

Municipality/Organization: Orleans, MA

EPA NPDES Permit Number: MAR041146

MaDEP Transmittal Number: W- 035744

Annual Report Number

& Reporting Period: **No. 15: May 1, 2017-April 30, 2018**

NPDES PII Small MS4 General Permit Annual Report

Part I. General Information

Contact Person: Frank Nichols

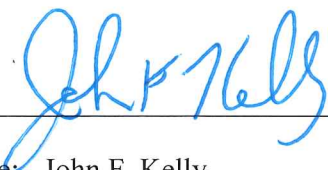
Title: Manager, Public Works

Telephone #: 508-240-3700 ext. 364

Email: fnichols@town.orleans.ma.us

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: John F. Kelly

Title: Town Administrator

Date: 5/1/18

Part II. Self-Assessment

The Town of Orleans has completed the required self-assessment and has determined that our municipality complies with all permit conditions.

Notable Accomplishments/Improvements in Permit Year 15:

Water Quality Task Force & Comprehensive Wastewater Management Plan

The Town of Orleans continues to develop significant ongoing programs to improve marine and fresh water quality and work towards the goals of the Phase II Permit and the final TMDLs for pathogens and nutrients. The draft Amended Comprehensive Wastewater Management Plan (CWMP) will be submitted in Summer 2018 for review by MassDEP and the Cape Cod Commission. The Town identified a suitable wastewater disposal site along Watts Hollow Road for the downtown Phase I sewer project and to accommodate future phases. Wastewater treatment will still occur at the former Tri-town facility, but the treated effluent will be pumped back to Watts Hollow Road for disposal. The Town continued efforts to implement demonstration projects for non-traditional methods of nitrogen removal. In March 2017, construction began to install 4,000 linear feet of sewer pipe in downtown Orleans and is anticipated to be completed by May 2018. At the May 2018 Town Meeting, a vote will be held for the funding of \$4.7 million towards the 100% design of the town's sewer collection system and the Wastewater Treatment Plant (WWTP).

In addition to the efforts to reduce nitrogen loading from septic sources, the Town of Orleans continues to implement BMPs to reduce the use of fertilizers and pesticides. The Pleasant Bay Alliance developed a fertilizer and pesticide use policy for municipal properties in April 2012. The Town developed a Fertilizer Nitrogen Control bylaw that passed at the 2014 Annual Town Meeting. The purpose of the bylaw is to restrict the use of nitrogen based fertilizers throughout Town and it includes the following provisions: no application of nitrogen between October 16 and April 14; no application before or during heavy rain; and no application within 100 feet of Resource Areas. In support of these efforts, the Orleans Pond Coalition continued a robust public education campaign in Years 14 and 15 to inform residents and businesses about the proper use of and alternatives to fertilizers. Brochures regarding proper fertilizer and pesticide use are available at the Town Hall. Orleans is one of three Massachusetts towns (Falmouth and Nantucket) to have such a bylaw.

In Year 11, a Cedar Pond Management Plan was produced by the UMASS – Dartmouth School of Marine Science and Technology (SMAST) and the Water Quality Task Force and was unanimously approved by the Board of Selectmen. Following the recommendations of SMAST for the Cedar Pond Management Plan, the water control flash boards in the old weir were replaced in Fall of 2017 to hold back the pond and limit salt water intrusion. The Town continued working with Eversource to relocate the overhead electric wires that cross Cedar Pond where hundreds of cormorants congregate.

The Town created the Orleans Freshwater Ponds Work Group that met 8 times during Permit Year 15. The Work Group was tasked

with identifying priority projects for remediation and/or protection of freshwater ponds in Orleans. The responsibilities of the Work Group have been transferred to the Orleans Marine and Freshwater Group, but the initiative resulted in the identification of remediation options for Uncle Harvey Pond, which remain under consideration for implementation. The DPW approved a 75% design for deep sump catch basins, a sediment tank for pretreatment, and a recharge system in the road to improve stormwater management near Uncle Harvey Pond. Construction is pending the availability of funding.

The Town completed a study in early 2016 for Town Cove at the Nauset Harbor inlet to evaluate dredging to increase tidal flushing for the Nauset Estuary. The project was determined to be feasible, but permitting will take multiple years. As part of this process, the Town continues to investigate dredge spoil disposal sites, which includes potential dune restoration at Nauset beach.

Orleans Water Quality Advisory Panel

In Year 15, the Orleans Water Quality Advisory Panel (OWQAP) continued to guide studies and assessments, define preferred approaches, seek consensus, and build widespread community support for a customized, affordable water quality management plan for the Town of Orleans. The panel consists of stakeholder representatives (Orleans Selectmen and representatives of engaged citizen constituencies), and liaisons from key town boards and commissions, organizations, neighboring towns, and regional, state, and federal partners. It is staffed and assisted by AECOM. The OWQAP has met monthly during the last year and all meetings were open to the public. The OWQAP continued to evaluate various aspects of the Amended Comprehensive Wastewater Management Plan and associated Adaptive Management Plan.

Tri-Town Septage Facility

The Tri-town septage facility previously served Orleans and two other towns, Brewster and Eastham, and lower Cape for septic waste disposal by providing essential nitrate removal. The agreement between the three towns to use the facility expired on May 30, 2015. Following discussions between the three towns, a decision was made to close the plant as of June 1, 2016 and the facility will be removed, followed by site restoration. The demolition of the facility will be completed by May 2018. Septic waste is handled by hauling from individual properties to an approved out of town facility. At the May 2018 Town Meeting, a vote will be held for the funding of \$4.7 million towards the 100% design of the town's sewer collection system and the new Wastewater Treatment Plant (WWTP) at the former Tri-Town Septage Facility.

Pleasant Bay Resource Management Plan Update

The Pleasant Bay Resource Management Plan was updated in 2013 and the updated plan was adopted in May 2013. The plan will further the Town's ongoing effort to work collaboratively with neighboring Towns to promote the natural resource health and public enjoyment of Pleasant Bay. The plan was updated in Year 15 and will be presented at the May 2018 Town Meeting for approval.

Stormwater Management Planning

The Town and its consultant continued to evaluate program needs based on the 2016 Phase II Permit. The Town anticipates using this

information and the results from other activities (e.g., CWMP, BMP projects) to develop an appropriate strategy to address the requirements related to TMDLs and impaired water bodies, as part of the Stormwater Management Plan (SWMP) development under the final permit. The Town continued to work towards development of a comprehensive SWMP to meet future regulatory requirements and water quality goals. The following key stormwater management planning activities occurred in Year 15:

- GHD Engineers completed an inventory of 68 existing stormwater BMPs in Town and assessed the condition to develop recommendations for maintenance and rehabilitation. The inventory was completed in July 2016 and updated from April to June 2017 to incorporate additional BMPs identified through mapping of the downtown area by SMC Engineering, Inc.
- The results of the above efforts were incorporated into a stormwater pollutant load analysis and dynamic planning tool by Amec Foster Wheeler and provide the following information: baseline stormwater pollutant loads; analysis of existing stormwater BMPs and benefits; delineation of every outfall catchment; and recommendations for stormwater management priorities. This work is ongoing and work continued to develop to complete an evaluation of proposed projects, benefits and costs that will help the Town prioritize future projects for BMP rehabilitation, retrofits, and potentially new BMPs. This effort is anticipated to be completed by the summer of 2018.
- The above efforts were reviewed on an ongoing basis by the Stormwater Team, which consists of the DPW and Natural Resources Director, DPW Manager, Town Planner, Health Agent, Conservation Officer and the Chairperson of the Marine and Freshwater Quality Task Force.

Public Education & Involvement Activities

The Town of Orleans conducted the following major events to promote awareness of water resources and engage the community:

- Celebrate Our Waters Event: The Orleans Pond Coalition hosted a “Celebrate Our Waters” event on September 15th, 16th, and 17th in 2017. The celebration was well attended with approximately 3,000 people and it included events in Eastham and in Brewster to highlight “shared waters”.
- Arbor Day Celebration: the Orleans Tree Department and Orleans Improvement Association teamed with Ameri-Corp Cape Cod to honor Arbor Day by conducting the following projects:
 - Bolands Pond: as discussed in the Year 12 report, efforts began to restore the Bolands Pond area, which consists of a 4.7-acre kettle pond and 9 acres of upland forest that includes both native and invasive vegetation. The activities included installation of an outdoor classroom and trail system to aid in the removal of invasive plant species. The Nauset Regional Middle School and Orleans Elementary School students assisted with the cleanup and restoration of the forest and participated in the outdoor classroom program. The property was maintained during Year 15.
 - Uncle Harvey Pond: the Town partnered with a private land owner to remove invasive species (phragmites). The second year of a 3-year program was completed in Year 15.
 - Eldridge Playground: Ameri-Corp planted nine trees and other shrubs. The Orleans Improvement Association donated money for improvements that included irrigation and drainage work to infiltrate stormwater from the tennis courts. Additional private donations were used to fund the improvements. These improvements were maintained in year 15.

Barnstable County Coastal Resources Committee

Orleans has a standing member on the Barnstable County Coastal Resources Committee (BCCRC), which meets quarterly. This committee serves as a contact between towns and the County on coastal issues. The committee is the local governance committee for the Cape Cod region of the Massachusetts Bays Program.

Stormwater BMP Assessment, Design, & Construction

There were several stormwater and water quality improvement projects designed and constructed in Year 15:

- GHD Engineers completed an inventory of 68 existing stormwater BMPs in Town and assessed the condition to develop recommendations for maintenance and rehabilitation. The inventory was completed in July 2016 and updated from April to June 2017 to incorporate additional BMPs identified through mapping of the downtown area.
- Water Quality Monitoring – ongoing water quality monitoring was conducted throughout Year 15 at the creeks that enter Cape Cod Bay, Pleasant Bay, and Nauset Bay (23 locations).
- Drainage Improvement / Flooding Mitigation Projects:
 - Rock Harbor Road – stormwater infiltration for direct outfalls was installed in the Fall of 2017 to eliminate flooding.
 - Quanset Road – a recharge system was extended in the Fall of 2017 to reduce flooding.
 - Barley Neck – a National Resources Conservation Service (NRCS) grant was received to start design in the summer of 2018 to increase the capacity of an existing infiltration system (43-BMP-1) to treat 1” of rainfall.
 - Granny’s Lane and Sea Mist Drive – designs to reduce flooding were completed and are planned to be constructed in summer of 2018.
 - Nickerson Road – a new deep sump catch basin was installed and the recharge system was extended in the fall of 2017 to reduce flooding.
 - Seavers Road – a new deep sump catch basin and recharge system was installed in the fall of 2017 to reduce flooding.
 - Rayber and Giddiah Hill Road: solutions for flooding and drainage problems will be designed in the summer of 2018.

As discussed above, the Town continued to develop a comprehensive planning tool to evaluate priority areas for capital projects to design and install stormwater BMPs for water quality improvements.

Stormwater Team

In Permit Year 11, the Town of Orleans established a stormwater committee called the “Stormwater Team.” The Stormwater Team was developed to provide broader insight to evaluate stormwater projects and for the planning and prioritization of stormwater improvements. Members include the DPW Director, DPW Manager, Town Planner, Health Agent, Conservation Officer and the Chairperson of the Marine and Freshwater Quality Task Force. Various members of the Stormwater Team participated in specific planning and implementation related to water quality improvement throughout Year 15.

Part III. Summary of Minimum Control Measures

1. Public Education and Outreach

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
A.1	Develop and Broadcast Via PA CATV Storm Water Video	Frank Nichols, Public Works Manager	One per year – in conjunction with County Group	The video “After the Storm” is available through an internet media player on the DPW web page.	Broadcast other pertinent videos on local cable or other media outlets.
Revised			# website hits/views for video	The DPW Director presents to the Board of Selectmen on a quarterly basis and provides an update on stormwater management activities. These meetings are broadcast on the local cable network.	
A.2	Household Hazardous Waste (HHW) Control	Frank Nichols, Public Works Manager	Annual HHW Collection	Collection days were held in Eastham and Orleans on May 6 th and September 16 th , 2017. Vehicle drop offs totaled to 291 for both days, with 136 from Orleans. The household hazardous waste collected consisted of 17,975 gallons of paint, 935 gallons of pesticides, and 935 gallons of gas and flammable liquids.	Continue reciprocal HHW collections with the Town of Eastham. Continue tracking resident participation and results.
Revised			# residents participating	Event organizers tracked the effectiveness of the various advertisement methods and Orleans participants heard of the events through a brochure, newspaper, signs, radio/tv, and other means. The Orleans Transfer station offers annual paint collections and offers collection of waste gasoline, waste oil and waste antifreeze free to Transfer Station ticket holders. In 2017, the Transfer Station collected and disposed of 950 gallons of waste oil, 420 gallons of waste gasoline and 250 gallons of waste antifreeze.	HHW Collections are planned for May 19 th , 2018 in Eastham and September 22 nd , 2018 in Orleans

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
A.3	Education Flyers	Frank Nichols, Public Works Manager	Distribute 2 per year at Transfer Station	Flyers were replaced with numerous other educational events that were held this permit year. An educational sign was developed for Priscilla Landing and was posted in May 2016 and reinstalled in 2017.	Consider distributing educational flyers and/or other materials and track materials taken. Continue to consider alternative methods to provide public education and outreach addressing HHW collection and stormwater management concepts.
Revised			# flyers taken by residents	See also “Notable Accomplishments” section.	

1a. Additions

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
A.4	Web Page Information	Frank Nichols, Public Works Manager & Peter VanDyck, IT Coordinator	Short Article – one per year	As discussed under BMP A.1, the video “After the Storm” is linked through the Highway Department’s webpage. The webpage also links to EPA’s NPDES Stormwater Program web page and the Town’s stormwater bylaws.	Continue to maintain existing web pages related to stormwater and water quality. Evaluate additional web page links and begin tracking the number of hits. Consider short articles or topics that can be posted annually on web pages.
Revised			# website hits	Agendas, meeting minutes, and additional information are posted on a webpage for the Marine and Fresh Water Quality Task Force. The Town also maintains a webpage for reports, meeting minutes and other documents related to the CWMP. The Orleans Pond Coalition maintained and updated its website to continue to promote general awareness of water bodies in Orleans. The website integrates the Town’s efforts to protect and improve water quality through the implementation of the CWMP, fertilizer management programs and “Mutt Mitts” program for dog waste.	Evaluate methods to integrate stormwater program information and educational opportunities between the Town web pages and the website maintained by the Orleans Pond Coalition

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
A.5	Other Public Education In Year 15	Frank Nichols, Public Works Manager		Copies of “The Orleans Blue Pages” water quality protection booklet (50+ pages) developed by the Orleans Pond Coalition were made available at no cost for residents at Town Hall. Copies are also available for free download from the Orleans Pond Coalition website.	Continue existing public awareness activities and evaluate methods to track materials taken, posters, displays and audience (number) reached.
Revised	Other Public Education Activities in Year 15		# copies of “Orleans Blue Pages” taken by residents # posters displayed & handouts		
A.6	Storm Drain Stenciling	Frank Nichols, Public Works Manager	Stencil storm drains leading to critical priority outfalls.	No storm drain stenciling occurred during the permit term.	Continue storm drain stenciling activities at highly visible areas and areas that drain directly to priority outfalls and waterways.
Revised		Marine & Fresh Water Quality Task Force	# stenciled drains per year		

2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
B.1	Water Quality Monitoring Program	Marine & Fresh Water Quality Task Force	Ongoing	In Permit Year 15, the Marine & Fresh Water Quality Task Force performed water quality monitoring activities. Summer sampling of embayments continued and included 23 locations on Cape Cod Bay, Nauset Estuary, and Orleans' portion of Pleasant Bay. 75 volunteers collected approximately 500 samples on five sampling days.	Evaluate priorities and continue monitoring water quality and tracking which program results were most effective. Use monitoring results to develop remediation plans for high priority areas. Continue to support Task Force and hold monthly meetings.
Revised		Town Administrator & Board of Selectmen	# samples collected, water bodies assessed each year & water quality improvements	<p>The Marine & Fresh Water Quality Task Force met once per month to review monitoring activities and results related to priority water bodies and potential improvement projects. The following areas are considered high priority areas in town: Cedar Pond, Meetinghouse Pond, Meetinghouse River, Town Cove, Bolands Pond, Ellis Pond, and inland ponds and estuaries.</p> <p>The Town created the Orleans Freshwater Ponds Work Group that met 8 times during Permit Year 15. The Work Group was tasked with identifying priority projects for remediation and/or protection of freshwater ponds in Orleans.</p>	

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
B.2	Estuaries Program	Director of Planning and Development	Ongoing	The draft Amended Comprehensive Wastewater Management Plan (CWMP) will be submitted in Summer 2018 for review by MassDEP and the Cape Cod Commission.	Continue to promote the CWMP and implement recommendations and strategies. Continue to incorporate elements of the CWMP into the SWMP to meet the new permit requirements, as appropriate.
Revised	Estuaries Program & Comprehensive Wastewater Management Plan (CWMP)		Regulatory review of CWMP. Assessment of potential cost-saving alternatives.	<p>The Town identified a suitable wastewater disposal site along Watts Hollow Road for the downtown Phase I sewer project and to accommodate future phases. Wastewater treatment will still occur at the former Tri-town facility, but the treated effluent will be pumped back to Watts Hollow Road for disposal.</p> <p>In March 2017, construction began to install 4,000 linear feet of sewer pipe in downtown Orleans and is anticipated to be completed by May 2018. At the May 2018 Town Meeting, a vote will be held for the funding of \$4.7 million towards the 100% design of the town's sewer collection system and the Wastewater Treatment Plant (WWTP) at the former Tri-Town Septage Facility.</p>	

2a. Additions

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
B.3	Storm Drain Stenciling	Frank Nichols, Public Works Manager	Stencil storm drains in downtown area and other at systems leading to critical priority outfalls.	Refer to BMP A.6.	Refer to BMP A.6.
Revised		Volunteers	# stenciled drains per year & # volunteers		

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
B.4	Outfall Monitoring	Frank Nichols, Public Works Manager	Perform dry weather outfall monitoring of all outfalls that were initially observed to have flow during the GIS locating.	Highway Department staff continue to receive training on data collection and illicit discharge detection during catch basin cleaning activities. Greenseal Environmental noted dry weather flow during mapping efforts in Year 12 and documented the locations. The Town conducted additional mapping efforts in Year 15 and the town-wide map is complete. The Town plans to review dry weather flows at storm drain outfalls in accordance with the 2016 MS4 permit.	Incorporate inspection results into the prioritization scheme for future improvement projects. Continue to support the efforts of the Marine & Fresh Water Quality Task Force and coordinate efforts with the Orleans Pond Coalition volunteers.
Revised	Volunteer Outfall Monitoring Program	Marine & Fresh Water Quality Task Force	# volunteer participants		
B.5	Maintain Animal Waste Collection Bags in Key Areas of Concern	Orleans Pond Coalition		“Mutt Mitts” animal waste collection bags were maintained by 21 volunteers from the Orleans Pond Coalition at key areas of concern for residents to properly dispose of waste. Town Departments assisted with proper waste disposal. Approximately 45,000 bags were used across 53 stations.	Continue maintenance of “Mutt Mitts” program and ensure proper disposal of wastes. Continue to track the number of bags taken and evaluate if high occurrences of improper disposal warrant a targeted education campaign.
Revised		Frank Nichols, Public Works Manager			
B.6	Water Day Celebration	Orleans Pond Coalition	List of activities & participants	The Orleans Pond Coalition hosted a “Celebrate Our Waters” event on September 15 th , 16 th , and 17 th , 2017. The event was well attended with approximately 3,000 people. The celebration included events in Eastham and Brewster.	Organize another “Celebrate Our Waters” event with the Orleans Pond Coalition. Incorporate stormwater education topics and activities into the event. The 2018 Celebrate Our Waters event is planned for September 22 nd and 23 rd
Revised					
B.7	Operation Orleans	Orleans Tree Dept. & Conservation Trust	List of activities & participants	The Orleans Tree Department teamed with Ameri-Corp Cape Cod to honor Arbor Day by continuing the Bolands Pond Project. Invasive species were removed at Uncle Harvey Pond as the second step in a 3-phase project. Drainage and irrigation improvements were completed at Eldridge Park. Refer to “Notable Accomplishments” for further descriptions of the events.	Continue to maintain the Bolands Pond project and evaluate other projects/opportunities for Orleans Green Week.
Revised	Orleans Green Week				

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
B.8	Shoreline Cleanup	Orleans Pond Coalition	Areas cleaned, waste collected & participants	A volunteer cleanup is held every May at Nauset Beach. The cleanup occurs along 9 miles of shoreline and the 2017 event resulted in approximately 25 cubic yards of waste collected.	Continue the volunteer cleanup at Nauset Beach.
Revised					

3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
C.1	Storm Water System Mapping and Database Development	Frank Nichols, Public Works Manager	Comprehensive town-wide survey by year 2 – as funding allows	Greenseal Environmental noted dry weather flow during mapping efforts in Year 12 and documented the locations. The Town conducted additional mapping efforts in Year 15 and the town-wide map is complete. The Town plans to review dry weather flows at storm drain outfalls in accordance with the 2016 MS4 permit. GHD Engineers completed a town-wide inventory of existing BMPs in July 2016 and updated the inventory from April to June 2017 to incorporate additional BMPs identified through mapping of the downtown area by SMC Engineering, Inc. The inventory evaluated 68 BMPs and the results of this work were incorporated into the Town's GIS database.	Continue to update the drainage system base map as needed.
Revised					
C.2	Review Existing By-Laws	Director of Planning and Development	Review existing by-laws and adopt storm water ordinance FY06	As discussed in previous reports, a Floor Drain Regulation went into effect on July 1, 2010. The Illicit Discharge Bylaw was adopted at the May 2013 Town Meeting. The Bylaw addresses all illicit discharges to the MS4 and water bodies in Orleans.	Monitor and enforce the Illicit Discharge Bylaw and local requirements related to floor drains, dumping, and pet waste control.
Revised					

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
C.3	Identify and Document Illicit Connections	Frank Nichols, Public Works Manager	Review C.1 results, finalize database by Year 4	The Highway Department inspects all catch basins during cleaning operations and completes a form to document the condition and any potential illicit discharges.	Continue to inspect outfalls with previous dry weather flows to verify that an illicit discharge is not present.
Revised	Identify & Remove Illicit Connections & Discharges		# discharges identified, removed within 1 year of discovery	<p>Greenseal Environmental noted dry weather flow during mapping efforts in Year 12 and documented the locations. The Town conducted additional mapping efforts in Year 15 and the town-wide map is complete.</p> <p>The Town plans to review dry weather flows at storm drain outfalls in accordance with the 2016 MS4 permit.</p> <p>One potential illicit discharge was identified near Giddiah Hill Road and Finlay Road where stormwater was pumped from private property to the storm drain system. This issue will be addressed in May 2018.</p>	Continue to review mapping results with catch basin, pipe cleaning and inspection information. Incorporate existing procedures into future IDDE procedures and the O&M Plan under Control Measure 6.

3a. Additions

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
C.4	Comprehensive Wastewater Management Plan	Director of Planning and Development	Progress towards a final CWMP	In Year 15, the Orleans Water Quality Advisory Panel (OWQAP) met monthly and continued to guide studies and assessments, define preferred approaches, seek consensus and build widespread community support for a customized, affordable water quality management plan for the Town of Orleans. Additional information is discussed under “Notable Accomplishments”.	Continue to monitor how elements from the CWMP or other Plans and the SWMP overlap to identify any practices that could satisfy requirements of both.
Revised					

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
C.5	Public Education for Illicit Discharges	Frank Nichols, Public Works Manager		As outlined in BMPs A.1 through A.6 and B.5, various entities have incorporated information regarding illicit discharges into existing public education and public involvement activities.	Continue to incorporate illicit discharge information into existing public education and involvement activities and evaluate results.
Revised					

4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
D.1	Review Existing By-Laws	Director of Planning and Development	Review existing by-laws and adopt construction ordinance	The Town previously adopted the Drainage, Erosion, and Sediment control bylaw at Town meeting in May 2008.	Continue to enforce bylaws and document actions.
Revised				The Highway Department continued to inspect sites throughout the Town for potential erosion issues. Two issues were remedied in Year 15 near Priscilla Lane and Monument Road.	
D.2	Propose amendments and articles at Town Meeting	Director of Planning and Development	Spring 06	As discussed in previous reports, the Town adopted the Drainage, Erosion, and Sediment control bylaw at Town meeting in May 2008.	Continue to evaluate effectiveness of bylaws and amend if necessary.
Revised			Ongoing	No amendments were deemed necessary at this time.	

4a. Additions

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
D.3	Establish a Procedure for Receipt of Information by Public	Frank Nichols, Public Works Manager	# calls received & record of corrective actions	No calls were received this year.	Continue to respond to calls regarding construction site erosion and sediment issues.
Revised					

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	Planned Activities – Next Permit Term
E.1	Review Existing By-Laws	George Meservey, Director of Planning and Development	Review existing by-laws and adopt Runoff Control Ordinance	The Town previously adopted the Drainage, Erosion, and Sediment control bylaw at Town meeting in May 2008. Any plans for significant development are reviewed for compliance through the Site Plan Review committee.	Continue to enforce bylaw and review plans through Site Plan Review committee.
Revised					
E.2	Propose amendments and articles at Town Meeting	George Meservey, Director of Planning and Development		Refer to BMP E.1. No amendments were deemed necessary at this time.	Continue to evaluate effectiveness of bylaws and amend if necessary.
Revised			Ongoing		

5a. Additions (none at this time)

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	Planned Activities – Next Permit Term
F.1	Street Sweeping	Frank Nichols, Public Works Manager	Sweep as part of annual winter cleanup and as needed	There are 54 miles of street in the Town and all streets were swept at least twice during the permit year. Additional streets are swept 2-3 times during the year including known areas of high sediment/sand accumulation, downtown areas, and paved areas that discharge to environmentally sensitive areas. In 2013, the Town purchased a new generative air sweeper to improve street sweeping operations and water quality. Approximately 464 tons of street sweepings were collected during the year and reused in accordance with the existing BUD. The Town modified the landfill Site Assignment Permit to use street sweepings and catch basin cleanings to build an area for compost operations.	Continue annual street sweeping program and focus additional sweeping efforts on needed and environmentally sensitive areas.
Revised					

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
F.2	Catch Basin Cleaning	Frank Nichols, Public Works Manager	Clean all basins in town on yearly rotating schedule	Approximately 625 basins were cleaned and all 1,539 were inspected. Approximately 76.2 tons of catch basin cleanings were collected during the year. In addition, all existing stormwater BMPs were inspected and if necessary cleaned of sediment.	Continue annual catch basin cleaning Program. Consider evaluating drainage areas to prioritize cleaning efforts as appropriate.
Revised				Approximately 75 feet of storm drain pipes were cleaned. None of these were camera inspected since many were culverts that could be visually inspected. Materials were reused in accordance with the existing BUD.	
F.3	Develop Drainage System Improvement Plan	Frank Nichols, Public Works Manager	Prepare Capital Plan Article for FY10	The Ongoing Capital Plan includes an allotment of \$173,939 for water quality related drainage improvements. A construction plan for water quality improvements projects is updated annually based on the results and input from the Marine and Fresh Water Quality Task Force.	Continue funding the drainage system components of the Capital Plan to remediate outfalls and construct stormwater BMPs.
Revised			Update Capital Plan Annually	See “Notable Accomplishments” for a more detailed description of activities and projects related to this BMP.	
F.4	Propose Amendments and Articles at Town Meeting	Frank Nichols, Public Works Manager	Spring 06	Consistent with the efforts under BMP F.3, The Town appropriated \$173,939 for the design and construction of stormwater BMPs throughout the year. This funding is now available for stormwater planning efforts to evaluate the most appropriate locations for stormwater remediation projects. The Town focused on evaluating priority stormwater remediation projects. See “Notable Accomplishments” for a more detailed description of activities and projects related to this BMP.	Continue to fund water quality improvement planning and construction projects annually.
Revised			Prepare Capital Plan Articles Annually		

6a. Additions

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
F.5 Revised	Maintain Animal Waste Collection Bags in Key Areas of Concern	Orleans Pond Coalition		“Mutt Mitts” animal waste collection bags were maintained by 21 volunteers from the Orleans Pond Coalition at key areas of concern for residents to properly dispose of waste. Town Departments assisted with proper waste disposal. Approximately 45,000 bags were used across 53 stations.	Continue maintenance of “Mutt Mitts” program and ensure proper disposal of wastes. Continue to track the number of bags taken and evaluate if high occurrences of improper disposal warrant a targeted education campaign.
F.6 Revised	Nutrient Loading Reductions	Frank Nichols Public Works Manager	Implement Organic Based Land Management Program	<p>As discussed under “Notable Accomplishments”, the Pleasant Bay Alliance developed a fertilizer and pesticide use policy for municipal properties in April 2012. The Town developed a Fertilizer Nitrogen Control bylaw that passed at the 2014 Annual Town Meeting.</p> <p>The Organic Based Land Management Program continued for Town properties, consistent with NOFA guidelines. The program focuses on reducing nutrient loads with cultural land management practices and organic enhancements for healthy turf and native vegetation. Compost from the Transfer Station was used for turf enhancement. The Town also only uses organic fertilizer. The organic fertilizer is made from compost teas and comes in kits that contain organic components rich in microorganisms highly beneficial to plant growth and health. The fertilizer is planned to be applied in spring, summer and fall depending on staffing availability.</p> <p>Modified mowing practices continued at the Town Cove conservation viewing areas to reduce the need for rigorous turf management. The Town has used limited organic-based pesticides for the last 10 years.</p>	<p>Continue organic based land management program to minimize nutrient loading. Evaluate methods to estimate the quantity of nutrients reduced through this program.</p> <p>Continue turf and pesticide management practices at Town Cove and other locations to reduce the need for chemical applications.</p> <p>Continue implementation of the fertilizer and pesticide use policy for municipal properties.</p>

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
F.7	Trash Management	Frank Nichols, Public Works Manager & Nathan Sears, Harbormaster and Natural Resources Manager	Maintain a proactive trash collection program	Town Departments maintained the active Trash collection program at appropriate town properties with waste receptacles. A dumpster is also maintained by the Harbor Master for fishing fleet waste at the Town harbor. This dumpster was put out during the fishing season to encourage proper waste disposal. The program provides a means of waste disposal at public areas to discourage littering.	Continue to service litter sanitary waste receptacles at appropriate locations around the Town.
Revised	Trash and Waste Management			The Town provides and maintains portable toilets at Rock Harbor, Skaket Beach and Town recreation facilities.	
F.8	Inventory of BMP Locations & Needs	Frank Nichols, Highway Manager	Ongoing inventory of BMP locations and needs to address water quality issues	The locations of stormwater BMPs are maintained to develop projects for water quality improvement. This BMP supports BMPs F.3 and F.4. As discussed under “Notable Accomplishments”, the Town’s consultants completed mapping efforts and the analysis of stormwater pollutant loads to develop a better understanding of priority stormwater management and improvement areas. This will serve as the basis for future BMP projects and allow the Town to update its database for stormwater improvements.	Prioritize future BMP projects for funding.
Revised				GHD Engineers completed an inventory of 68 existing stormwater BMPs in Town and assessed the condition to develop recommendations for maintenance and rehabilitation. The inventory was completed in July 2016 and updated from April to June 2017 to incorporate additional BMPs. Planned and ongoing BMP projects are discussed under “Notable Accomplishments”.	Continue to maintain and update the BMP inventory and develop projects with the Marine & Fresh Water Quality Task Force.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 15	Planned Activities – Next Permit Term
F.9	Stormwater Training for Highway Staff	Frank Nichols, Highway Manager	Annual training on various topics, record of training attendance & materials	Highway Department staff are trained annually for the inspection and maintenance of the drainage system, including how to identify potential illicit discharges. Additional training is planned for 2018 once the new MS4 permit is effective.	Continue to train staff annually and maintain copies of curriculum and attendance sheets. Review the stormwater training for Highway staff and update curriculum.
Revised					
F.10	Municipal Facilities Evaluation	Frank Nichols, Highway Manager	Inventory of municipal facilities & report	In Year 10, the Town evaluated municipal facilities for pollution prevention and good housekeeping practices to determine if any improvements are needed. The Town continued to implement the recommendations in Year 15. The Town worked on the following activities in Year 15: -Continued construction of a new Police Department facility. -The Town plans to reconstruct the stone lined swale at the landfill in 2018 to prevent groundwater infiltration through the old drying beds. -The new DPW facility, including a wash bay with under-wash, received funding and is currently under construction. The facility is anticipated to be complete by October 2018.	Implement recommendations based on the availability of funding.

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	Planned Activities – Next Permit Term
Revised					

7a. Additions (none at this time)

7b. WLA Assessment

As discussed in this annual report, the Town of Orleans continues to develop significant ongoing programs that improve marine and fresh water quality and meet compliance responsibilities with the 2016 Phase II Permit and the pathogen and nutrient TMDLs. The efforts of the Marine and Fresh Water Quality Task Force, Orleans Pond Coalition, past and planned BMP construction projects and the efforts of the Orleans Water Quality Advisory Panel (OWQAP) have or will result in significant water quality and habitat improvements.

The draft Amended Comprehensive Wastewater Management Plan (CWMP) will be submitted in Summer 2018 for review by MassDEP and the Cape Cod Commission. The Town identified a suitable wastewater disposal site along Watts Hollow Road for the downtown Phase I sewer project and to accommodate future phases. Wastewater treatment will still occur at the former Tri-town facility, but the treated effluent will be pumped back to Watts Hollow Road for disposal. Continued efforts to implement demonstration projects for non-traditional methods of nitrogen removal. In March 2017, construction began to install 4,000 linear feet of sewer pipe in downtown Orleans and is anticipated to be completed by May 2018. At the May 2018 Town Meeting, a vote will be held for the funding of \$4.7 million towards the 100% design of the town's sewer collection system and the Wastewater Treatment Plant (WWTP) at the former Tri-Town Septage Facility.

The OWQAP has met monthly during the last year and all meetings were open to the public. The OWQAP continued to evaluate various aspects of the Amended Comprehensive Wastewater Management Plan and associated Adaptive Management Plan.

The Town and its consultant evaluated program needs based on the 2016 Phase II Permit. The Town anticipates using this information and the results from other activities (e.g., CWMP, BMP projects) to develop an appropriate strategy to address the requirements related to TMDLs and impaired water bodies, as part of the Stormwater Management Plan (SWMP).

Part IV. Summary of Information Collected and Analyzed

As discussed previously, numerous activities were conducted in Year 15 through several programs to improve marine and fresh water quality and work towards the goals of the Phase II Permit and the final TMDLs for pathogens and nutrients.

Part V. Program Outputs & Accomplishments (OPTIONAL)

Programmatic

Stormwater management position created/staffed	(y/n)	N
Annual program budget/expenditures	(\$)	\$173,939

Education, Involvement, and Training

Estimated number of residents reached by education program(s)	(# or %)	100%
Stormwater management committee established	(y/n)	Y
Stream teams established or supported	(# or y/n)	N
Shoreline clean-up participation or quantity of shoreline miles cleaned	(y/n or mi.)	9 mi (Nauset Beach)
Household Hazardous Waste Collection Days		
▪ days sponsored	(#)	2
▪ community participation	(%)	201 vehicles
▪ material collected	(tons or gal)	19,845 gallons
School curricula implemented	(y/n)	
Note: The Town also collected waste oil, gasoline and antifreeze at the Transfer Station that resulted in a total of 1,620 gallons.		

Legal/Regulatory

	In place prior to Phase II	Under Review	Drafted	Adopted
Regulatory Mechanism Status (indicate with "X")				
▪ Illicit Discharge Detection & Elimination				X
▪ Erosion & Sediment Control				X
▪ Post-Development Stormwater Management				X
Accompanying Regulation Status (indicate with "X")				
▪ Illicit Discharge Detection & Elimination				X
▪ Erosion & Sediment Control				X
▪ Post-Development Stormwater Management				X

Mapping and Illicit Discharges

Outfall mapping complete	(%)	100%
Estimated or actual number of outfalls	(#)	136
System-Wide mapping complete	(%)	100%
Mapping method(s)		
▪ Paper/Mylar	(%)	
▪ CADD	(%)	
▪ GIS	(%)	100%
Outfalls inspected/screened	(# or %)	100%
Illicit discharges identified	(#)	1*
Illicit connections removed	(#) (est. gpd)	0
% of population on sewer	(%)	0%
% of population on septic systems	(%)	100%

*Planned removal by May 2018

Construction

Number of construction starts (>1-acre)	(#)	2
Estimated percentage of construction starts adequately regulated for erosion and sediment control	(%)	100%
Site inspections completed	(# or %)	Several
Tickets/Stop work orders issued	(# or %)	0
Fines collected	(# and \$)	0
Complaints/concerns received from public	(#)	0

Post-Development Stormwater Management

Estimated percentage of development/redevelopment projects adequately regulated for post-construction stormwater control	(%)	100%
Site inspections completed	(# or %)	0
Estimated volume of stormwater recharged	(gpy)	NA

Operations and Maintenance

Average frequency of catch basin cleaning (non-commercial/non-arterial streets)	(times/yr)	1/yr
Average frequency of catch basin cleaning (commercial/arterial or other critical streets)	(times/yr)	1-2/yr
Total number of structures cleaned /inspected	(#)	625 cleaned 1,539 inspected
Storm drain cleaned	(LF or mi.)	75 LF
Qty. of screenings/debris removed from storm sewer infrastructure	(lbs. or tons)	76.2 Tons
Disposal or use of sweepings (landfill, POTW, compost, recycle for sand, beneficial use, etc.)		BUD
Cost of screenings disposal	(\$)	\$0

Operations and Maintenance (con't.)

Average frequency of street sweeping (non-commercial/non-arterial streets)	(times/yr)	2/yr
Average frequency of street sweeping (commercial/arterial or other critical streets)	(times/yr)	2-3/yr
Qty. of sand/debris collected by sweeping	(lbs. or tons)	464 Tons
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.)	(location)	BUD
Cost of sweepings disposal	(\$)	~\$0
Vacuum street sweepers purchased/leased	(#)	0
Vacuum street sweepers specified in contracts	(y/n)	N

Reduction in application on public land of: (“N/A” = never used; “100%” = elimination)		
▪ Fertilizers	(lbs. or %)	100%
▪ Herbicides	(lbs. or %)	100%
▪ Pesticides	(lbs. or %)	100%

Anti-/De-Icing products and ratios	% NaCl % Sand/Salt	100% of the time None*
Pre-wetting techniques utilized	(y/n)	N (pre-treated salt)
Manual control spreaders used	(y/n)	Y
Automatic or Zero-velocity spreaders used	(y/n)	Y**
Estimated net reduction in typical year salt application	(lbs. or %)	33% (since beginning of permit)
Salt pile(s) covered in storage shed(s)	(y/n)	Y
Storage shed(s) in design or under construction	(y/n)	Y***
*Sand is occasionally used (~60 tons) for traction on some roads when temperatures are extremely low.		
**4 of 5 spreaders now have ground speed controllers.		
***Recently constructed and ready for 2018-2019 snow season.		