mail list, and providing printed information.</p>	<p>Although the committee no longer meets, there are a number of organizations that attend the event and educate community members on safe drinking water, eliminating use of hazardous chemicals, septic systems, run off, and pond health. Next year's Conservation Day scheduled for 7/14/18.</p>
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### 3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15 (Reliance on non-municipal partners indicated, if any)	Planned Activities
Revised	Map Stormwater facilities	Patrick Ellis, Superintendent	Update stormwater data on Town GIS system	The Town of Brewster's GIS system was upgraded and locations of untreated stormwater runoff discharges were mapped by our consultant between 2012 & 2014 to include untreated stormwater discharge locations, as well as locations of recently installed stormwater BMP's, possible system interconnections, and additional drainage structures.	Evaluate requirements of final MS4 Permit. Make revisions if needed. Continue implementation of the GIS system as appropriate.
Revised	By-law prohibiting illicit discharge	Town Planner, Ryan Bennett	Pursue passage of Illicit Discharge By-law	The by-law was passed at Town meeting in November 2011.	The Town will continue to look at ways to update by-laws and regulations to better address stormwater remediation, particularly as it regards any new requirements associated with the new Final MS4 Permit.
Revised	Illicit discharge detection	Chris Miller, Natural Resource Director	Sampling and analysis of water bodies	The Natural Resource Director and staff continue the Departments sampling and analysis program. Chris Miller has been instrumental in obtaining the Natural Resources Conservation Service funding for the aforementioned stormwater related grants.	The Town will continue its IDDE program and water sampling efforts and will likely expand reporting/publicizing results as public interest and following increases.
Revised	Illicit Discharge Detection & Elimination (IDDE) Plan	Patrick Ellis, DPW	Update IDDE Plan	The Town's 2013 IDDE Plan was updated in August 2015 by the Town's consultant. Consultant provides training to Town employees responsible for implementing IDDE Plan	Review the Final MS4 Permit and make revisions if needed. Continue to implement the Program.

### 3a. Additions

#### 4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15 (Reliance on non-municipal partners indicated, if any)	Planned Activities
Revised	Revise Development Plan Review By-law	Planning Board Town Planner, Ryan Bennett	By-law update	Development Plan Review By-law was updated in Permit Year 12 and replaced with Staff- Review By-law which improves the exchange of development information from Department heads to prospective builders, developers, and/or property owners. Water quality issues are an important component of these discussions.	Members of Staff Review Committee will continue to improve the discussions with prospective developers with regards to development requirements including stormwater quality. And developments beyond a single family home are encouraged by staff to opt for review. Review final MS4 Permit and plan to make revisions if needed.
Revised	Establish public input mechanism	Planning Board Town Planner, Ryan Bennett	In progress	Public input is a required component of any by-law change or development. The Commonwealth of Massachusetts has a well-defined open meeting law requiring public access to all deliberations, with some exceptions. As such, public input is included in the development of all by-laws and stormwater related issues achieved through public hearings required of our consultants that assist with the IWRMP.	The Town plans to continue with the IWRMP and the public informational sessions that we require of our consultants. Also, with the wealth of information available on the Town's website, getting information to the public is working well. Getting the public to respond to our water quality improvement efforts is the challenge.

#### 4a. Additions

**5. Post-Construction Stormwater Management in New Development and Redevelopment**

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15 (Reliance on non-municipal partners indicated, if any)	Planned Activities
Revised	Revise Development Plan Review By-law	Planning Board Ryan Bennett	By-law update	The Town passed a revised development review process called Staff Review, and also adopted a Site Plan Review by-law in May 2011.	Review the final MS4 Permit and plan to make revisions if needed.  The Town is looking at ways to promote the Staff Review process.
Revised	Construction Inspection	Construction inspection by proponent engineer and DPW	Continued project construction inspection	The Town does not have a formal Engineering Department and uses contract services as well as trained staff at the DPW. Also, development in the area is of a residential nature, and construction projects disturbing more than an acre are rare. The Town requires the project component's engineer to provide inspection reports and stamp reports for recordkeeping purposes.	Review the Final MS4 Permit and plan to make revisions if needed.  Continue the Town inspection program and continue to improve and update regulations with regards to water quality in all areas, including but not limited to water quality, water supply, wastewater, and stormwater runoff. Any new requirements associated with the new permit will be incorporated in accordance with the timelines provided in the permit.

**5a. Additions**

**6. Pollution Prevention and Good Housekeeping in Municipal Operations**

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15 (Reliance on non-municipal partners indicated, if any)	Planned Activities
Revised	Employee Education	Patrick Ellis, DPW	Training programs	Best Management Practices for Operations and Maintenance Training was provided to the Town of Brewster by the Town's consultant in May 2017. Manual updated in 2015. Employees present: DPW, Water, Natural Resource, Health, Police, Fire, Conservation, and Planning.	Training scheduled for 2018 to discuss Good House Keeping and IDDE in the field training.
Revised	Operations & Maintenance schedule	Patrick Ellis, DPW	Annual catch basin cleaning	Program is completed annually using contracted services. Contractor does all Town roads and Town offers service to private road for a discounted fee.	Continue the program.
Revised	Operations & Maintenance schedule	Patrick Ellis, DPW	Annual town wide sweeping	Town wide sweeping is completed using contracted services. Sweeping is also done as needed throughout the year with Town personnel and equipment.	Continue the program
Revised					
Revised					
Revised					

**6a. Additions**

7. BMPs for Meeting Total Maximum Daily Load (TMDL) Waste Load Allocations (WLA) <<if applicable>>

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15 (Reliance on non-municipal partners indicated, if any)	Planned Activities
Revised	Public Education – Pet waste	Town Planner/ Town Clerk	Reprint and Distribute Educational Materials	See BMP 1. Brochures are available at the Town Office building and are distributed at certain Town events including Brewster Conservation Day. In Permit Year 14, the Town's contractor assessed site conditions at 3 public parks which were identified as potential sources of waste for waterfowl and pets. Each location was assessed in good condition with adequate signage and waste receptacles.	Continue to distribute educational materials and develop plan to modify if needed.  Review the Final MS4 Permit and plan to make revisions if needed.
Revised	Septic Systems-tracking and education	Nancy Ice-Health Dept.	Distribute Education Materials	The locations of failing septic systems are tracked in Board of Health database. These systems will eventually be incorporated into the Town's GIS.	Re-assess existing outreach activities and educational materials and develop a plan to modify if necessary. Review and make revisions if needed.
Revised	Outfall & Runoff Inventory	DPW	GIS map all outfalls and parking area run off	All mapping complete.	See IDDE BMP. Review and make revisions if needed.
Revised	Water Quality Testing	Chris Miller, Natural Resources	Water Quality Testing	See BMP 3.	Re-assess existing sampling efforts and develop a plan to modify if necessary to monitor impaired waters.

## 7b. WLA Assessment

The MS4 Permit has requirements specific to stormwater discharges to Impaired Waters with approved TMDLs. In Brewster's case, currently these waters include Namskaket Creek and Quivett Creek, which are impaired pathogens (fecal coliform). Although there are two impaired ponds (Sheep Pond and Baker), these ponds are impaired for mercury in fish; pollution that has been attributed to air pollution and is not applicable to the NPDES MS4 program. Pleasant Bay, although impaired for nutrients, does not receive stormwater discharge from Brewster's MS4. The applicable TMDL is the Cape Cod Basin Pathogen TMDL (August 2009). The Implementation Plan for Cape Cod Pathogen TMDL states the following:

"The watershed based approach applied to complete the Cape Cod watershed pathogen TMDL is straightforward. The approach is focused on identification of sources, source reduction, and stepwise implementation of appropriate management plans. Once identified, sources are required to meet applicable WQS for indicator bacteria or be eliminated. This approach does not include water quality analysis or other approaches designed to link ambient concentrations with source loadings. For pathogens and indicator bacteria, water quality analyses are generally resource intensive and provide results with large degrees of uncertainty. Rather, this approach focuses on sources and required load reductions, proceeding efficiently toward water quality restoration activities."

Likely sources of coliform could include:

- Failing septic systems
- Illicit connections from septic systems or graywater
- Stormwater runoff from pet waste
- Wildlife (waterfowl)
- Boat pump-out discharges

## Part IV. Summary of Information Collected and Analyzed

- Number of Town staff trained: 20
- Number of MS4 outfalls: 20
- % of MS4 outfalls mapped, inspected: 100%
- Number of Illicit discharges identified: 0

**Part V. Program Outputs & Accomplishments (OPTIONAL)**

(Since beginning of permit coverage unless specified otherwise by a \*\*, which indicates response is for period covering April 1, 2017 through March 31, 2018)

**Programmatic**

	(Preferred Units)	Response
Stormwater management position created/staffed	(y/n)	N
Annual program budget/expenditures – At the Fall 2012 Special Town Meeting, funding was authorized with the specific intent of addressing the requirements of the upcoming Stormwater II change in law. This funding did not include any additional staffing. The Town continues to assess their program and did provide public comment to EPA during the public comment period for the Draft 2014 General Permit.	(\$)	
Total program expenditures since beginning of permit coverage	(\$)	
Funding mechanism(s) (General Fund, Enterprise, Utility, etc.)		General Fund/ Capital

**Education, Involvement, and Training**

Estimated number of property owners reached by education program(s)	(# or %)	4,000
Stormwater management committee established	(y/n)	N
Stream teams established or supported	(# or y/n)	N
Shoreline clean-up participation or quantity of shoreline miles cleaned **	(y/n or mi.)	Y - 8
Shoreline cleaned since beginning of permit coverage	(mi.)	8 miles annually since beginning of permit coverage
Household Hazardous Waste Collection Days		
▪ days sponsored **	(#)	Y - 6
▪ community participation **	(# or %)	214
▪ material collected **	(tons or gal)	3,341.29 gallons
School curricula implemented	(y/n)	N

## Legal/Regulatory

Regulatory Mechanism Status (indicate with "X")	In Place Prior to Phase II	Reviewing Existing Authorities	Drafted	Draft in Review	Adopted
▪ Illicit Discharge Detection & Elimination					X
▪ Erosion & Sediment Control				X	X
▪ Post-Development Stormwater Management				X	X
Accompanying Regulation Status (indicate with "X")					
▪ Illicit Discharge Detection & Elimination					X
▪ Erosion & Sediment Control				X	X
▪ Post-Development Stormwater Management				X	X

## Mapping and Illicit Discharges

	(Preferred Units)	Response
Outfall mapping complete	(%)	100%
Estimated or actual number of outfalls	(#)	20
System-Wide mapping complete (complete storm sewer infrastructure)	(%)	100%
Mapping method(s)		
▪ Paper/Mylar	(%)	
▪ CADD	(%)	0%
▪ GIS	(%)	100%
Outfalls inspected/screened **	(# or %)	100% (est.)
Outfalls inspected/screened (Since beginning of permit coverage)	(# or %)	0
Illicit discharges identified **	(#)	0
Illicit discharges identified (Since beginning of permit coverage)	(#)	0
Illicit connections removed **	(#); and (est. gpd)	0
Illicit connections removed (Since beginning of permit coverage)	(#); and (est. gpd)	0
% of population on sewer	(%)	0
% of population on septic systems	(%)	100%

### Construction

	(Preferred Units)	Response
Number of construction starts (>1-acre) **	(#)	
Estimated percentage of construction starts adequately regulated for erosion and sediment control **	(%)	
Site inspections completed **	(# or %)	
Tickets/Stop work orders issued **	(# or %)	
Fines collected **	(# and \$)	
Complaints/concerns received from public **	(#)	

### Post-Development Stormwater Management

Estimated percentage of development/redevelopment projects adequately regulated for post-construction stormwater control	(%)	
Site inspections (for proper BMP installation & operation) completed **	(# or %)	
BMP maintenance required through covenants, escrow, deed restrictions, etc.	(y/n)	
Low-impact development (LID) practices permitted and encouraged	(y/n)	

### Operations and Maintenance

Average frequency of catch basin cleaning (non-commercial/non-arterial streets) **	(times/yr)	Annual
Average frequency of catch basin cleaning (commercial/arterial or other critical streets) **	(times/yr)	Annual
Qty of structures cleaned **	(#)	900
Qty. of storm drain cleaned **	(%, LF or mi.)	900
Qty. of screenings/debris removed from storm sewer infrastructure **	(lbs. or tons)	312.93 tons
Disposal or use of screenings (landfill, POTW, compost, beneficial use, etc.) **	(location)	The Town of Brewster has a Beneficial Use Determination (BUD) for these materials, the Town hauled material Orleans Transfer Station.

Cost of screenings disposal	(\$)	15,000
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(Preferred Units)	Response
Average frequency of street sweeping (non-commercial/non-arterial streets) **	Two times per year in wetlands discharge environment. Otherwise annual town wide sweeping.
Average frequency of street sweeping (commercial/arterial or other critical streets) **	Two times per year.
Qty. of sand/debris collected by sweeping **	462.82 tons
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.) **	See above.
Cost of sweepings disposal	60,000
• Vacuum street sweepers owned/leased	1
• Vacuum street sweepers specified in contracts	N

Reduction (since beginning of permit coverage) in application on public land of: ("N/A" = never used; "100%" = elimination)	
▪ Fertilizers	(lbs. or %) Unknown
▪ Herbicides	(lbs. or %) Not used except on Golf Course
▪ Pesticides	(lbs. or %) Not used except on Golf Course
Integrated Pest Management (IPM) Practices Implemented	(y/n)

(Preferred Units)	Response
Average Ratio of Anti-/De-Icing products used **	100 % NaCl
(also identify chemicals and ratios used in specific areas, e.g., water supply protection areas)	0
	0
	0
	0
	0
	0
Pre-wetting techniques utilized **	(y/n or %) N
Manual control spreaders used **	(y/n or %) Y
Zero-velocity spreaders used **	(y/n or %) Y
Estimated net reduction or increase in typical year salt/chemical application rate	(±lbs/in mi. or %) Average
Estimated net reduction or increase in typical year sand application rate **	(±lbs/in mi. or %) N/A

% of salt/chemical pile(s) covered in storage shed(s)	%	100
Storage shed(s) in design or under construction	(y/n or #)	N
100% of salt/chemical pile(s) covered in storage shed(s) by May 2008	(y/n)	Y

**Water Supply Protection**

Storm water outfalls to public water supplies eliminated or relocated	# or y/n	N
Installed or planned treatment BMPs for public drinking water supplies and their protection areas	# or y/n	N
Treatment units induce infiltration within 500-feet of a wellhead protection area	# or y/n	N