City of Wilmington, North Carolina

STORMWATER MANAGEMENT PLAN & ANNUAL NPDES PERMIT REPORT

Prepared by:
City of Wilmington, NC
Stormwater Services
PO Box 1810
209 Coleman Drive
Wilmington, NC 28412

NPDES Permit No.: NCS000406

Reporting Year: July 1, 2014 – June 30, 2015

REPORTING 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 fines and imprisonment for knowing violations.

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David B. Mayes, P.E. Date

Manager, Stormwater Services

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INTRODUCTION

Stormwater Management Plan Overview

The North Carolina Division of Water Quality issued NPDES Phase II Permit NCS000406 to the City of Wilmington effective November 12, 2012. The Stormwater Management Plan is the City of Wilmington's program to comply with NPDES Phase II permit NCS000406 for stormwater discharges from Small Municipal Separate Storm Sewer Systems (MS4s). The plan defines strategies and guidelines necessary for protecting water quality and reducing pollutant discharges to the maximum extent practicable. The plan also includes reporting results for the current yearly reporting period from July 1, 2014 to June 30, 2015.

The plan is a guidance document to be used by the City staff and the general public. The plan is evolving and will address needs and priorities that will be reflected in compliance programs over the 5 year implementation schedule.

As required by EPA regulations for the NPDES Phase II stormwater programs, the following six minimum measures are addressed in the plan:

1. Public Education and Outreach
2. Public Participation and Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post-Construction Runoff Control
6. Pollution Prevention and Good Housekeeping for Municipal Operations

Program Implementation Status

The City of Wilmington is pleased to report excellent progress for year 2 compliance with requirements of NPDES Phase II permit NCS000406. Primary areas of work include:

- Continued implementation of amended ordinances related to Post Construction and Illicit Discharge BMPs.
- Continued mapping of stormwater infrastructure along with improvements to the dry weather flow monitoring program.
- Continuation of Public Outreach and Public Participation efforts.
- Continued implementation of SPPP and SPCC plans and inventory and recommendation plans of municipally owned operations with the potential to pollute.
- Implementation of several key actions of the Bradley and Hewletts Creek Watershed Restoration Plan, including the installation of a large bioretention area through the collaborative efforts of plan partners and stakeholders.

Wilmington continues to move forward with implementing the necessary goals and objectives as outlined in their permit. Considerable progress related to Illicit Discharge Detection and Elimination has been made during the past year with respect to dry weather flow monitoring and planning. We continue to have success with our public outreach and participation program and education to the public. The City remains focused on improving the water quality for the areas surrounding water bodies as indicated by UNCW's Center for Marine Science ambient monitoring of water quality on creeks within the City.

CITY OF WILMINGTON STORMWATER SERVICES OVERVIEW

Comprehensive Stormwater Management

Comprehensive stormwater management takes into account both the quantity and quality of stormwater runoff and is reflected in five core components of Wilmington's Stormwater Services program:

Management & Planning

Master planning utilizes the existing stormwater system inventory to develop a long range plan to improve drainage and water quality within an entire watershed. When planning on such a large scale, Stormwater Services seeks involvement and input from citizens and stakeholders. Management activities also include customer service – responding to customer concerns or inquiries and administrative services required for operation of the City stormwater utility.

Regulatory and Enforcement

Regulatory and enforcement activities are outlined in the City's existing stormwater ordinance requiring comprehensive stormwater management and creating technical standards for design and maintenance of private stormwater facilities. Stormwater Services also provides two semi-annual inspections for privately permitted stormwater retention facilities. These inspections are performed in order to ensure compliance with city maintenance standards. Compliance with NPDES Phase II stormwater regulations also fall into this category.

Capital Improvements

The stormwater utility provides dedicated funding and staff resources for planning, designing, and constructing capital projects. These projects are necessary when the existing storm drainage system is inadequate and can result in flooded streets, houses, and businesses. Capital improvement projects require collaboration among City departments, outside agencies, and citizens in affected areas. Whenever possible, capital projects incorporate innovative design or best management practices (BMPs) to improve water quality and reduce the quantity of stormwater runoff.

Operations and Maintenance

The City of Wilmington's Maintenance Division is responsible for maintaining the public drainage system. Maintenance activities consist of open drainage, closed drainage, street sweeping, and best management practices (BMPs). The open drainage system consists of roadside swales, ditches, channels, creeks, and ponds. The closed drainage system consists of pipes, culverts, catch basins, and manholes. Both of these systems are maintained using manual and mechanical techniques to insure that they remain open for proper drainage. Street sweeping provides preventative maintenance to minimize the amount of trash, debris,

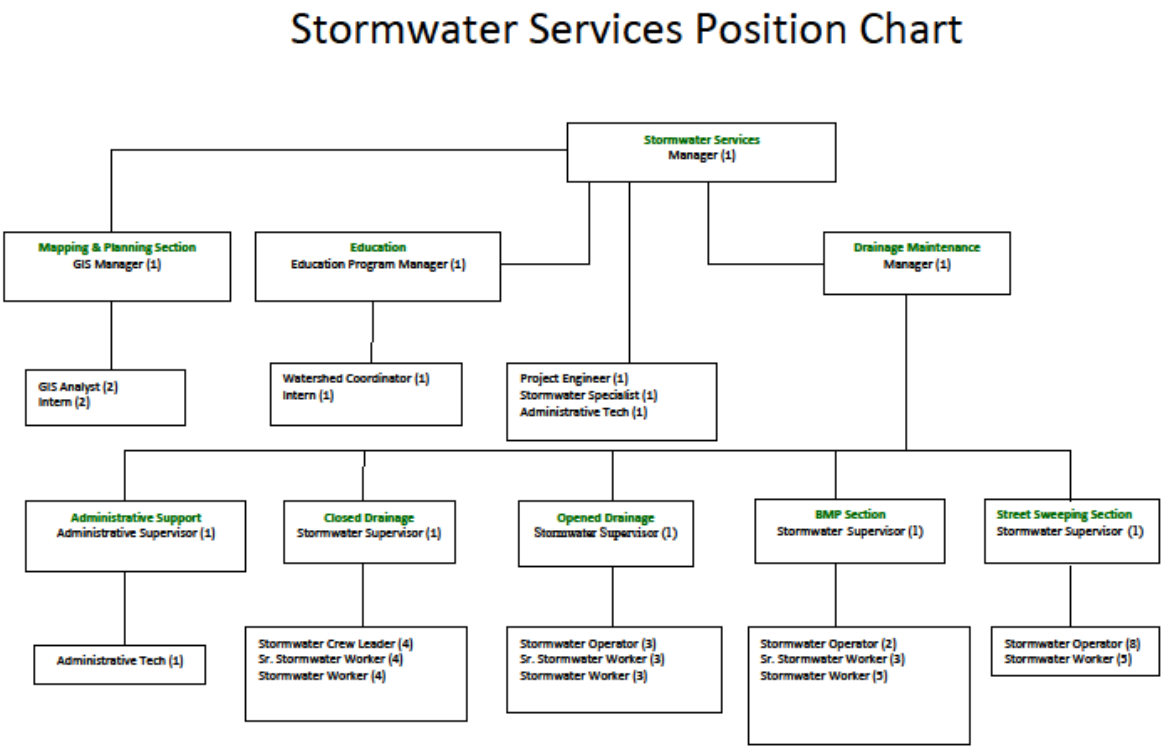
sediment, and other pollutants entering open or closed drainage routes. BMP maintenance consists of activities necessary to keep over 62 BMP sites including ponds, wetlands, and bio-retention areas in fully-functioning condition.

Water Quality

Water quality monitoring is executed by the University of North Carolina at Wilmington under annual contract with the City. Monitoring is performed on specific creeks and waterways within the City limits. Monitoring tests for specific pollutants and resulting data is used to plan capital improvement projects, guide outreach and education efforts, assess water quality at the sites monitored, identify persistent pollutant discharge areas or points, help to build a framework for future detection and tracing of pollutant sources and obtain grant funding. In addition, Stormwater Services implements an extensive outreach, education, and public involvement program that serves the citizens of Wilmington and includes a wide array of water quality education programming and materials. These programs include school presentations, homeowner association outreach, stormwater publications and giveaways, mass media advertising, special event exhibits, workshops, volunteer cleanups and storm drain marking, and collaborative efforts such as grant projects. These efforts strive to educate and engage citizens in protecting and improving local water quality through awareness, education, behavior modification and action.

Management and Planning

Organization Chart of the Stormwater Services Division



Estimated FY 15-16 Stormwater Management Fund Budget for NPDES

	FY 14-15 Adopted	FY 15-16 Adopted	
REVENUES			
Storm Water Utility Fees	6,482,279	7,291,414	
City Streets Storm Water Fees	2,073,600	2,249,917	
Storm Water Discharge permits	20,000	20,000	
NCDOT Drainage Maintenance	37,000	37,000	
Interest Earnings	25,039	44,231	
Miscellaneous	-	-	
Appropriated Fund Balance	-	-	
TOTAL REVENUES	8,637,918	9,642,562	
EXPENDITURES			
Public Services	5,154,710	5,143,894	
Non-Departmental	839,363	977,066	
Debt Service	2,043,845	2,421,602	
Contingency	100,000	100,000	
Transfer to Capital Project Fund	500,000	1,000,000	
TOTAL EXPENDITURES	8,637,918	9,642,562	[1]

[1] The FY 2016 budget was adopted by the Wilmington City Council on June 23, 2015

Regulatory and Enforcement

Public Services Code Enforcement

The City's stormwater ordinance required by this permit has been effective since November 1, 2009. Citizens can report suspected pollution through the Stormwater Hotline and the webpage reporting form. All complaints received by the Stormwater Division either from the public or from City staff is investigated; corrective action is prescribed; documented and followed until the violation is resolved. A Enforcement/Civil Penalty Guidance tool has been developed and is now being used to ensure consistency and help to guide the decision making process for NOVs and Civil Penalty issuance. Any complaints received that have environmental impacts other than stormwater or fall outside the City's regulatory authority are referred to DENR DWQ Wilmington Regional Office.

In an effort to maximize voluntary compliance, the City has, and will continue to develop and distribute educational materials to targeted populations in an aggressive manner. Consequently, all complaints provide the opportunity to educate the public on the issues that threaten stormwater, the best management practices for prevention, the awareness of our city's stormwater program, and the new ordinance.

Compliance through Public Education

The stormwater code enforcement program strives to maximize voluntary compliance through public education and use enforcement through penalties as a last resort. Staff has found that most stormwater ordinance violations can be resolved through public education. Most of the people encountered violating the ordinances are not even aware of their wrongdoings. Teaching them why they are in violation and why it matters works because most people want to do the right thing. There are very few repeat offenders. In Fiscal Year 2014, a total of 1 repeat offender was identified. Our enforcement and civil penalties are reserved for 1) serious discharges and spills with the potential of harming human health and the environment, 2) repeat offenders, and 3) as a last resort to achieve compliance.

The program developed an assortment of educational material for targeted audiences, as well as targeted pollutants that teach the public about our stormwater ordinance and pollution prevention. For other circumstance specific letters are written with instructions to guide violators to a solution and compliance expectations. This clear outline of the City's expectations is a powerful tool for preventing future pollution problems.

Yard Waste

Yard waste violations receive a face to face meeting and a standardized letter explaining the ordinance and the reasons why it is necessary. Also highlighted are the expectations for compliance and civil penalties for any future violations. This letter is accompanied by a poster in English or Spanish and in various sizes. The poster's objective is to help educate landscape companies and their employees on the ordinance requirements that keep yard waste out of the drainage system and surface waters and the city's expectations.

Pet Waste

Reports of pet waste violations receive a face to face meeting if possible. A brochure and flyer has been developed explaining the dangers of pet waste bacteria in surface waters and the city's expectations as well as the ordinance and penalty amounts for any violations. Pet waste message flags are used and distributed with ordinance information in parks and public places, and in specific neighborhoods in response to complaints. The pet waste flyer is also available in poster size for display when needed in parks and common areas.

Illicit Discharges

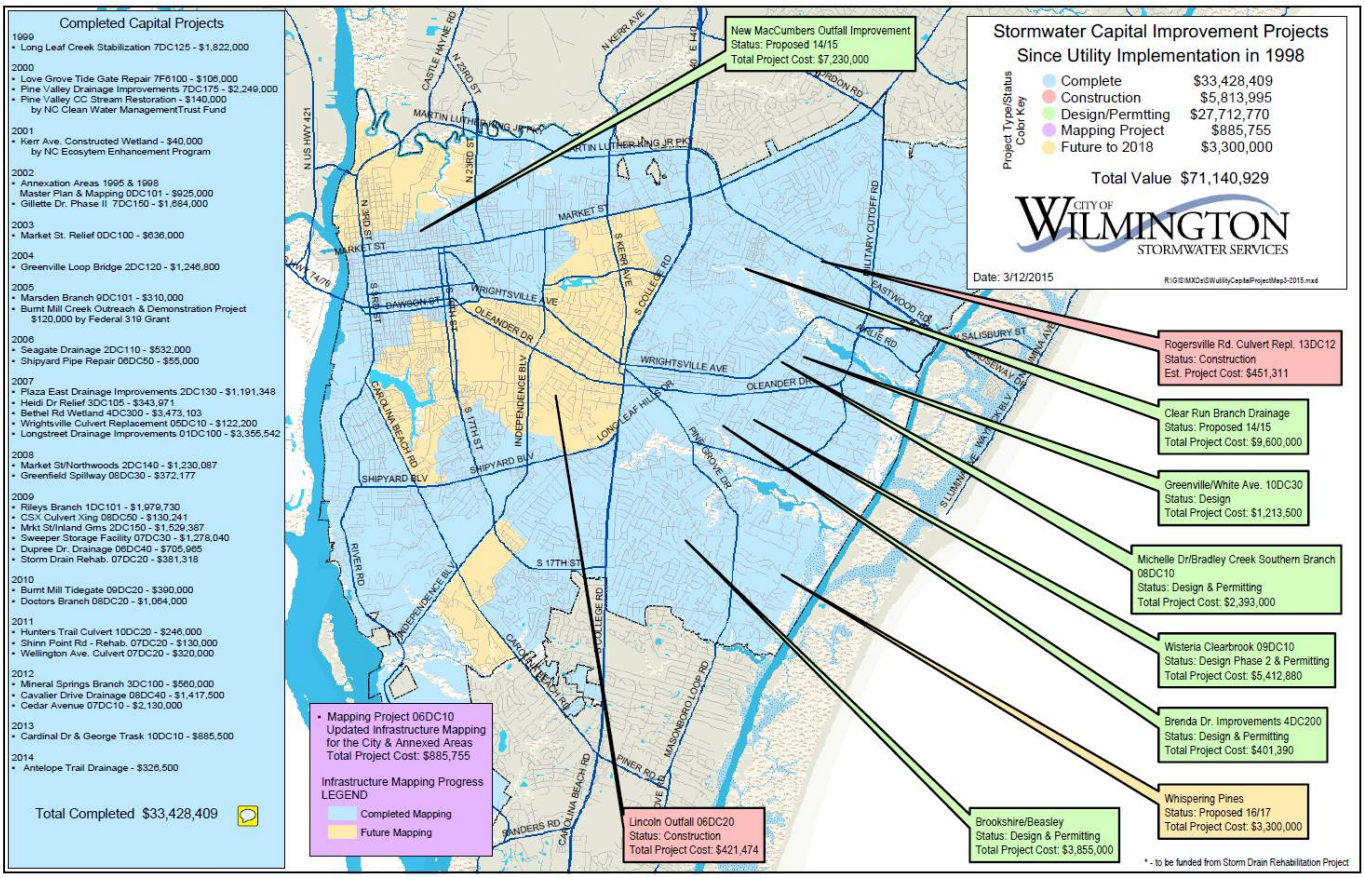
Reports of illicit discharges are addressed on a case by case basis. Informational posters and brochures for general use have been developed for distribution targeting the general public as well as specific source types that are typical in any urban area. These posters are kept on hand distributed to businesses on an as needed basis to inform and educate them and their employees in restaurants, vehicle maintenance facilities, construction sites, on industry specific issues and best management practices specific to their businesses on how to avoid and prevent stormwater pollution. For issues that require investigation, assessment and enforcement the process detailed in the Illicit Discharge Detection and Elimination Manual is followed.

Cape Fear Public Utility Authority

The Cape Fear Public Utility Authority (CFPUA) currently employs six 5 Environmental Compliance Officers that implement and enforce elements of the City's NPDES Wastewater Discharge Permit to include the City's Collection System Permit. As part of those requirements the group regulates sanitary sewer overflows (SSOs) and eliminates any wastewater or other polluted waters from leaving their system. They respond to reports and investigate leads generated by the public or monitoring results as part of their permit requirement and respond using public education, enforcement and maintenance. The CFPUA copies the City on all SSOs and follows up with monitoring results and clean up measures. The CFPUA has maintained right of entry on the properties that it services. The city and CFPUA are working together to keep open lines of communication, continue to build relationships and combine resources in a continued effort to locate chronic leaks and minimize release to MS4.

The CFPUA and the City continue to utilize the joint policy established in 2011 for the reporting and documentation of SSOs and leaks. This policy provides procedures for CFPUA to follow regarding reporting and documentation of SSOs the impact the City's MS4. These guidelines will enable the City to comply with Phase II reporting requirements as well as provide assistance to CFPUA in mitigating any potential threat to public health and environment. This policy is attached in Appendix D.

Capital Improvements



In-House Projects

Location	Pipe				Structures			BMP			Total Cost
	Amt.	Size	Type	Cost	Amt.	Type	Cost	Amt.	Type	Cost	
Dram Tree Park	68 ft.	6"	subdrain	$ 5,600.33							$ 5,600.33
Raintree Wetland								1	Inlet, 2 x 2 x 3	$ 12,679.49	$ 12,679.49
S. 9th St. & Dock St.	28 ft.	15"	RCP	$ 5,182.94							$ 5,182.94
118 Brookshire Lane	48 ft.	18"	RCP	$ 2,209.98	1	Casting, frame & grate 24 x 36	$ 2,152.99				$ 4,362.97
Brookview Rd & Sutton Dr.	84 ft.	12"	RCP	$ 5,485.10	1	Casting, frame & grate 24 x 36	$ 949.87				$ 6,434.97
2322 Canterwood Dr.	16 ft.	18"	RCP	$ 4,492.43							$ 4,492.43
Cromwell Circle & Lansdown Rd	36 ft.	15"	RCP	$ 2,392.77							$ 2,392.77
33 Darlington Ave	32 ft.	12"	RCP	$ 3,457.05	1	Casting, manhole cover 24"	$ 845.87				$ 4,302.92
					2	Casting, frame & grate 24 x 36					
	15.50 ft.	24"			1	Slab top, 5 x 5					
213 Derby Down Way	185 ft.	30"	RCP RCP	$ 45,018.90	1	Headwall	$ 9,130.32				$ 54,149.22
213 Devonshire Lane	192 ft.	36"	RCP	$ 32,337.68							$ 32,337.68
118 Disney Dr	34 ft	16 gauge	Aluminum	$ 4,309.20							$ 4,309.20
5435 Eastwind Rd.	40 ft	18"	RCP	$ 4,399.70							$ 4,399.70
	8 ft	12"	RCP		1	Casting, frame & grate 24 x 36					
124 Grainger Point Rd	136 ft.	18"	RCP	$ 11,944.84	1	Speciality bottom 5 x 5	$ 2,634.40				$ 14,579.24
605 Hampton Rd	136 ft.	24"	RCP	$ 4,103.37							$ 4,103.37
1919 Knollwood Dr	8 ft.	15"	RCP	$ 372.17	1	Casting, manhole cover 24"	$ 708.01				$ 1,080.18
Lancelot Lane & Darlington Ave	40 ft.	18"	RCP	$ 5,724.04							$ 5,724.04
					1	Headwall					
					1	Prefab slab bottom5 x 5					
					1	Casting, manhole complete 24"					
					1	Casting frame & grate 24 x 36					
6305 Marywood Dr	45 ft.	30"	RCP	$ 18,968.43	1	Slab top, 5 x 5	$ 16,245.54				$ 35,213.97
519 McEachern Ct	99 ft.	15"	RCP	$ 5,192.62	2	Casting, frame & grate 24 x 36	$ 2,679.61				$ 7,872.23
5706 Saint Nicholas Rd	32 ft.	15"	RCP	$ 1,942.98							$ 1,942.98
6208 Turtle Hall Dr	100 ft.	12"	RCP	$ 5,086.42							$ 5,086.42
314 Wallace Ave N	64 ft	12"	RCP	$ 4,648.58							$ 4,648.58
202 Windemere Rd	40 ft	15"	RCP	$ 1,390.18							$ 1,390.18
Yorkshire & Lansdown Rd	43 ft	15"	RCP	$ 2,517.55	1	prefab slab bottom 5 x 5 x 6	$ 1,067.47				$ 3,585.02
Nottingham Lane & Colony Cir N	50 ft	15"	Galavanized	$ 2,885.70							$ 2,885.70
5753 Oak Bluff Lane	68 ft.	15"	RCP	$ 11,085.76							$ 11,085.76
	6 ft	12"			2	Prefab tops, 5 x 5					
Orange St & Jasmine St	24 ft	15"	RCP RCP	$ 5,683.65	2	speciality bottoms, 5 x 5	$ 9,795.47				$ 15,479.12
374 RL Honeycutt Dr	94 ft	15"	RCP	$ 5,220.44	2	Inlet casting complete 24 x24	$ 917.63				$ 6,138.07
Total				**$ 201,652.81**			**$ 47,127.18**			**$ 12,679.49**	**$ 261,459.48**

Operations and Maintenance

Yearly Maintenance Activities Chart

	Amount	Unit of Measure	Total Labor Hrs.		Total Cost
SECTION 1: CONSTRUCTION					
C-1 Construction - Structure	22.00	each	1,262.00	$	58,731.06
C-1 Construction - Pipe	1,835.50	ft.	4,164.00	$	203,389.63
C-2 Construction - Flume					
C-3 Construction - Ditch		each			
C-3 Construction - BMP		each	218.00	$	12,679.49
C-0 Construction - Stock pile material	121.00	load	192.50	$	8,606.13
C-0 Construction - Plan work			303.00	$	15,459.84
			6,139.50	**$**	**298,866.15**
SECTION 2: INSPECTION					
I-1 Inspection - Closed			5,021.05	$	123,860.63
I-1 Inpection - Video	26,486.00	ft.	840.00	$	21,458.53
I-1 Inspection-Video data management			56.50	$	1,286.03
I-1 Inspection-new system					
I-1 Inspection-Survey					
I-2 Inspection-Open			756.75	$	17,872.42
I-3 Inspection-BMP	530.00	each	349.00	$	6,927.41
I-3 Inspection-Lake	4.00	each	10.00	$	203.22
I-4 Inspection-Tide gate					
I-0 Inspection-Miscellaneous					
I-0 Inspection-Plan work			7.00	$	203.96
			7,040.30	**$**	**171,812.20**
SECTION 3: MAINTENANCE					
M-1 Maintenance-BMP	787.00	each	4,803.50	$	124,580.78
M-1 Maintenance-Right of Way			3,270.50	$	90,814.60
M-2 Maintenance-Ditching manual	244,220.00	ft.	4,660.25	$	111,344.24
M-3 Maintenance-Ditching mechanical	18,637.00	ft.	1,653.00	$	64,582.50
M-4 Maintenance-Culvert	970.00	each	466.50	$	11,147.86
M-5 Maintenance-Pipe	91,476.00	ft.	2,538.50	$	71,811.90
M-5 Maintenance-Structure	14,168.00	each	3,939.20	$	101,340.34
M-5 Maintenance-Reset cover	231.00	each	290.00	$	6,791.06
M-6 Maintenance-Lake	49.00	each	677.50	$	19,586.82
M-7 Maintenance-Mowing	662,842.00	ft.	2,934.75	$	111,571.50
M-7 Maintenance-Mowing right of way	92.57	acre	367.00	$	14,985.02
M-8 Maintenance-Tide gate	6.00	each	36.00	$	775.32
M-9 Maintenance-Sweep streets	9,649.72	mile	4,994.50	$	325,672.16
M-9 Maintenance-Sweep support			2,785.00	$	92,377.73
M-10 Maintenance-Haul waste	316.00	load	288.50	$	13,288.68
M-10 Maintenance-Screen material			1,600.50	$	80,181.14
M-11 Maintenance-Vehicle			1,831.00	$	57,811.74
M-0 Maintenance-Yard			1,215.25	$	29,267.15
M-0 Maintenance-Plan work			2.00	$	46.70
			38,353.45	**$**	**1,327,977.24**
SECTION 4: REPAIR					
R-1 Repair-Pipe failure	201.00	each	4,643.00	$	169,102.98
R-2 Repair Pipe work	299.00	ft.	890.50	$	42,203.52
R-2 Repair-Convert structure	12.00	each	567.50	$	21,265.14
R-3 Repair Structure	91.00	each	1,546.00	$	54,903.27
R-4 Repair Erosion	2,489.00	ft.	437.50	$	21,303.81
R-5 Repair Replace cover	91.00	each	109.50	$	12,944.79
R-5 Repair Tidegate			124.50	$	3,733.07
R-0 Repair- Plan work			**8,318.50**	**$**	**325,456.58**

Water Quality

Monitoring Program Overview

In October 1997, the City of Wilmington contracted with the UNCW Center for Marine Science for a project with the goal of assessing water quality in Wilmington City watersheds under base flow conditions. Also, certain sites were analyzed for sediment heavy metals concentrations (EPA Priority Pollutants). New Hanover County also participated in this effort for tidal creeks outside of City jurisdiction. UNCW produced a combined report of results entitled Environmental Quality of Wilmington and New Hanover County Watersheds. Immediately below is an overview of their work methods. Following this overview is the executive summary of their most recent report.

The water quality data in these reports are presented from a watershed perspective. Some of the watersheds cross political boundaries (i.e. parts of the same watershed may lie in the County but not the City). Howe and Whiskey Creeks are examples. Water quality parameters analyzed in the tidal creeks include water temperature, pH, dissolved oxygen, salinity/conductivity, turbidity, nitrate, ammonium, orthophosphate, chlorophyll *a*, and in selected creeks fecal coliform bacteria. Similar analyses were carried out in the City watersheds with the addition of total nitrogen (TKN), total nitrogen (TN), total phosphorus (TP), total suspended solids (TSS) and biochemical oxygen demand (BOD) at selected sites.

Water Quality Methods

Field parameters were measured at each site using a YSI 6920 Multiparameter Water Quality Probe (sonde) linked to a YSI 650 MDS display unit. Individual probes within the instruments measured water temperature, pH, dissolved oxygen, turbidity, salinity, and conductivity. YSI Model 85 and 55 dissolved oxygen meters were also used on occasion. The instruments were calibrated prior to each sampling trip to ensure accurate measurements. The UNCW Aquatic Ecology laboratory is State-Certified for field measurements (temperature, conductivity, dissolved oxygen and pH) and for laboratory chlorophyll *a* measurements.

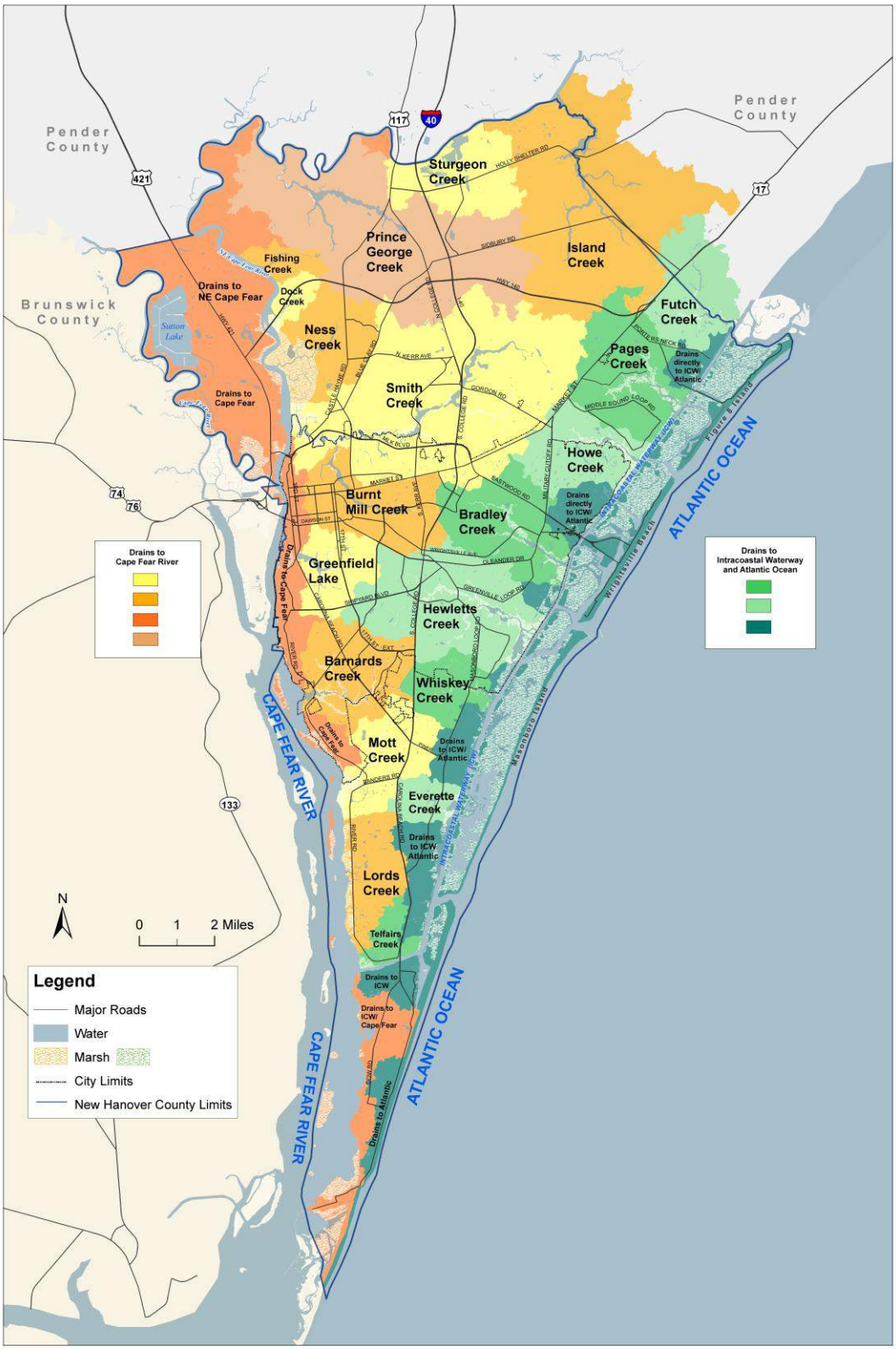
The analytical method used to measure chlorophyll *a* is described in Welschmeyer (1994) and US EPA (1997). Chlorophyll *a* concentrations were determined from the 1.0 micrometer glass fiber filters used for filtering samples for nitrate+nitrite and orthophosphate analyses. All filters were wrapped individually in aluminum foil, placed in an airtight container and stored in a freezer. During the analytical process, the glass filters were separately immersed in 10 ml of a 90% acetone solution. The acetone was allowed to extract the chlorophyll from the material for 18-24 hours. The solution containing the extracted chlorophyll was then analyzed for chlorophyll *a* concentration using a Turner AU-10 fluorometer. This method uses an optimal combination of excitation and emission bandwidths that reduces errors in the acidification technique.

Nutrients (nitrate, ammonium, total Kjeldahl nitrogen, total nitrogen, orthophosphate, and total phosphorus) and total suspended solids (TSS) were analyzed by a state-certified contract laboratory using EPA and APHA techniques. We also computed inorganic nitrogen to phosphorus

molar ratios for relevant sites (N/P). Fecal coliform concentrations were determined using a membrane filtration (mFC) method (APHA 1995).

For a large wet detention pond (Ann McCrary Pond on Burnt Mill Creek) and for a constructed wetland on Kerr Avenue (at the headwaters area of Burnt Mill Creek) UNCW collected data from input (control) and outfall stations. This data was used to test for statistically significant differences in pollutant concentrations between pond input and output stations. The data were first tested for normality using the Shapiro-Wilk test. Normally distributed data parameters were tested using the paired-difference t-test, and non-normally distributed data parameters were tested using the Wilcoxon Signed Rank test. Statistical analyses were conducted using SAS (Schlotzhauer and Littell 1987).

Wilmington (New Hanover County)Watersheds Map



Wilmington Watersheds Yearly Monitoring Report (UNCW)

ENVIRONMENTAL QUALITY OF WILMINGTON AND NEW HANOVER COUNTY WATERSHEDS, 2014

by

Michael A. Mallin, Matthew R. McIver, Anna R. Robuck and John D. Barker

CMS Report 15-01
Center for Marine Science
University of North Carolina Wilmington
Wilmington, N.C. 28409
March 2015

http://www.uncw.edu/cms/aelab/

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Executive Summary

This report represents combined results of Year 17 of the Wilmington Watersheds Project. Water quality data are presented from a watershed perspective, regardless of political boundaries. The 2014 program involved 7 watersheds and 22 sampling stations. In this summary we first present brief water quality overviews for each watershed from data collected between January and December 2014.

Barnards Creek – Barnards Creek drains into the Cape Fear River Estuary. It drains a 4,173 acre watershed that consists of 22.3% impervious surface coverage, and a population of approximately 12,200. Water column sampling was not funded during 2014.

Bradley Creek – Bradley Creek drains a watershed of 4,583 acres, including much of the UNCW campus, into the Atlantic Intracoastal Waterway (ICW). The watershed contains about 27.8% impervious surface coverage, with a population of about 16,470. Three sites were sampled, all from shore. In 2014 there were no significant algal blooms recorded, and average dissolved oxygen was good to fair at the three sites. All three sites sampled were rated poor due to high fecal coliform bacteria, with the south branch site BC-SB and the College Acres station BC-CA both having especially high counts.

Burnt Mill Creek – Burnt Mill Creek drains a 4,207 acre watershed with a population of about 23,700. Its watershed is extensively urbanized (39.8% impervious surface coverage) and drains into Smith Creek. Three locations were sampled during 2014. This creek had very poor water quality, with high fecal coliform counts occurring at two of the three sites exceeding the human contact standard > 80% of occasions sampled. One major and one minor algal bloom occurred in 2014. Dissolved oxygen concentrations were good in the upper creek and poor in the lower creek in 2014.

The effectiveness of Ann McCrary wet detention pond on Randall Parkway as a pollution control device for upper Burnt Mill Creek was mixed for 2014. Comparing inflows to outflows, there were significant increases in dissolved oxygen and pH, but also significant increases in total phosphorus, turbidity and total suspended solids. However, there were significant decreases in conductivity, fecal coliform counts, ammonium and nitrate. Several water quality parameters showed an increase in pollutant levels along the creek from the exit from the detention pond to the downstream Princess Place sampling station, including fecal coliform bacteria and nitrate.

Greenfield Lake – This lake drains a watershed of 2,465 acres, covered by about 37% impervious surface area with a population of about 10,630. This urban lake has suffered from low dissolved oxygen, algal blooms, periodic fish kills and high fecal bacteria counts over the years. The lake was sampled at four tributary sites and three in-lake sites. The four tributaries of Greenfield Lake (near Lake Branch Drive, 17th Street, Jumping Run Branch, and Lakeshore Commons Apartments) all suffered from low dissolved oxygen problems, as did one of the three in-lake stations.

Algal blooms are periodically problematic in Greenfield Lake, and have occurred during all seasons, but are primarily a problem in spring and summer. In 2014 algal blooms continued to occur in the lake. The continuing presence of the blooms has led NCDENR to propose (February 2014) that this lake be added to the NC 303(d) list for excessive chlorophyll *a*. In the period 2007-2013 there was a statistically significant relationship within the lake between chlorophyll *a* and BOD5, meaning that the algal blooms are an important cause of low dissolved oxygen in this lake. Stormwater runoff into the streams also contributes BOD materials into the lake. In 2014 all tributary stations and two in-lake stations exceeded the fecal coliform State standard on 50% or more of occasions sampled.

Beginning in 2005 several steps were taken by the City of Wilmington to restore viability to the lake. Sterile grass carp were introduced to the lake to control (by grazing) the overabundant aquatic macrophytes, and four SolarBee water circulation systems were installed in the lake to improve circulation and force dissolved oxygen from the surface downward toward the bottom. Also, on several occasions a contract firm and City staff applied herbicides to further reduce the amount of aquatic macrophytes. These actions led to a major reduction in aquatic macrophytes lake-wide, and improved in-lake dissolved oxygen content. However, the times that chlorophyll *a* concentrations exceeded the state standard have tripled since the installation of the mixers, addition of herbicides, and grass carp introductions.

Hewletts Creek – Hewletts Creek drains a large (7,478 acre) watershed into the Intracoastal Waterway. This watershed has about 25.1% impervious surface coverage with a population of about 20,210. In 2014 the creek was sampled at four tidal sites and one non-tidal freshwater site.

Incidents of low dissolved oxygen were rare in 2014. Turbidity was low, and only one large algal bloom was documented in 2014. Fecal coliform bacteria counts exceeded State standards on 100% of the time at MB-PGR and 83% of the time at NB-GLR, 67% of the time at PVGC-9, and 33% of the time at SB-PGR. The geometric means at PVGC-9, MB-PGR and NB-GLR all well exceeded 200 CFU/100 mL for a poor rating for this pollutant parameter, but the geometric mean of fecal bacteria counts at SB-PGR was well under the standard at 130 CFU/100 mL.

During 2007 the 7.6 acre JEL Wade wetland (located at the end of Bethel Road) was constructed to treat stormwater runoff from a 589 acre watershed within the Hewletts Creek drainage. Drainage for this wetland enters the south branch of the creek, upstream of the SB-PGR sampling site. This constructed wetland has continued to function extremely well in reduction of nutrients and fecal bacteria from stormwater inputs. Additionally, sampling data collected downstream of the wetland at Station SB-PGR shows a statistically significant decline in ammonium and nitrate and near significant decrease in fecal coliform bacteria after completion of the wetland, demonstrating the wetland's benefits to the creek system as a whole.

Howe Creek – Howe Creek drains a 3,516 acre watershed into the ICW. This watershed hosts a population of approximately 6,460 with about 21.4% impervious surface coverage. Two stations were sampled in Howe Creek in 2014. Several minor algal blooms occurred, but none exceeded the NC standard. The uppermost station HW-DT was rated poor for high fecal coliform bacteria counts, exceeding the state standard on 83% of the times sampled, while HW-GP was also rated poor, exceeding the standard on 67% of occasions sampled. Dissolved oxygen concentrations were rated fair at both sample sites in 2014.

Motts Creek – Motts Creek drains a watershed of 3,342 acres into the Cape Fear River Estuary with a population of about 9,530; impervious surface coverage 23.4%. This creek was not sampled for water quality by UNCW in 2014.

Smith Creek – Smith Creek drains into the lower Northeast Cape Fear River just upstream of where it merges with the Cape Fear River. It has a watershed of 16,650 acres that has about 21.3% impervious surface coverage, with a population of about 31,780. One estuarine site on Smith Creek, SC-CH, was sampled by UNCW under the auspices of the Lower Cape Fear River Program (LCFRP).

The dissolved oxygen standard for Smith Creek, which is rated as C Sw waters is 4.0 mg/L, which was violated one time in our 2014 samples. The North Carolina turbidity standard for estuarine waters (25 NTU) was not exceeded. There were no algal blooms present upon any of our 2014 sampling occasions. Fecal coliform bacterial concentrations exceeded 200 CFU/100 mL on 17% of samples in 2014, for a Fair rating, although no samples were unusually high.

Whiskey Creek – Whiskey Creek is the southernmost large tidal creek in New Hanover County that drains into the ICW. It has a watershed of 2,078 acres, a population of about 8,000, and is covered by approximately 25.1% impervious surface area. One station, on Masonboro Loop Road, was sampled from shore along this creek in 2014. This site had low to moderate nutrient concentrations and no algal bloom problems. Dissolved oxygen was substandard (below 5.0 mg/L) on one of six occasions sampled, whereas fecal coliform bacteria counts were above standard on 33% of occasions sampled.

Water Quality Station Ratings – The UNC Wilmington Aquatic Ecology Laboratory utilizes a quantitative system with four parameters (dissolved oxygen, chlorophyll *a*, turbidity, and fecal coliform bacteria) to rate water quality at our sampling sites. If a site exceeds the North Carolina water quality standard (see Appendix A) for a parameter less than 10% of the time sampled, it is rated Good; if it exceeds the standard 10-25% of the time it is rated Fair, and if it exceeds the standard > 25% of the time it is rated Poor for that parameter. We applied these numerical standards to the water bodies described in this report, based on 2014 data, and have designated each station as good, fair, and poor accordingly (Appendix B).

Fecal coliform bacterial conditions for the entire Wilmington City and New Hanover County Watersheds system (22 sites sampled for fecal coliforms) showed 0% (i.e.

none) to be in good condition, 18% in fair condition, but **82%** in poor condition, same as in 2013. Dissolved oxygen conditions system-wide (22 sites) showed 41% of the sites were in good condition, 36% were in fair condition, and 23% were in poor condition, a deterioration from 2013. For algal bloom presence, measured as chlorophyll *a*, 73% of the 22 stations sampled were rated as good, 14% as fair and 14% as poor. For turbidity, all 22 of the 22 sites sampled were rated as good. It is important to note that the water bodies with the worst water quality in the system also have the most developed watersheds with the highest impervious surface coverage; Burnt Mill Creek – 39% impervious coverage; Greenfield Lake – 37% impervious coverage; Bradley Creek – 28% impervious coverage.

2014-2015 NPDES PROGRAM HIGHLIGHTS & ANNUAL REPORTING

Public Education & Outreach

- 74 Enviroscape watershed presentations delivered to 8th grade science classes in New Hanover County serving over 2,200 students.
- Final year of a three-year survey to restaurants in the City of Wilmington concluded with 90-95% correct response rate to water quality and stormwater ordinance questions. The survey and educational materials were mailed to 453 restaurants over the course of 3 years.

Public Involvement & Participation

- Public and one-on-one meetings were held for the Brookshire/Beasley stormwater improvement project and doorhangers/notices were distributed for Antelope Trail, Andover Road, South Bradley Creek, and Gillette Drive and Rogersville Road projects.
- 33 storm drain markers were placed by volunteers in the Independence South and Greenfield Lake areas this year. Educational doorhangers were distributed in these areas as well.
- 10 watershed cleanups involving 139 volunteers contributing 245 volunteer hours and collecting over 207 thirty-gallon bags of trash

Illicit Discharge Detection and Elimination (IDDE)

- Stormwater infrastructure mapping has continued with the goal of mapping the public drainage system throughout the City.
- The City improved its procedures for collecting data for dry weather flow monitoring during this reporting period. Investigations have begun on a scheduled basis.
- The City conducted 3 dry weather flow investigation segments in the Burnt Mill Creek and Upper Cape Fear River watersheds.

Post-Construction Site Runoff Controls

- Continued implementing the City's Land Ordinance Code to provide post construction controls to meet the requirements of the City's Phase II permit and to bring the ordinance into compliance with the recent Coastal Stormwater Legislation.
- Continued site plan reviews of all new development and redeveloped sites.
- Conducted inspections on privately owned BMPs located within the City limits in order to ensure that maintenance requirements were being met by property owners.

Pollution Prevention and Good Housekeeping for Municipal Operations

- Continued implementation of BMPs in SPPP for Fleet Maintenance Facility.
- Continued documentation for SPPP and SPCC plans.
- Began implementing BMPs for recommendation plans for several City facilities with the potential to pollute.
- Planning for water quality improvements to existing City maintenance activities for Stormwater, Streets, Parks and Recreation departments.

Voluntary Watershed Restoration Plan

- Planning and installation of the Tidal Creek Community Rain Garden on Oleander Drive.
- Presentation of the restoration plan at North Carolina LID Summit in Raleigh, NC, and the

Tidal Creek Summit in Wilmington, NC.

- Developed educational mailing for target watershed residents and businesses concentrating on pet waste as the primary source of bacteria in local tidal creeks.
- Completed development of HOW website, brochure, and Make-A-Ripple outreach materials.

PUBLIC EDUCATION AND OUTREACH

1. Objectives for Public Education and Outreach

a. Implement a public outreach and education program, locally or through cooperative or contractual agreement, which includes a combination of approaches designed to reach the public and target audiences with stormwater pollution prevention messages.

b. Distribute educational materials and information and conduct outreach/education activities for the community, which address the impacts of stormwater discharges on water bodies and the steps the public can take to reduce stormwater pollution.

2. BMPs for Public Education and Outreach

The permittee shall implement the following BMPs to meet the objectives of the Public Education and Outreach Program.

BMP	Measurable Goals
a. Define outreach/education program goals including a description of the target pollutants, sources, and target audiences	Define goals and objectives of the outreach/education program to include a description of target pollutants or stressors, likely residential and/or industrial and commercial sources of these pollutants, target audiences for each pollutant and why they were selected, and key outreach messages. Update this section as necessary to reflect changes in the target audience, public awareness, etc.

Accomplishments:

A comprehensive plan including our outreach/education program goals and objectives and target pollutants, sources and audiences is included in the Public Education and Outreach Appendix. The plan defines the origin and sources of each pollutant, target audience(s), and includes suggested outreach strategies and key outreach messages. Staff regularly uses this information as a guide for planning, implementing, and evaluating outreach and education efforts throughout the city. The plan is updated and modified as pollutant sources, target audience demographics, public awareness, water quality, and other program variables change over time.

b. Distribute public education materials and information to identified target audiences and user groups. For example, schools, homeowners, and/or businesses.	The permittee shall distribute stormwater educational materials and information to appropriate target groups. Instead of developing its own materials, the permittee may rely on Public Education and Outreach materials supplied by the state, and/or other entities through a cooperative or contractual agreement, as available, when implementing its own program.

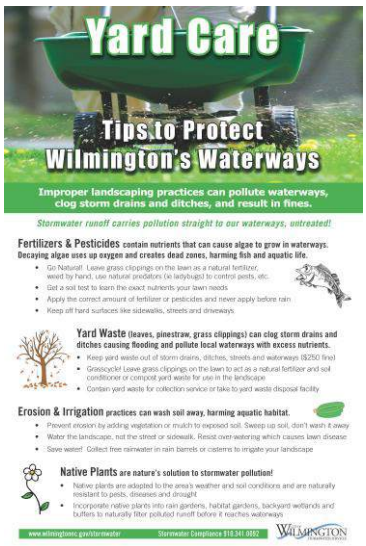
Accomplishments:

Stormwater education staff made several presentations to conferences and civic groups this year including the UNCW graduate and undergraduate environmental classes and Cape Fear Community College Sustainability class.

Enviroscape Watershed Education Presentations were given to all 8th grade science classes in New Hanover County Schools, serving approximately 74 classes and 2,200 students.

Stormwater education and code enforcement staff continued an effort to educate restaurants within the Wilmington city limits and evaluate our public awareness and education efforts through an educational mailing and return survey. 2015 was the final year of these Restaurant surveys and educational mailings.

In all, surveys and materials were mailed to and received by 453 restaurants over the course of 3 years. Although the response rate was 10-11% each year, 2015 actually had the highest rate of returned surveys. The survey questions were aimed at gauging awareness and understanding of stormwater and proper restaurant practices. The majority of respondents answered these questions correctly each year. With yearly response rates ranging from 90-95% for correct responses, this told us that the restaurant managers/owners understood where stormwater runoff drains to, how improper restaurant practices can pollute waterways, the city's stormwater ordinance as it pertains to restaurants, and whether or not they will implement new restaurant practices to protect water quality or are already using the proper practices. Interestingly, the majority of survey respondents reported that they were already implementing the proper practices, with a handful saying they would implement new practices. Overall, the high rate of correct responses indicate that our education and enforcement methods have been effective with this target audience.



This year a large-format (13”x19”) Yard Care education poster was developed for distribution to residents and landscapers. This is an all-emcompassing poster which briefly highlights the major areas of yard care that can impact stormwater runoff. These included fertilizers/pesticides, yard waste, erosion, irrigation and solutions for these issues. The poster is being distributed by the Stormwater Compliance Officer and education staff at events and educational happenings. The poster has also been uploaded to the stormwater education webpage so that citizens are able to print it.

Several significant signage projects were initiated and completed this year. These included development of a new Pet Waste Pilot Program that aims to educate the public and private sector through moveable educational signage in conjunction with code enforcement. Another project was the redesign of the Stormwater Demonstration Site (Anne McCrary Park) signage which needed replacement after 12 years of wear and tear and UV damage. 14 different BMP signs were designed and will be installed this month. Finally, new Stormwater Hotline signs and replacements for missing watershed signs were ordered to be installed along area roadways in 2015.

c. Informational Web Site	The permittee shall promote and maintain an internet web site designed to convey the program's message(s).

The internet is a powerful tool for disseminating stormwater education and pollutant information. Stormwater staff continues to maintain and update our well-developed website on a regular basis. The website features stormwater education information, current news and events, capital project notices and descriptions, hotline reporting webform, Enviroscape 8th grade program information, storm drain marking program information, UNCW monitoring data, maintenance activities, educational print materials and videos (brochures, newsletters, local watershed map, posters, documentaries, PSAs, etc.), and much more.

We continue to promote and drive citizens to our website through inclusion on staff business cards, print materials, paid television and radio public service announcements (PSAs), citywide Stormwater Watch newsletter, community presentations and signage. The shorter web address has proven invaluable and easier for citizens to find our website and specific content: www.wilmingtonnc.gov/stormwater

This past year, the Stormwater Capital Projects page was significantly refreshed and updated to include new projects, new maps and updated information.
In 2016, the city will be ushering in a new website design for the entire City of Wilmington website. Since Stormwater Services has a significant website presence, our staff has been involved in the selection of the consulting firm that will design and implement the new website. Our staff will have the task of reworking and redeveloping our stormwater webpages for the new site. This upgraded website will allow for a better end-user experience.

Maintain Hotline/Help line	The permittee shall promote and maintain a hotline for citizens and businesses to report suspected stormwater pollution and illicit discharges occurring within the City.

Accomplishments:

The Stormwater Pollution Prevention hotline was established in January 2010 to field calls from citizens, businesses and employees to report illicit discharges and instances of potential or definitive

stormwater pollution. The hotline phone # is 910-341-1020 and the web address is www.wilmingtonnc.gov/reportstormwaterpollution.

Hotline/web reports are routed to the Stormwater Code Compliance Officer who tracks, investigates, and responds to each hotline report. The hotline and online reporting webform are advertised on the City's cable TV channel and via the stormwater website, citywide newsletters, public presentations, large educational magnets on stormwater fleet vehicles, and promotional outreach items including pens, refrigerator magnets, and post-it notes giveaways to the public. To summarize hotline activity this past year: 6 calls placed to the City's Stormwater hotline, 1 online web form report was submitted, 22 emails and 13 calls were received by the Compliance Officer. The nature of the hotline reports are found in the Enforcement section of the Appendix.

In 2015, 20 new stormwater hotline signs were fabricated in order to be placed on the remaining watershed signs throughout the city. The hotline signs include the phone # where citizens can report instances or potential sources of water pollution. Next year, we will add signs to the remaining signposts in the city.

d. Extent of Exposure/Reporting Requirements	For each event, activity, or media, including those elements implemented locally or through a cooperative or contractual agreement, the permittee shall estimate and record the extent of exposure.

Accomplishments:

The extent of exposure requirement is extensively documented in tables in the Public Education Appendix, as well as the Public Involvement Appendix. Documentation includes the date of event or activity, the type of event/activity, audience reached, who delivered the content, the method of delivery and/or message, and the resulting attendance or participation.

Assessment of Program Implementation

The outreach and education program continues to implement a variety of activities and programs that meet or exceed the minimum requirements of our NPDES permit. We have fulfilled NPDES requirements and internal goals for this annual reporting period.

Objectives for Next Year

- Develop pet waste database to implement survey of pet owners regarding pet waste (bacterial) pollution and solutions.
- Install new watershed and stormwater pollution prevention hotline signage on area roadways.
- Continue the newly implemented Pet Waste Signage Pilot Program to place educational signage in public easements and other areas of town based on staff recommendations and citizen complaints of problem areas with uncollected pet waste.
- Deliver the Enviroscape Watershed program to 8th grade science classes in NHC Schools.
- Develop content for the citywide Annual Spring Stormwater Watch public newsletter, to include UNCW's annual water quality data and the State's 303(d) list data.
- Education manager will attend Statewide EENC/ Southeastern Environmental Education

Conference, as well as continue to pursue EE recertification through the NC Office of EE.

PUBLIC INVOLVEMENT AND PARTICIPATION

1. Objectives for Public Involvement and Participation

Involve the community in the development and implementation of the stormwater program by implementing a public involvement and participation program locally or through cooperative or contractual agreement.

2. BMPs for Public Involvement and Participation

The permittee shall implement the following BMPs to meet the objectives of the Public Involvement and Participation Program.

BMP	Measurable Goals
a. Volunteer community involvement program	The permittee shall include and promote volunteer opportunities designed to promote ongoing citizen participation, implemented locally or through cooperative or contractual agreement.

Accomplishments:

The City of Wilmington Stormwater Services contracts annually with Cape Fear River Watch (CFRW) and New Hanover Soil & Water Conservation District (NHSWCD) to implement public involvement and participation activities, as well as public education and outreach services. Both organizations sign an annual contract with the City which specifies services and deliverables that enable Stormwater Services to meet many of its NPDES public education and involvement requirements. In addition to full time staff, each agency taps into a volunteer base and encourages citizens to be involved in the implementation of public involvement and public participation activities.

Services performed by CFRW & NHSWCD include activities such as volunteer watershed clean-up events, volunteer creek monitoring, wetland monitoring and plantings, educational workshops for the schools and the community, participation in the Lower Cape Fear Stewardship Awards program, monthly rain barrel sale, LID consultation, volunteer storm drain marking, public eco-tours and high school Envirothons, community stormwater best management practice (BMP) installations via NC CCAP, website updates, and more.

Each agency provides the City with four quarterly progress reports and invoices during the annual contract period for services performed. The cumulative Year End progress report for each agency is included in the Public Involvement and Participation Appendix of this annual report.

Please visit the Public Involvement and Participation Appendix for activities accomplished by Cape Fear River Watch and New Hanover Soil & Water Conservation District during this period.

In June 2015, the city implemented 4 education learning sessions for the public, as well as city staff. The purpose was to revitalize the Stormwater Demonstration Site (SWDS) in Anne McCrary Park by replanting the following Best Management Practices (BMPs): Rain Garden, Bioretention Area, Habitat Garden, Native Plants & Tree area, and Roadside Buffer/Xeriscape Area. The

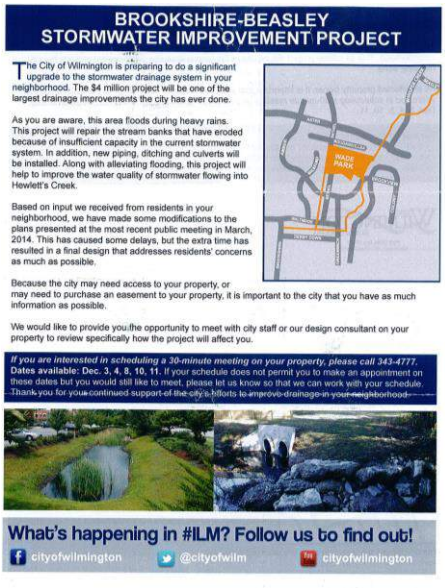
education sessions included an overview of stormwater, watersheds, the SWDS, the specific BMP, and proper planting techniques, ID and maintenance. Volunteers from UNCW, the NC Aquarium at Fort Fisher, and Cape Fear Community College participated during the four installation days.

b. Mechanism for Public involvement	The permittee shall provide and promote a mechanism for public involvement that provides for input on stormwater issues and the stormwater program, implemented locally or through cooperative or contractual agreement. These mechanisms could include public meetings, citizen/business surveys, citizen portal website feedback, public event participation, one-on-one citizen contact, etc.

Accomplishments:

We jointly participate in a monthly rain barrel sale which is organized by the New Hanover Soil & Water Conservation District. Rain Barrel USA, a North Carolina company, is our current vendor for the sale, enabling us to offer 60 and 80 gallon rain barrels at a discounted price to the public. The sale is publicized through a variety of media outlets including city and county public TV and websites, press releases, garden shows, and special events. This year, 40 rain barrels were sold to the public.

Stormwater Services conducted meetings with interested residents in December 2014 regarding the Brookshire/Beasley stormwater drainage improvement project. Project notices were also mailed to residents affected by drainage projects for Andover Road, Gillette Drive, South Bradley Creek, and Rogersville Road.


BROOKSHIRE-BEASLEY
STORMWATER IMPROVEMENT PROJECT

The City of Wilmington is preparing to do a significant upgrade to the stormwater drainage system in your neighborhood. The $4 million project will be one of the largest drainage improvements the city has ever done.

As you are aware, this area floods during heavy rains. This project will repair the stream banks that have eroded because of insufficient capacity in the current stormwater system. In addition, new piping, ditching and culverts will be installed. Along with alleviating flooding, this project will help to improve the water quality of stormwater flowing into Hewlett's Creek.

Based on input we received from residents in your neighborhood, we have made some modifications to the plans presented at the most recent public meeting in March, 2014. This has caused some delays, but the extra time has resulted in a final design that addresses residents' concerns as much as possible.

Because the city may need access to your property, or may need to purchase an easement to your property, it is important to the city that you have as much information as possible.

We would like to provide you the opportunity to meet with city staff or our design consultant on your property to review specifically how the project will affect you.

If you are interested in scheduling a 30-minute meeting on your property, please call 343-4777.
Dates available: Dec. 3, 4, 8, 10, 11. If your schedule does not permit you to make an appointment on these dates but you would still like to meet, please let us know so that we can work with your schedule.
Thank you for your continued support of the city's efforts to improve drainage in your neighborhood.

What's happening in #ILM? Follow us to find out!
cityofwilmington @cityofwilm cityofwilmington

Stormwater education and code enforcement staff concluded an effort to educate restaurants within the Wilmington city limits and evaluate our education and public awareness efforts through an educational mailing and return survey. The survey was mailed to 453 restaurants over the course of 3 years. The majority of respondents answered these questions correctly each year. With yearly response rates ranging from 90-95% for correct responses, this told us that the restaurant

managers/owners understood where stormwater runoff drains to, how improper restaurant practices can pollute waterways, the city's stormwater ordinance as it pertains to restaurants, and whether or not they will implement new restaurant practices to protect water quality or are already using the proper practices.

Hotline/Help line	The permittee shall promote and maintain a hotline for citizens and businesses to report suspected stormwater pollution and illicit discharges occurring within the City.

Accomplishments:
The Stormwater Pollution Prevention hotline was established in January 2010 to field calls from citizens, businesses and employees to report illicit discharges and instances of potential or definitive stormwater pollution. The hotline phone # is 910-341-1020 and the web address is www.wilmingtonnc.gov/reportstormwaterpollution.

Hotline/web reports are routed to the Stormwater Code Compliance Officer who tracks, investigates, and responds to each hotline report. The hotline and online reporting webform are advertised on the City's cable TV channel and via the stormwater website, citywide newsletters, public presentations, large educational magnets on stormwater fleet vehicles, and promotional outreach items including pens, refrigerator magnets, and post-it notes giveaways to the public. To summarize hotline activity this past year: 6 calls placed to the City's Stormwater hotline, 1 online web form report was submitted, 22 emails and 13 calls were received by the Compliance Officer. The nature of the hotline reports are found in the Enforcement section of the Appendix.

Assessment of Program Implementation
The City has continued to partner with contract agencies to implement public education, involvement and participation activities. These annual, contractual agreements have resulted in numerous public and action-oriented activities including watershed cleanups, storm drain marking, community workshops, grant partnerships, monthly rain barrel sale, eco-tours, BMP installations, and more.

This past year, the city also conducted efforts to reach out to the public regarding the implementation of drainage projects including the Brookshire Beasley drainage project and other in-house projects.

Objectives for Next Year

- Utilize partner agencies to implement community-focused initiatives such as storm drain marking, watershed cleanups, Canines for Clean Water events, etc.
- Conduct public outreach and meetings for upcoming stormwater drainage projects.
- Promote Stormwater Pollution Prevention Hotline by posting hotline signage throughout city watersheds and promoting the hotline at events and talks within the community.

ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE)

1. Objectives for Illicit Discharge Detection and Elimination

a. Implement and enforce a program to address the detection and elimination of illicit discharges into the MS4.

b. Maintain a storm sewer system map, showing the location of all major outfalls and the names and location of all waters of the United States that receive discharges from those outfalls;

c. Prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges except as allowed in this permit and implement appropriate enforcement procedures and **actions;**

d. Implement a plan to detect and address non-storm water discharges, including illegal dumping, to the MS4;

e. Inform public, employees, businesses, and the general public of hazards associated with illegal discharges, how to recognize illicit discharges and improper disposal of waste; and

f. Address non-storm water discharges or flows as identified in Part I, Paragraph (8).

2. BMPs for Illicit Discharge Detection and Elimination

The permittee shall implement the following BMPs to meet the objectives of the Illicit Discharge Detection and Elimination Program and shall notify the Division prior to modification of any goals.

BMP	Measurable Goals
a. Maintain adequate legal authorities	The permittee shall annually review the permittee's IDDE ordinances or other regulatory mechanisms, or adopt any new ordinances or other regulatory mechanisms that provide the permittee with adequate legal authority to prohibit illicit connections and discharges and enforce the approved IDDE Program.

Accomplishments:

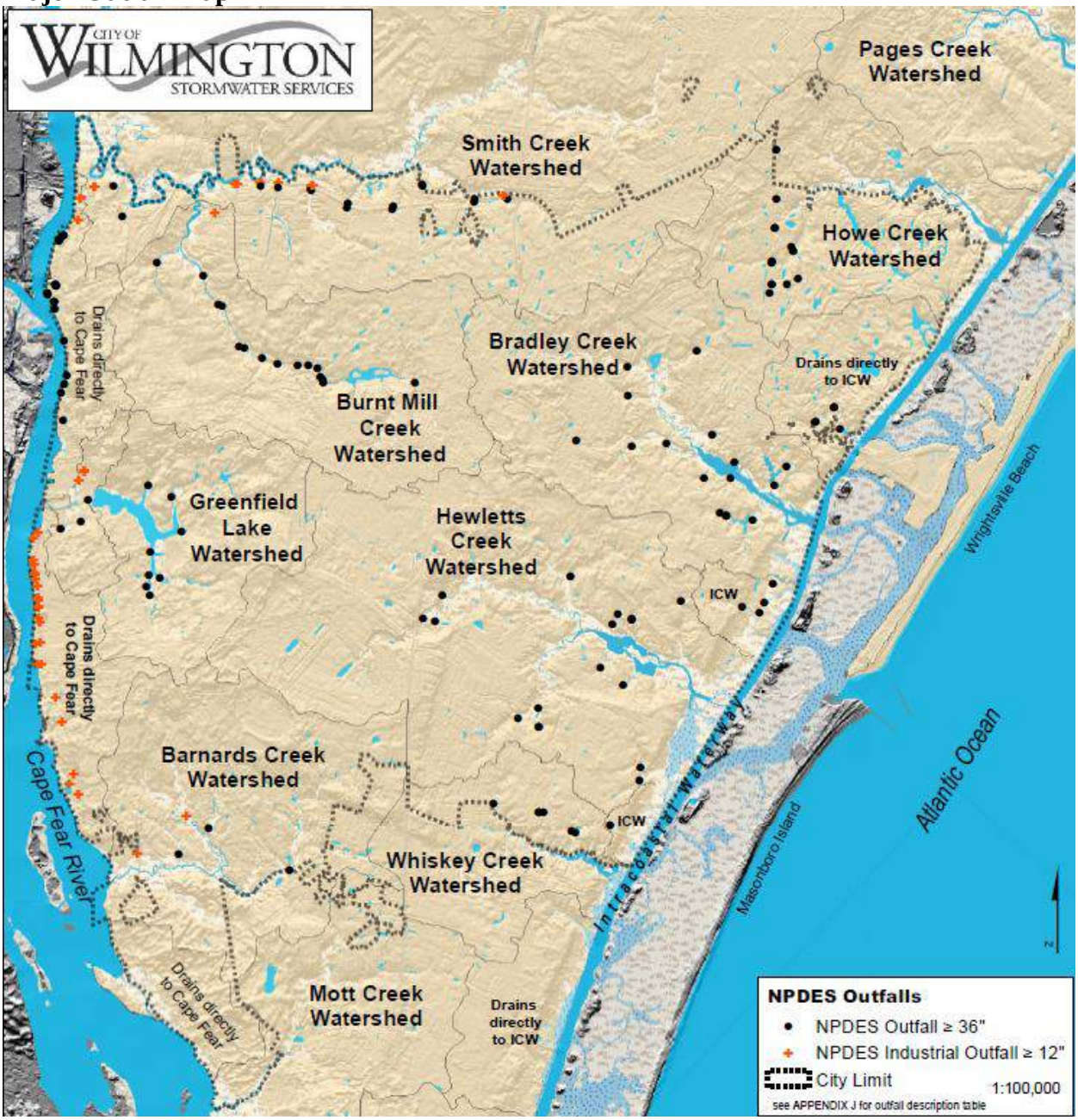
The City continues to utilize the existing ordinances in place to address illicit discharges to its system. The City passed the Ordinance to amend Chapter 12 of the City Code on 9/15/2009 to address illicit discharges to the stormwater system and to protect public water and sewer systems. This Ordinance change went into effect on November 1, 2009.

The current Cape Fear Public Utility Authority (CFPUA) ordinance defines wastewaters that are required to be discharged into the sanitary sewer system. The City utilizes CFPUA's ordinance to address discharges of regulated wastewaters to the City's MS4 and other natural outlets.

The City will continue to review its ordinance annually to make sure we are providing adequate legal authority.

b. Maintain a Storm Sewer System Base Map of Major Outfalls.	The permittee shall maintain a current map showing major outfalls and receiving streams

Major Outfall Map



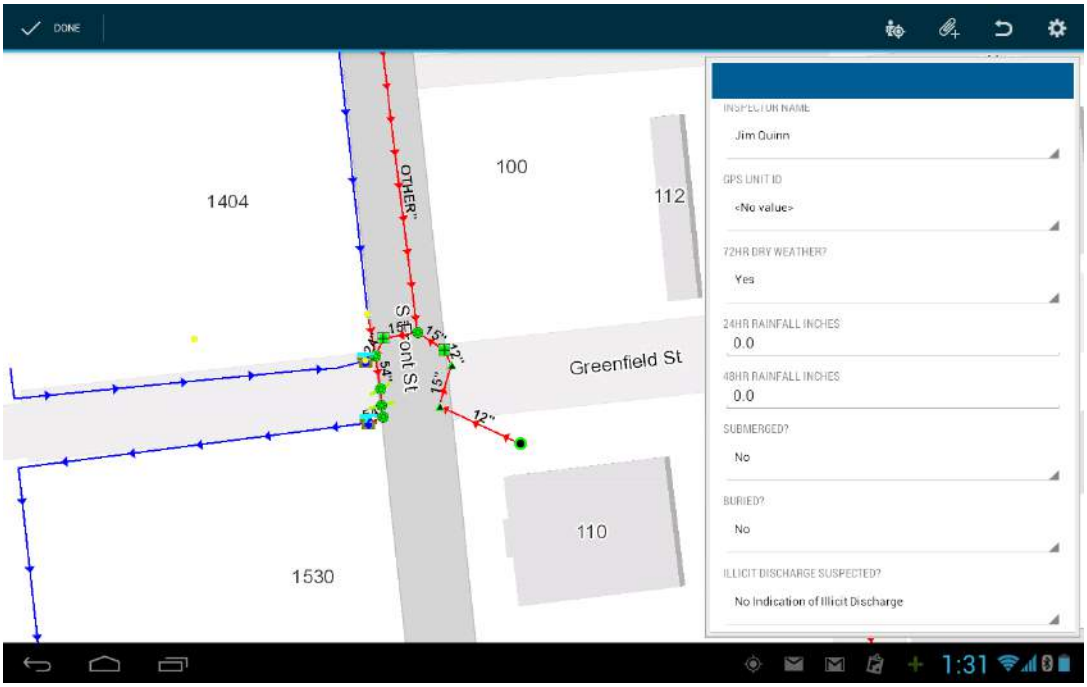
Accomplishments:
The City continues to maintain and update a base map of major outfalls and receiving water bodies. Outfalls are classified and added to the GIS dataset as mapping of the City MS4 proceeds. Additionally, the City has made significant improvements to the GIS mapping of watershed boundaries using the best available data.

Stormwater Inventory Mapping was identified as a need in the Greenfield Lake Watershed, an impaired water body as noted on the 303d list. The City has begun identifying sub-areas within the watershed for inventory mapping. Major outfalls have been already identified so the mapping of the systems leading into these outfalls will help in the dry weather flow monitoring program and potential pollution sources leading into the lake.

c. Detect dry weather flows	The permittee shall develop and implement a program for conducting dry weather flow field observations in accordance with a written procedure for detecting and removing the sources of illicit discharges.

Accomplishments:
The City has improved its procedures for collecting data for dry weather flow monitoring during this reporting period. New staffing in the department (Stormwater GIS Manager) brought a new focus, utilizing ArcGIS online data collection technology to improve workflows with existing high quality data. The City has chosen the ESRI mobile application, Collector, to perform inspections. Outfall and stormwater structure data has been loaded into the online map, along with additional infrastructure and background data. As the outfall, structure and stormwater infrastructure data has been gathered using survey grade standards, there is no need for utilizing specialized GPS equipment in gathering inspection data.

The dry weather flow web map, when accessed through the Collector app (as shown below), allows staff to collect relevant data while in the field, including photographs, using only a tablet or smart phone. The inspector is able to enter the data, including date and time, color, odor, turbidity and other relevant characteristics of the location into the preformatted database. The data are then uploaded to the City servers in real time, allowing office staff to see the data and develop reports without the need for cumbersome data transfer routines or post processing.



Due in part to the vacancy of the Stormwater GIS Manager position for part of the reporting period and a very wet spring season, there was a lag in the collection of data from investigations. However, the City completed the inspection of 3 separate, drainage segments from its identified list during the end of this reporting year and anticipates being able to accomplish one location/month during the next reporting year based on the efficiency of the new data collection procedures. Maps of the 3 locations and associated table are found in Appendix D.

d. Investigations into the source of all identified illicit discharges.	The permittee shall maintain, and evaluate annually written procedures for conducting investigations of identified illicit discharges.

Accomplishments:

The City has continued to utilize its Illicit Discharge Detection Elimination (IDDE) Policy and Procedures Manual document. The purpose of this document is to provide a standard for guidance and information for the effective and efficient implementation of the Illicit Discharge Detection and Elimination Program within the City of Wilmington. The document outlines the investigation, testing, coordination with other authorities, GIS inventory, follow up, and documentation procedures to be taken to resolve a questionable dry weather flow.

The City had its second full year of data input and documentation through *Intelligov*, our data management system. All details of incidences are reported are entered from the start of an incidence until the investigation until is closed. This documentation into *Intelligov* has allowed for the extraction of data for evaluation of our program, and assessment to identify repeat offenders and chronic violators as well as serve as help us identify areas of the City with higher violation reports. See Appendix I.

e. Track investigations and document illicit discharges	The permittee shall track all investigations and document the date(s) the illicit discharge was observed; the results of the investigation; any follow-up of the investigation; and the date the investigation was closed.

Accomplishments:
The City continues to address illicit discharges in the stormwater system and to protect public water under its Ordinance. This Ordinance change went into effect on November 1, 2009. The City continues to update the Illicit Discharge Detection Elimination (IDDE) Policy and Procedures manual as the program evolves. The purpose of this document is to provide standards for protocol, field guidance and information for the effective and efficient implementation of the Illicit Discharge Detection and Elimination (IDDE) Program. We continue to update as procedures change and become more efficient for data collection and reporting into the City's tracking database *Intelligov*.

The City has improved its procedures for collecting data for dry weather flow monitoring during this reporting period and will allow for more efficient field procedures and better documentation should an illicit discharge be observed.

f. Employee Training	The permittee shall implement and document a training program for appropriate municipal staff who as part of their normal job responsibilities, may come into contact with or otherwise observe an illicit discharge or illicit connection to the storm sewer system.

Accomplishments:
The City conducted training for the Engineering Department (Construction Inspectors) staff during this reporting year (September 2014). In addition, new employee training material and presentations have been discussed as part of an on-boarding process when new hires start in their respective positions with the City. Training material for these new employees is planned for implementation during the upcoming reporting period. Refresher training and education for existing staff will be updated as necessary and implemented every 1-2 years.

g. Provide Public Education	The permittee shall inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

Accomplishments:
Stormwater education and code enforcement staff continued an effort to educate restaurants within the Wilmington city limits and evaluate our public awareness and education efforts through an educational mailing and return survey. 2015 was the final year of these Restaurant surveys and educational mailings.

In all, surveys and materials were mailed to and received by 453 restaurants over the course of 3 years. Although the response rate was 10-11% each year, 2015 actually had the highest rate of returned surveys. The survey questions were aimed at gauging awareness and understanding of

stormwater and proper restaurant practices. The majority of respondents answered these questions correctly each year. With yearly response rates ranging from 90-95% for correct responses, this told us that the restaurant managers/owners understood where stormwater runoff drains to, how improper restaurant practices can pollute waterways, the city's stormwater ordinance as it pertains to restaurants, and whether or not they will implement new restaurant practices to protect water quality or are already using the proper practices. Interestingly, the majority of survey respondents reported that they were already implementing the proper practices, with a handful saying they would implement new practices. Overall, the high rate of correct responses indicate that our education and enforcement methods have been effective with this target audience.

Several significant signage projects were initiated and completed this year. These included development of a new Pet Waste Pilot Program that aims to educate the public and private sector through moveable educational signage in conjunction with code enforcement

h. Public reporting mechanism	The permittee shall promote, publicize, and facilitate a reporting mechanism for the public and staff to report illicit discharges and establish and implement citizen request response procedures.

Accomplishments:

The Stormwater Pollution Prevention hotline was established in January 2010 to field calls from citizens, businesses and employees to report illicit discharges and instances of potential or definitive stormwater pollution. The hotline phone # is 910-341-1020 and the web address is www.wilmingtonnc.gov/reportstormwaterpollution.

Hotline/web reports are routed to the Stormwater Code Compliance Officer who tracks, investigates, and responds to each hotline report. The hotline and online reporting webform are advertised on the City's cable TV channel and via the stormwater website, citywide newsletters, public presentations, large educational magnets on stormwater fleet vehicles, and promotional outreach items including pens, refrigerator magnets, and post-it notes giveaways to the public. To summarize hotline activity this past year: 6 calls placed to the City's Stormwater hotline, 1 online web form report was submitted, 22 emails and 13 calls were received by the Compliance Officer. The nature of the hotline reports are found in Appendix I.

i. Enforcement	The permittee shall implement a system to track the issuance of notices of violation and enforcement actions as administered by the permittee. The data maintained in this system shall enable permittee to identify chronic violators for initiation of actions to reduce noncompliance.

Accomplishments:

The City of Wilmington uses *Intelligov* data management system to track all requests for service. This includes illicit discharge reports from the public and from City staff. This system allows us to enter all relevant data from an investigation and then analyze, map, and track various aspects of the incident including enforcement actions and repeat offenders in order to identify chronic

violators. For year 2014-2015 there were no repeat offenders for Illicit Discharges. See Appendix I for enforcement actions summary for this reporting year.

Assessment of Program Implementation

The City continues to implement and enforce its IDDE program to address the detection and elimination of illicit discharges. The City has begun fully implementing its dry weather flow monitoring program. The City has improved its procedures for collecting data for dry weather flow monitoring during this reporting period. A focus of utilizing ArcGIS online data collection technology to improve workflows with existing high quality data was begun later in the reporting year. A dry weather flow monitoring schedule was used for the 2014/15 calendar year based on identified outfall locations and their associated trunk lines. This schedule will be updated with new locations moving in the next reporting period.

The City continues to utilize the existing ordinances in place to address illicit discharges to its system. To date, no changes to the ordinance have been necessary as it provides the adequate legal authority to prohibit illicit connections and discharges and enforce the approved IDDE Program at this time.

The City has documented its first second year of *Intelligov data*, our data management system. Improved reporting and documentation into *Intelligov* continues to allow for the extraction of data for evaluation of our program, and assessment to identify repeat offenders and chronic violators as well as serve as help us identify areas of the City with higher violation reports. No repeat offenders were identified for this year.

Public education regarding illicit discharges continues to be one of the major goals for the City. Staff worked in cooperation with Stormwater Code Enforcement to develop targeted educational and enforcement materials. Surveys and materials were mailed to local restaurants over the course of 3 years with yearly response rates ranging from 90-95% for correct responses. This indicates that the restaurant managers/owners understood where stormwater runoff drains to, how improper restaurant practices can pollute waterways, and how the city's stormwater ordinance pertains to restaurants.

Objectives for Next Year

- Update dry weather flow monitoring schedule as new locations are identified.
- Complete one drainage segment per month as identified on the dry weather flow schedule (as weather permits). Efforts will be concentrated in the impaired watersheds of Bradley Creek, Burnt Mill Creek and Greenfield Lake.
- Update or modify dry weather flow data collecting procedures as needed.
- Evaluate effectiveness of *Intelligov* reporting practices. Assess locations of offenders to determine repeat violations and make recommendations to address those sites.
- Determine effectiveness of public education efforts to restaurants by looking at frequency of violations in those areas.
- Implement training sessions for new employees regarding IDDE.
- Begin Inventory Mapping of areas identified around Greenfield Lake.

CONSTRUCTION SITE RUNOFF CONTROLS

The permittee relies on New Hanover County to comply with this minimum measure. The New Hanover County Sediment and Erosion Control Program effectively meets the requirements of the Construction Site Runoff Controls by permitting and controlling development activities disturbing one or more acres of land surface and those activities less than one acre that are part of a larger common plan of development. This program includes procedures for public input, sanctions to ensure compliance, requirements for construction site operators to implement appropriate erosion and sediment control practices, review of site plans which incorporates consideration of potential water quality impacts, and procedures for site inspection and enforcement of control measures.

New Hanover County Erosion Control Program information supplied in Appendix E.

POST CONSTRUCTION SITE RUNOFF CONTROLS

1. Objectives for Post-Construction Site Runoff Controls

a. Implement and enforce a program to address storm water runoff from new development and redevelopment projects that require a CAMA major development permit or a Sedimentation and Erosion Control Plan. The program shall ensure that controls are in place that would prevent or minimize water quality impacts.

b. Implement strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for the community;

c. Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects; and

d. Adequate long-term operation and maintenance of BMPs.

2. BMPs for Post-Construction Site Runoff Controls

The permittee shall implement the following BMPs to meet the objectives of the Post-Construction Stormwater Management Program. To the extent there is any conflict between this permit and the post-construction ordinances adopted by the permittee as approved by the N.C. Division of Water Quality, the post-construction ordinances shall apply with regard to permit compliance.

BMP	Measurable Goals
a. Adequate legal authorities	Maintain through an ordinance, or other regulatory mechanism, adequate legal authorities to meet the objectives of the Post-Construction Site Runoff Controls program. The permittee shall have the authority to review designs and proposals for new development and redevelopment to determine whether adequate stormwater control measures will be installed, implemented, and maintained. The permittee shall have the authority to request information such as stormwater plans, inspection reports, monitoring results, and other information deemed necessary to evaluate compliance with the Post-Construction Stormwater Management Program. The permittee shall have the authority to enter private property for the purpose of inspecting at reasonable times any facilities, equipment, practices, or operations related to stormwater discharges to determine whether there is compliance the Post-Construction Stormwater Management Program.

Accomplishments:
The City continues to utilize the Land Development Code that was amended and adopted on September 15, 2009 to provide post construction controls in order to meet the requirements of the City's Phase II permit and to bring the ordinance into compliance with the new Coastal Stormwater Legislation.

b. Strategies which include BMPs appropriate for the MS4	The permittee shall adopt the DWQ BMP Design Manual or certify that the local BMP Design Manual meets or exceeds the requirements in the DWQ BMP Design Manual.

Accomplishments:
The DWQ BMP manual was adopted when the stormwater ordinance was amended in 2009. This ordinance contains provisions addressing the use of combinations of structural and non-structural BMPs to manage stormwater runoff. Some examples of these include providing peak attenuation flow for the 2, 10 and 25 year storm event, requiring (new development) a 50 foot set back from surface waters, and stricter built-upon requirements for projects near SA waters.

c. Plan reviews	The permittee shall conduct site plan reviews of all new development and redeveloped sites that disturb greater than or equal to one acre (including sites that disturb less than one acre that are part of a larger common plan of development or sale). The site plan review shall address how the project applicant meets the performance standards and how the project will ensure long-term maintenance.

Accomplishments:
The City continues to conduct site plan reviews utilizing the City's Land Development Code in order to provide post construction controls to meet the requirements of the City's Phase II permit. A summary of the plan review activities for this reporting year is available in Appendix F.

d. Inventory of projects with post-construction structural stormwater control measures	The permittee shall maintain an inventory of projects with post-construction structural stormwater control measures installed and implemented at new development and redeveloped sites, including both public and private sector sites located within the permittee's corporate limits that are covered by its post-construction ordinance requirements.

Accomplishments:
The City's Plan Review Engineers continue to update a spreadsheet of projects with stormwater control measures installed during the reporting year. This spreadsheet includes the dates permits

were issued, review times for projects, types of projects (new development, redevelopment), and the types and numbers of BMPs per project location. This spreadsheet will continue to be used for future permits issued and evaluated or modified if data extraction is warranted.

e. City Code, Permitting Regulations, Easement, and/or Deed Restrictions and Protective Covenants	Ensure development activities will maintain the project consistent with approved plans.

Accomplishments:
Current City of Wilmington stormwater management ordinance stipulates among other requirements for stormwater management after construction that:

Record (as-built) drawings (reproducible mylar) for all stormwater management facilities certified by an authorized registered professional must be provided to the City for permanent record.

When deemed necessary by the City, an easement in a form approved by the City attorney, granting the City and its agents and representatives adequate and perpetual access to the facility and sufficient area for inspection and maintenance, if necessary, by the City, its agents and representatives. Said easement shall be filed in the New Hanover County Registry, at the expense of the applicant, and shall bind all subsequent owners and assigns of the facility and of the property on which the facility is located.

The following excerpt from the new stormwater ordinance became operational upon adoption City Council:

The approval of the stormwater permit shall require an enforceable restriction on property usage that runs with the land, such as recorded deed restrictions or protective covenants, to ensure that future development and redevelopment maintains the site consistent with the approved project plans.

Additionally, the new ordinance has provisions to ensure that conveyance of the property does not terminate the original developer's obligations until a replacement permit has been issued. The original developer will be required to record in the deed conveying the property a notice of the existence of any stormwater devices and the purchaser's obligations to maintain and inspect them and to obtain a permit. There are also specific and detailed special requirements for property owner associations regarding operation and maintenance of stormwater devices, escrowing funds to ensure maintenance and remedies for the City in the event of failed compliance.

f. Provide a mechanism to require long-term operation and maintenance of structural BMPs.	The permittee shall implement or require an operation and maintenance plan for the long-term operation of the structural BMPs required by the program.

Accomplishments:
The DWQ BMP manual was adopted when the stormwater ordinance was amended in 2009. This ordinance contains provisions addressing the use of combinations of structural and non-

structural BMPs to manage stormwater runoff. With this adoption, the City also reviews and approves the O&M requirements and plans of the State through the review process.

g. Inspections of Structural Stormwater Control Measures	To ensure that all stormwater control measures meet the permittee's performance standards and are being maintained pursuant to the maintenance agreement, the permittee shall develop and implement a written inspection program for structural stormwater controls installed pursuant to the permittee's post-construction program. The permittee shall document and maintain records of inspections, findings and enforcement actions and make them available for review by the permitting authority.

Accomplishments:

Under the current stormwater management ordinance of the City, permitees of structural BMPs are required to properly maintain their stormwater management systems to ensure long term operation. The City conducted biannual compliance inspections for privately owned stormwater BMPs in order to ensure maintenance responsibilities are being undertaken by property owners. Inspections were conducted by a City staff member who has completed the Stormwater BMP Inspection and Maintenance Certificate offered through NC State's Biological and Agricultural Engineering Department (certification #182). Recertification occurred in March 2013. An inspection summary is included in Appendix F. In addition, sample inspection reports are provided.

The City continues to review and update its manual for all O&M plans for known City owned and/or maintained BMPs under their respective NCDWQ stormwater permits. This manual provides access to BMP schedules for O&M and permit renewal dates.

h. Educational materials and training for developers	The permittee shall make available through paper or electronic means, ordinances, post-construction requirements, design standards checklist, and other materials appropriate for developers. New materials may be developed by the permittee, or the permittee may use materials adopted from other programs and adapted to the permittee's new development and redevelopment program.

Accomplishments:

Currently all ordinances, design standards, application forms, BMP Manual and Technical Standards for developers are found online at the City's website. The city provides instruction online for the forms so that developers can provide the necessary documentation for the process review.

i. Enforcement	The permittee shall track the issuance of notices of violation and enforcement actions as administered by the permittee. This mechanism shall include the ability to identify chronic violators for initiation of actions to reduce noncompliance.

Accomplishments:

The City has tracked the issuance of violations through its current inspection process since the implementation of the stormwater ordinance. The City made improvements in the inspection process and its associated database for private BMPs and will continue with updates in the next reporting year. The updated database will allow for improved documentation of City inspections.

Assessment of Program Implementation

The City has continued to maintain adequate legal authorities to meet the objectives of the Post-Construction Site Runoff Controls program through its Land Development Code. In addition, the City continues to conduct site plan reviews utilizing the City's Land Development Code in order to provide post construction controls to meet the requirements of the City's Phase II permit.

The City's Plan Review Engineers continue to their update their database in order to track projects with stormwater control measures installed. This spreadsheet provides relevant information regarding new development and redevelopment projects. This spreadsheet will continue to be used for future permits issued and evaluated or modified if data extraction is warranted.

Objectives for Next Year

- Review ordinances to determine if any changes are needed to improve the post-construction requirements.
- Continue to update and evaluate database of new or redeveloped projects to determine if information can be improved, if documentation is adequate, and if modification for data extraction is needed.
- Continue with second phase of BMP inspection database improvements for 2015/16. With the discussed planned improvements, the City should be able to look for trends in repeat offenders and address them through education and outreach of property owners.

3. Post-construction Stormwater Runoff Controls for New Development

a. In order to fulfill the post-construction minimum measure program requirement the permittee may use the Department's model ordinance, design its own post-construction practices that meet or exceed the Department's Stormwater Best Management Practices Manual on scientific and engineering standards, or develop its own comprehensive watershed plan that is determined by the Department to meet the post-construction stormwater management measure required by 40 Code of Federal Regulations§ 122.34(b)(5)(l July 2003 Edition).

b. The permittee shall meet the State's stormwater requirements for projects that are performed by, or under contract for, the permittee.

c. Adoption of the Universal Stormwater Management Program (USMP) meets the requirement to develop and implement a Post-Construction Program by the local government adopting an ordinance that complies with the requirements of l5A NCAC 02H .1020 and the requirements of 15A NCAC 02B .0104(f). Adoption of the USMP may not satisfy water quality requirements associated with the protection of threatened or endangered species or those requirements associated with a Total Maximum Daily Load (TMDL).

d. Compliance with the stormwater management and water quality protection promulgated in Rules 15A NCAC 2H .1000 and Session Law 2008-211 effectively meets the Post- construction Stormwater Runoff control requirements within the 20 coastal counties.

POLLUTION PREVENTION AND GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

1. Objective for Pollution Prevention and Good Housekeeping for Municipal Operations

a. Implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.

b. Provide employee training to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance.

2. BMPs for the Pollution Prevention and Good Housekeeping for Municipal Operations

The permittee shall implement the following BMPs to meet the objectives of the Pollution Prevention and Good Housekeeping Program.

BMP	Measurable Goals
a. Inventory of municipally owned or operated facilities	The permittee shall maintain a current inventory of facilities and operations owned and operated by the permittee with the potential for generating polluted stormwater runoff.

Accomplishments:

The City created an inventory of its known facilities with the potential for generating polluted runoff during the previous reporting year. Sites were identified by location, type of facility and potential pollution sources. Sites were evaluated to determine if further implementation of pollution prevention measures are necessary based on current on-site procedures and equipment. Site BMP recommendations were implemented at some of the locations this reporting year (for example, spill kits for sites with above ground storage tanks). Additional structural and non-structural BMP implementation will continue at the other identified locations.

The City currently has a Spill Prevention Control and Countermeasure plan (SPCC) for the Operations Complex and a separate Stormwater Pollution Prevention Plan (SPPP) for the Fleet Maintenance building located within the complex. A SPCC is also in place for the Police Headquarters location.

b. Operation and Maintenance (O&M) for municipally owned or operated facilities	The permittee shall maintain and implement, evaluate annually and update as necessary an Operation and Maintenance (O&M) program for municipally owned and operated facilities with the potential for generating polluted stormwater runoff. The O&M program shall specify the frequency of inspections and routine maintenance

	requirements.

Accomplishments:
Currently, The City relies on a SPCC plan and a SPPP for the Operations Complex and Fleet Maintenance building. These plans focus on the activities at Fleet Maintenance and also preventive inspections at the City's fueling islands, (2) 10,000g fuel tanks and the 6 generators on site. An additional SPCC for the Police Headquarters addresses inspections for their fueling island and backup generator as well. Analytical and qualitative monitoring of the outfall per the requirements of the SPPP and General Permit (NCG08000) for Fleet Maintenance indicate parameter levels well below benchmark values.

Staff training of site managers continued to take place this past reporting period to ensure that documentation of plans is occurring. Further training by facility managers to their respective staff included in the plan continues to be documented as well.

The City will include the recommendation plans for Parks and Recreation facilities and the Coleman Sweeper Complex in its annual reviews to ensure that BMPs are being implemented and sites are conducting good housekeeping practices.

The City recently updated the existing spill kits located at the Police Headquarters facility for the diesel above ground storage tank along with adding a new kit for the fueling island with appropriate identification markers.

c. Spill Response Procedures	The permittee shall have written spill response procedures for municipally- owned or operated facilities.

Accomplishments:
Spill Response procedures are identified in the City's SPCC plans for the Operations Complex and Police Headquarters and also in the SPPP for Fleet Maintenance. The City will continue to follow these plans and make any changes if necessary and also ensure documentation is occurring within the plans.

Preliminary planning has occurred between Stormwater staff and the new Public Services Safety Specialist to conduct spill control training for Fleet Maintenance staff and the Spill Response Team per the City's SPPP. This is tentatively planned for fall 2015.

d. Streets, roads, and public parking lots maintenance	The permittee shall evaluate BMPs to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots within the corporate limits. Within 12 months, the permittee must update its Stormwater Plan to include the BMPs selected.

Accomplishments:
The City currently utilizes BMPs that help reduce polluted stormwater runoff from streets, roads, and public parking lots within its jurisdictional area. Stormwater crews sweep City streets with curbing (on average) twice/month, NCDOT owned roads once/month, and City owned parking

lots from once/month to once/ quarter. City owned parking lots include City operations facilities, City Hall, parks locations, and recreation facilities.

In reporting year 2014/15, street sweepers swept 9,649.7 curb miles while collecting 3,114.1 tons of debris, sediment, vegetation and trash potentially diverted from the stormwater sewer system.

In fiscal year 2014/15, hand maintenance and vacuum trucks cleaned 91,476.0 linear feet of pipe and removed blockages and cleaned 14,168.0 drainage inlets and manholes while collecting 1588.7 tons of debris, sediment, vegetation and trash potentially diverted from being discharged into our receiving waters.

The City is a member of the Urban Stormwater Consortium of the Water Resources Research Institute of the University of North Carolina. This group is funding a research proposal to look at nutrient and carbon loading in gross solids in urban catch basins. Because gross solids in stormwater runoff are an un-quantified (or under quantified) source of nutrients to receiving waters, the study will partner with the City of Wilmington and three other NC municipalities to select four drain inlets with up to four land types represented per the study. Data collected will be analyzed for mass, volume, bulk density, total nitrogen, total phosphorus, total carbon, and composition of material.

The City also has begun looking into its procedures for the decanting of their vacuum trucks after pipe or structural maintenance/cleaning occurs. City owned, wet pond facilities have been identified at strategic locations throughout the City as potential decanting centers for maintenance crews while conducting their jobs in these regions. The goal is to help improve water quality issues that were identified during past decanting operations. The City will be finalizing formal procedures for this activity during the next reporting year.

e. Streets, roads, and public parking lots maintenance	Within 24 months, the permitee must implement BMPs selected to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots.

Accomplishments:
See above 2.(d).

f. Operation and Maintenance (O&M) for municipally - owned or maintained catch basins and conveyance systems	Within 12 months, the permittee shall develop and implement an O&M program for the stormwater sewer system including catch basins and conveyance systems that it owns and maintains.

Accomplishments:
The City currently has a program for the operation and maintenance of all City owned structural BMPs, storm sewer system, and street sweeping. This program includes repair, inspection and maintenance of all City owned right of ways and officially accepted easements. This information was previously included in this report under *Operations/Maintenance – Yearly Maintenance Activities Table* on page 12.

The City also keeps and updates a BMP Manual for all of its City owned BMPs. The manual includes all associated State DWQ stormwater permits, O&M plans, and site mapping in order to review maintenance requirements and permit renewal dates along with any additional documentation that might be needed. This manual provides information that can be readily reviewed by maintenance crews in order to keep the BMPs in compliance.

g. Identify structural stormwater controls	The permittee shall maintain a current inventory of municipally-owned or operated structural stormwater controls installed for compliance with the permittee's post-construction ordinance.

Accomplishments:

The City keeps and updates a BMP Manual for all of its City owned BMPs. The manual includes all associated State DWQ stormwater permits, O&M plans, and site mapping in order to review maintenance requirements and permit renewal dates along with any additional documentation that might be needed. This manual provides information that can be readily reviewed by maintenance crews in order to keep the BMPs in compliance.

h. O&M for municipally-owned or maintained structural stormwater controls	The permittee shall maintain and implement an O&M program for municipally-owned or maintained structural stormwater controls installed for compliance with the permittee's post-construction ordinance. The O&M program shall specify the frequency of inspections and routine maintenance requirements. The permittee shall inspect and maintain municipally-owned or maintained structural stormwater controls in accordance with the schedule developed by permittee. The permittee shall document inspections and maintenance of all municipally-owned or maintained structural stormwater controls.

Accomplishments:

The City keeps and updates a BMP Manual for all its City owned BMPs. The manual includes all associated State DWQ stormwater permits, O&M plans, and site mapping in order to review maintenance requirements and permit renewal dates along with any additional documentation that might be needed. This manual provides information that can be readily reviewed by maintenance crews in order to keep the BMPs in compliance. Documentation occurs with every BMP site visit and maintenance activity.

i. Pesticide, Herbicide and Fertilizer Application Management.	The permittee shall ensure municipal employees and contractors are properly trained and all permits, certifications, and other measures for applicators are followed.

Accomplishments:
The City has compiled all pesticide, herbicide and fertilizer application certifications for its Parks and Recreation and Stormwater personnel to ensure that they are current. These certifications are updated and renewed annually. Currently, there are 20 certifications for Parks and Recreation staff and 2 certifications for Stormwater staff.

j. Staff training	The permittee shall implement an employee training program for employees involved in implementing pollution prevention and good housekeeping practices.

Accomplishments:
The City documents staff training for site supervisors involved with the SPCC and SPPP. Sites are reviewed at scheduled times during the reporting period to ensure that implemented BMPs are working and being utilized and that staff is documenting their respective plans as necessary.

A planned, outsourced spill response training course that was scheduled for Fleet Maintenance staff was to have occurred during this past reporting year but had to be postponed again due to schedule conflicts. Therefore, in order to meet staff training requirements per the City's SPPP, preliminary planning has occurred between Stormwater staff and the new Public Services Safety Specialist to conduct spill control training for Fleet Maintenance staff and the Spill Response Team per the City's SPPP and SPCC plan. In addition, the Good Housekeeping/Pollution Prevention training for Fleet Maintenance staff is proposed for the fall 2015 as well to correspond around the spill response training.

The City has also begun evaluating other departments (Parks and Rec., Streets, Stormwater and Fleet) that could benefit from training for better BMP management and training while conducting their everyday maintenance activities. This would involve possibly shadowing staff to see where improvements can be made regarding water quality while out in the field. A formal schedule and plan is currently being created with finalization scheduled for the end of the 2015 year. A supervisor training record for Fleet Maintenance is found in Appendix G.

k. Prevent or Minimize Contamination of Stormwater Runoff from all areas used for Vehicle and Equipment Cleaning	The permittee shall describe and implement measures to prevent or minimize contamination of stormwater runoff from all areas used for vehicle and equipment cleaning.

Accomplishments:
Maintenance and cleaning conducted at the City's Operations Complex continues to occur at a wash down station, located at the Solid Waste facility, equipped with an oil/water separator that accepts wash water and directs it to the sanitary sewer.

Stormwater staff, along with the Fleet Maintenance Manager, has begun to evaluate the need for annual maintenance of the interior trench drains located along the perimeter of the garage facility. Although no vehicle or equipment cleaning occurs at this location, sediment and grit accumulates in the trench drains from the everyday maintenance of vehicles being pulled in and out of the

building along with wind swept debris during the warmer months when the high bay doors are kept open. Stormwater staff is currently scheduling an annual cleaning of this interior drainage system to help minimize buildup and will start documenting the procedure. In addition, staff is working with the Buildings Manager to help document the inspections of oil/water separators and the Operations Complex and Fire Headquarters.

Small engine repair (line trimmers, blowers, chain saws, compacters, etc.) and cleaning for various City activities occurs in individual departments maintenance garages. In the event of an accidental discharge, the garages have drains located within the floor that connect to an oil water separator located on each site within the Operations Complex.

Assessment of Program Implementation
The City was successful in implementing its SPCC and SPPP for designated City owned facilities with the potential to pollute receiving waters. Site BMPs continue to be implemented and documentation has been addressed with building supervisors.

The City was also successful in implementing BMPs at other City facilities identified with the potential to pollute based on the type of activities that occur there.

Procedures for improving water quality from the decanting of vacuum trucks has begun to be discussed and implemented.

Planning is occurring for the improved documentation of inspections for the City's oil/water separators.

The City reviewed and compiled current herbicide, pesticide and fertilizer licenses to determine if personnel are current in their training.

Objectives for Next Year

- The City will continue to follow up on the recommendation plans for sites with the potential to pollute. The City will implement the BMPs suggested in the recommendation plans.
- Document oil/water separator inspections for City facilities.
- Conduct spill control training for appropriate employees per SPPP and SPCC plan.
- Begin implementing pollution prevention and water quality improvement recommendations for field maintenance activities for stormwater, parks and recreation and other City personnel.
- Finalize vacuum truck decanting procedures and start implementing.
- Ensure documentation for SPCC and SPPP are being completed for various site locations.

TOTAL MAXIMUM DAILY LOADS (TMDLs)

1. Objective

a. Determine whether a TMDL has been developed and approved or established by EPA for the receiving water(s) of the MS4 stormwater discharge and/or downstream waters into which the receiving water directly flows.

b. Develop and implement BMPs to reduce non-point source pollutant loading to the maximum extent practicable (MEP) if the permittee is or becomes subject to an approved TMDL with an approved Waste Load Allocation (WLAs) assigned to stormwater.

c. If subject to an approved TMDL, the permittee is in compliance with the TMDL if the permittee complies with the conditions of this permit, including developing and implementing appropriate BMPs to reduce non-point source pollutant loading to the maximum extent practicable (MEP). While improved water quality is the expected outcome, the NPDES MS4 permit obligation is to reduce non-point source pollutant loading to the maximum extent practicable (MEP). The MS4 permittee is not responsible for attaining water quality standards (WQS) at the ambient monitoring stations. The Division expects attaining WQS will only be achieved through reduction from the MS4, along with reductions from other nonpoint source contributors.

2. Best Management Practices (BMPs)

At any time during the effective dates of this permit, if the permittee is or becomes subject to an approved TMDL with an approved Waste Load Allocation (WLAs) assigned to stormwater, the permittee shall implement the following BMPs to reduce non-point source pollutant loading to the maximum extent practicable (MEP):

BMP	Measurable Goals
a. Identify, describe and map watershed, outfalls, and streams	Within 12 months the permittee shall prepare a plan that: • Identifies the watershed(s) subject to an approved TMDL with an approved Waste Load Allocation (WLAs) assigned to stormwater, • Includes a description of the watershed(s), • Includes a map of watershed(s) showing streams & outfalls • Identifies the locations of currently known major outfalls within its corporate limits with the potential of contributing to the cause(s) of the impairment to the impaired segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments and • Includes a schedule to discover and locate other major outfalls within its corporate limits that may be

BMP	Measurable Goals
	contributing to the cause of the impairment to the impaired stream segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments.

b. Existing measures	Within 24 months the permittee's plan: • Shall describe existing measures being implemented by the permittee to enhance water quality in the watershed to which the TMDL applies; and • Provide an explanation as to how those measures are designed to enhance water quality.

c. Assessment of available monitoring data	Within 24 months the permittee's plan shall include an assessment of available monitoring data. Where long-term data is available, this assessment should include an analysis of the data to show trends.

d. Monitoring Plan	Within 36 months the permittee shall develop and submit to the Division a Monitoring Plan for each pollutant of concern or cause of impairment as specified in the TMDL. The permittee shall maintain and implement the Monitoring Plan as additional outfalls are identified and as accumulating data may suggest. Following any review and comment by the Division the permittee shall incorporate any necessary changes to monitoring plan and initiate the plan within 6 months. Modifications to the monitoring plan shall be approved by the Division. Upon request, the requirement to develop a Monitoring Plan may be waived by the Division if the existing and proposed measures are determined to be adequate to enhance water quality and reduce non-point source pollutant loading to the maximum extent practicable (MEP).

e. Additional Measures	Within 36 months the permittee's plan: • Shall describe additional measures to be implemented by the permittee to enhance water quality in the watershed to which the TMDL applies; and • Provide an explanation as to how those measures are designed to enhance water quality.

f. Implementation Plan	Within 48 months the permittee's plan shall: • Describe the measures to be implemented within the remainder of the permit term to enhance water quality in the watershed to which the TMDL applies and • Identify a schedule for completing the activities.

g. Incremental Success	The permittee's plan must outline ways to track and report successes designed to reduce non-point source pollutant loading to MEP. Successes could include increased inspections, expanded and/or tailored BMPs within the scope of the six minimum measures, structural and non-structural BMP installed and/or implemented, including retrofits, and strategies developed and implemented for development and redevelopment that include green infrastructure and LID practices.

h. Reporting	The permittee shall conduct an annual assessment of the program to enhance water quality in the watershed to which the TMDL applies and submit a report of the assessment to the Division. Any monitoring data and information generated from the previous year are to be submitted with each annual report.

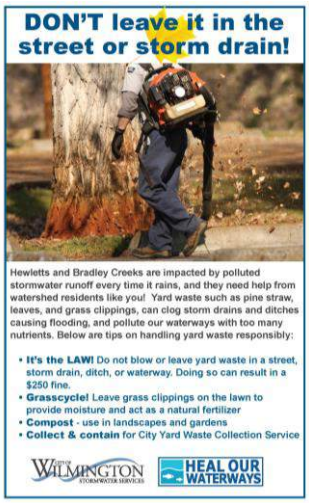
3. If no stormwater waste load allocation is specified in the TMDL

If there was no stormwater waste load allocation in the TMDL, in lieu of developing a Water Quality Recovery Plan, the permittee shall evaluate strategies and tailor and/or expand BMPs within the scope of the six minimum measures to enhance water quality recovery strategies in the watershed(s) to which the TMDL applies. The permittee shall describe the strategies and tailored and/or expanded BMPs in their Stormwater Management Plan and annual reports.

4. Watershed Restoration Plan approved by the Division

Voluntary implementation of a Watershed Restoration Plan approved by the Division constitutes compliance with this requirement and will allow deferment of TMDL development if tracking and monitoring are provided that demonstrate progress in implementing stormwater BMPs and/or enhancing water quality.

Bradley & Hewletts Creek Watershed Restoration Plan Accomplishments:



The Bradley and Hewletts Creek Watershed Restoration Plan, known as the Heal Our Waterways (HOW) program, continued to engage in education and outreach efforts and install volume-reduction best management practices (BMP) in both watersheds. The new contractual partnership with New Hanover Soil & Water Conservation District, which gave them dedicated funding for the execution of BMPs from start to finish, proved extremely beneficial and resulted in 7 rain gardens being installed on residential properties in the watersheds.

This past year, two educational postcards were mailed to 16,500 residents and commercial addresses in the watersheds and adjacent areas draining directly to the Intracoastal Waterway. This fall postcard focused on yard waste as a pollutant in our waterways. The spring postcard focused on fertilizer and the impact of nutrient pollution on waterways. The fall and spring postcards are part of a series aimed at educating residents on how to become better stewards of stormwater runoff. The postcards will eventually highlight BMPs that property owners can install to reduce stormwater runoff volume.

Digital billboard ads were run in the spring on two billboards in the Hewletts Creek Watershed. The ad featured fertilizer in order to make watershed residents aware of this local water quality pollutant. In addition, a wholly digital and mobile marketing campaign was run with WECT-TV6 this spring. The campaign featured 30,000 monthly expandable video ads, 15,000 monthly skyscraper ads, 50,000 monthly mobile ads, and 3,000 monthly video pre/post-roll ads. Finally, a shellfish closure ad was run in Wrightsville Beach Magazine for 3 months.

Presentations were given to university classes, Cape Fear River Watch, a Rainwater Harvesting class, as well as participation in several industry conferences including the NC Oyster Summit, and LID Conference. Promotional items and program materials were distributed at these classes and events.

In August 2014, a 319(h) grant funded proposal including the installation of 5 BMP projects in the Hewletts Creek Watershed was accepted and funded. NCSU and Heal Our Waterways will collaborate on the installation of these BMPs.

This June 2015, a wetland was constructed in a city easement in the Raintree Neighborhood. This project turned a previously piped channel into a wetland with ample volume storage. It also helped to reduce flooding issues for nearby homes in the neighborhood. The wetland has a surface area of 1168 sq ft. x 2.5 storage depth to equal 2,628 cubic feet of volume stored.

Of note, it was originally intended that the Heal Our Waterways program would use the Raintree neighborhood as a testing ground for education materials and outreach efforts and to collect feedback from residents. This effort never really got off the ground, so there was no real data to analyze and apply to future outreach campaigns in order to maximize the efficacy of the HOW message.

Because volume reduction is the metric for the watershed restoration project, quantification and tracking are of the upmost importance. BMP volume reduction projects that are in design or in the ground were tracked and quantified in the GIS Atlas, or Creek Counter, during the initial year of the HOW Program. However, after utilizing the current GIS Atlas, it was realized that the program would be better served to develop a GIS Atlas in house. This is currently in development and will enable staff to more accurately pinpoint projects and attributes and enable future communication with the property owners who installed BMPs.

This year, New Hanover Soil & Water Conservation District was granted a contract (HOWBMP) with the city to install BMPs on private properties in the watersheds. This past year, they completed 7 rain gardens on residential properties. Yard signs were designed and printed to be awarded to those who participate in the program. Word of mouth by neighbors has resulted in the installation of 2 additional rain gardens. More neighbors are now interested in this project in both watersheds.

Annual Assessment & Evaluation of Plan Implementation:

This past year, the HOW program made progress toward its goals including the installation of a wetland on a city easement in the Raintree Neighborhood and 7 residential rain gardens. Moving forward, the program has recognized that there is a great need to focus on private property BMP installations.

As evidenced by the progress that New Hanover Soil & Water Conservation has made under contract with HOW, including 7 rain gardens installed at residences, there are ample opportunities to work with individual property owners to install BMPs on both residential and commercial property throughout the watersheds. Word of mouth and neighborhood interest is beginning to take off, despite not having rolled out the HOW program watershed-wide just yet.

The information below includes the progress towards the plan's 6 Objectives and 35 Actions this past year:

Objective 1: Continue existing programs that address water quality impairments in both watersheds:

The City has continued its environmental education and outreach efforts through direct mailings to watershed residents and public event participation, as well as the Enviroscape program which is

presented in every 8th grade classroom in New Hanover County.

In addition, both the city and the county are still currently developing comprehensive plans for future growth and development; New Hanover County.

Objective 2: Determine appropriate water quality classifications and designated uses where water quality impairment exists:

In accordance with Action 2-1 the University of North Carolina at Wilmington (UNCW) continues to do regular surface water sampling to determine what effects the program's volume reduction efforts are having on the health of the creeks.

Plan Objective 2 concentrates heavily on the classification of local waters and how appropriate current classifications are under modern conditions. Ongoing issues regarding the proper classification of some waters and the possibility of a reassessment of those classifications and their criteria by the State of North Carolina have delayed staff in addressing this objective in the last year. The timeline for this objective will depend largely on when, and if, an overhaul of the classification takes place. Objective 2 is not necessarily time sensitive and may therefore be readdressed in years 3 and 4 when the restoration plan has gained enough recognition to perpetuate its own momentum. At that point it may be more in the interest of the plan to focus on reclassification efforts, if necessary.

Objective 3: Reduce the transport of bacteria from land to water by reducing and tracking volume reduction:

The HOW Program has secured 319 grant funding for BMP installations in the Hewletts Creek Watershed, however the Bradley Creek Watershed was not well represented in grants.

The difference in funding is one of logistics. Hewletts Creek is classified as SA waters but, it does not currently meet the standards for use and is therefore officially impaired. This impairment status qualifies Hewletts Creek for a myriad of grants that concentrate on the restoration of impaired waters. Bradley Creek is classified as SC and therefore has no bacteriological standard for use. Though not clean, the creek is not technically 'impaired' and therefore not eligible for the same funding opportunities. Going forward, the efforts in Bradley will need to concentrate on residential and commercial BMP installations that are funded fully, or in large part, by the property owner or HOWBMP program.

Objective 4: Promote stormwater reduction efforts:

In accordance with Action 4-10, Stormwater Services installed a constructed wetland in the Raintree Neighborhood. This project in a city easement, enabled a total volume reduction of 2628 cubic ft.

There are additional actions under Objective 4 that will require attention in the future. For example, Action 4-4 calls for the promotion of tree plantings and Action 4-11 calls for evaluating existing pods for volume reduction potential. The HOW program will also work to promote stormwater reduction measures on City streets in future capital improvement projects.

Objective 5: Form and maintain partnerships:

The HOW program initiated a new contract (HOWBMP) with New Hanover Soil and Water Conservation District this past year to conduct project management for BMP installations in Hewletts and Bradley Creek Watersheds. This partnership was highly successful and resulted in the installation of 7 residential rain gardens in both Hewletts and Bradley Creek Watersheds.

Word of mouth from residents that have installed BMPs as part of HOWBMP is already garnering interest from several neighbors interested in the program. Going forward, these "early adopters" of BMPs will be our advocates in encouraging fellow residents to help protect the creeks by incorporating BMPs on their property.

Objective 6: Measure success and adapt plan based upon results:

There are many ways to measure success for this program, not the least of which is through volume reduction recorded in the GIS Atlas. However, since the GIS Atlas is currently being reconstructed from within the city, this measure has not been maintained in the past year. We do have records of each BMP in a binder, which will be re-entered once our internal GIS Atlas is up and running.

The City recognized the limitations of the contracted GIS Atlas for entering volume reduction projects. The functionality and reporting was limiting our efforts to communicate with residents that installed BMPs and overall the atlas was not very easy to use. The city decided to recreate the GIS Atlas in house and include all the parameters and functionality that will allow a robust tracking device for volume reduction projects throughout the watersheds.

There are 16,500 watershed residents who are potential participants in this program, and the HOW staff intends to make reach out to residents on a targeted audience basis to educate them about the problem of stormwater pollution and encourage behavior changes that result in volume-reduction BMP installations.

5. Information regarding North Carolina TMDLs

Information regarding North Carolina TMDLs is available at:
http://portal.ncdenr.org/web/wq/ps/mtu/trndlltmdls

APPENDICES

APPENDIX A: PROGRAM IMPLEMENTATION INCLUDING MODIFICATIONS AND JUSTIFICATION

None for this reporting period.

APPENDIX B: PUBLIC EDUCATION AND OUTREACH

Included in this section:

- BMP Reporting Table
- Public Outreach, Education and Involvement Plan including program goals, description of target pollutants, sources, and target audiences

DATE OF EVENT/ ACTIVITY	EVENT/ACTIVITY	AUDIENCE	DELIVERED BY (AGENCY)	METHOD OF DELIVERY / MESSAGE	ATTENDANCE/ PARTICIPATION

BMP a. Define outreach/education program goals including a description of the target pollutants, sources, and target audiences

Outreach and education program goals, as well as a description of the target pollutants, sources, and target audiences, why they were selected and key outreach messages are thoroughly identified in the Appendix. This section is updated as necessary to reflect changes in target audience characteristics, awareness, etc.

BMP b. Distribute public education materials and information to identified target audiences and user groups. For example, schools, homeowners, and/or businesses.

In addition to public outreach efforts in this category, the Stormwater Compliance Officer also distributes education materials to the public and targeted user groups (i.e. pet owners, auto shops, restaurants, residents, etc) and issues NOVs and fines to citizens and businesses that have been identified as non-compliant with the City's stormwater codes. Information about code enforcement actions are included in the Appendix.

Ongoing	8th Grade Enviroscape Watershed Presentations	All 8th Grade NHC Schools Science Classes	Stormwater Services CFRW NHSWCD	Classroom presentation about watersheds, water quality, nonpoint source pollution, BMPs and stewardship	74 classes 2200 students
10/23/2014	Presentation: UNCW Environmental Policy class	Undergraduate students	Stormwater Services	Enviroscape demonstration, policy constraints, educational giveaways - newsletters, zip wallets, water bottles	30 students
10/25/2014	Canines for Clean Water booth at New Hanover County Rabies Clinic	Pet owners	Stormwater Services	Canines for Clean Water booth - interactive event where pet owners sign a pledge to clean up after their pet and submit a photo of their pet to be featured on our website wilmingtonnc.gov/canines	80 pet owners signed the pledge and received dog bandana, treats, and pet waste literature. Dogs have a chance to be featured on city website
11/21/2015	Presentation: UNCW Environmental Graduate Class	Graduate students	Stormwater Services	Overview of Stormwater Services program Q&A Session	25 students 4 faculty members
1/5/2015	Direct mailing to Restaurants in Wilmington city limits (Year 3 of mailing and survey)	Wilmington Restaurants	Stormwater Services	Mailed code enforcement letter, restaurant education poster, and return mail survey	Year 3 (final year) of the education effort resulted in a 90% correct response rate
3/21/2015	Presentation: UNCW Environmental Policy class	Undergraduate students	Stormwater Services	Enviroscape demonstration, policy constraints, educational giveaways - newsletters, zip wallets, water bottles	32 students

3/21/2015	Canines for Clean Water booth at New Hanover County Rabies Clinic	Pet owners	NHSWCD	Canines for Clean Water booth - interactive event where pet owners sign a pledge to clean up after their pet and submit a photo of their pet to be featured on our website wilmingtonnc.gov/canines	50 pet owners signed the pledge and received dog bandana, treats, and pet waste literature. Dogs have a chance to be featured on city website
4/15/2015	Pet Waste Signage Pilot Program	Pet owners	Stormwater Services	Deployed new educational pet waste signage to place in city easements where pet owners walk their dogs	25 signs created
4/18/2015	Pawz in the Park at Battleship Park	Pet owners	NHSWCD	Canines for Clean Water booth - interactive event where pet owners sign a pledge to clean up after their pet and submit a photo of their pet to be featured on our website wilmingtonnc.gov/canines	45 pet owners signed pledge and received dog bandana, treats, and pet waste literature. Dogs have a chance to be featured on city website
4/25/15	Lower Cape Fear Earth Day Celebration at Hugh MacRae Park	Festival attendees, general public	Stormwater Services (SWS is an annual sponsor of Lower Cape Fear Earth Day Festival)	Display booth to promote stormwater pollution education with an interactive game/quiz and stormwater prizes	5,000+ attendees

BMP c. Informational Web Site (www.wilmingtonnc.gov/stormwater)					
Ongoing/ Regular Updates	Stormwater Services website	General public, website viewers	Stormwater Services	Dedicated stormwater website	Updates to the Stormwater website are ongoing. The site is regularly updated with fresh content including current projects, PSAs, news, upcoming events, education publications, videos, printed material, etc.
Ongoing	Stormwater Hotline info advertised on City website homepage and Facebook page	General public	Stormwater Services Communications Div.	Stormwater hotline and web reporting form for public; posted on website under What's New section and on City's Facebook page	Stormwater website, city website, Facebook fans, general public
8/4/2014	City of Wilmington website homepage and Facebook news	General public Web Viewers	Communications Div.	News article - Handling the rain	City of Wilmington Website viewers and Facebook fans
9/30/2014	City of Wilmington website homepage and Facebook news	General public Web Viewers	Communications Div.	News article - S. Bradley Creek/Michelle Dr. drainage project begins	City of Wilmington Website viewers and Facebook fans
10/27/2014	City of Wilmington website homepage and Facebook news	General public Web Viewers	Communications Div.	News article - Fall newsletter includes stormwater project update	City of Wilmington Website viewers and Facebook fans
12/1/2015	Capital Projects webpage	General public Web Viewers	Stormwater Services	Dedicated stormwater capital projects webpage	Significant updates to this page were conducted. New projects, maps, and info were included in the update.
1/23/2015	City of Wilmington website homepage and Facebook news	General public Web Viewers	Communications Div.	News article - Inland Greens update	City of Wilmington Website viewers and Facebook fans

4/17/2015	City of Wilmington website homepage and Facebook news	General public Web Viewers	Communications Div.	News article - Portion of Andover Dr. closed	City of Wilmington Website viewers and Facebook fans
4/24/2015	City of Wilmington website homepage and Facebook news	General public Web Viewers	Communications Div.	News article - Earth Day Festival	City of Wilmington Website viewers and Facebook fans
6/5/2015	City of Wilmington website homepage and Facebook news	General public Web Viewers	Communications Div.	News article - Spring newsletter and stormwater watch report	City of Wilmington Website viewers and Facebook fans
6/11/2015	City of Wilmington website homepage and Facebook news	General public Web Viewers	Communications Div.	News article - Stormwater drainage improvement projects	City of Wilmington Website viewers and Facebook fans
6/11/2015	City of Wilmington website homepage and Facebook news	General public Web Viewers	Communications Div.	News article - Lincoln Forest stormwater project nearing completion	City of Wilmington Website viewers and Facebook fans

BMP d. Maintain Hotline/Help line

The Stormwater Pollution Prevention Hotline was established in January 2010 to field calls from the citizens, businesses, and city employees regarding illicit discharges and other reports of stormwater pollution. The hotline phone # is **910-341-1020** and the web address is **www.wilmingtonnc.gov/reportstormwaterpollution.** Hotline/web reports are routed to the Stormwater Code Compliance Officer who tracks, investigates, and responds to all hotline reports. Information regarding hotline reports is included in the Enforcement Appendix section including the number and nature of hotline phone/web reports.

Ongoing	Stormwater Hotline advertised using various outreach methods: truck magnets, signs, billboards, presentations, etc.	General public	Stormwater Services	Hotline poster, website, GTV-8 and promo items (pens, magnets, sticky notes) are used to raise awareness of the Stormwater Hotline	Distribution varies based on method or event used

BMP e. Extent of Exposure/Reporting Requirements

Media Advertising Campaigns

September - November 2014	Mass Media - WECT-6 TV and website campaign (including Top Story wrap on website)	General public TV and web viewers	Stormwater Services	30 second stormwater PSA on TV (69 spots total) - WECT.com video pre-roll ads (3500 per month) - Campaign included production of new Yard Waste PSA	Target Audience: General public, males TV Reach: 74% for viewers age 35-64 TV Frequency: 2.4 WECT.com Web Reach: 250,000 unique visitors per month 1.9 million average page views per month Total cost: $4500
December 2014 - January 2015	Fairway Outdoor Billboard Advertising	Motorists Pedestrians	Stormwater Services	What Goes in Here, Ends up Here billboard	Target Audience: General public Reach: Motorists Frequency: Rotating - shown for 8 seconds every minute 24/7 Total cost: $1650

March - May 2015	Mass Media - WECT-6 TV and website campaign (including Top Story wrap on website)	General public TV and web viewers	Stormwater Services	30 second stormwater PSA on TV (69 spots total) - WECT.com video pre-roll ads (3500 per month) - Campaign included production of new Yard Waste PSA	Target Audience: General public, males TV Reach: 84.3% for viewers age 35-64 TV Frequency: 4.4 WECT.com Web Reach: 250,000 unique visitors per month 1.9 million average page views per month Total cost: $4500
April - May 2015	Mass Media - Cumulus Radio Broadcasting - WKXS 94.5 (The Hawk) and Blinks campaign	General public	Stormwater Services	:30 second PSAs on broadcast radio stations -Pet Waste PSA 1296 ads total with PSAs and blinks combined	Target Audience: Pet owners, General public Reach: 67,507 adults Frequency: 5.0 times Total cost: $4200
Spring 2015	Going Green Magazine-Stormwater Ad	General public Adults	Stormwater Services	Print and digital online magazine article - Wilmington Watershed Map	Target Audience: Adults/general public, Environmental groups Reach & Frequency: 8000 printed, also available online Total cost: Free
March - May 2015	Mass Media - WECT-6 TV and website campaign (including Top Story wrap on website)	General public Males/Females 25-64	Stormwater Services	:30 second stormwater PSA - Pet Waste (2014) PSA 93 spots total -Digital Marketing Campaign including video pre-roll, top story wraps 3500 ads total	Target Audience: General public, males TV Reach: 82% for viewers age 25-64 TV Frequency: 4.4 WECT.com Web Reach: 250,000 unique visitors per month 1.9 million average page views per month Total cost: $4500

May 2015	Fairway Outdoor Billboard Advertising	Motorists Pedestrians	Stormwater Services	Pet waste billboard	Target Audience: General public Reach: Motorists Frequency: Rotating - shown for 8 seconds every minute 24/7 Total cost: $1650
Cumulus Media is no longer purchasing Arbitron or Nielson ratings systems. This is a cost-cutting measure on their part, but it means they no longer have the ability to provide us with reach and frequency data for the campaigns I run on their stations. The data provided references prior years available reach and frequency data for these stormwater outreach campaigns. Approved per M. Randall, NC DWQ.					

News Coverage

8/12/2014	Star News editorial	Newspaper and online readers	Star News editor	Print and online newspaper editorial - Recent rains a reminder of importance of drainage, protecting tidal creeks	Stats: -Daily print newspaper and online website -94,492 print readers -628,086 monthly unique visitors to online website

Fall 2014	UNCW Magazine	General public Adults	Stormwater Services	Print and digital online magazine article- Trash Talk, an article about the UNCW class we speak with each semester	Direct mailing to university alumni, donators, and parents of attendees
Fall 2014	Animal Tales	General public Adults	New Hanover County Animal Services Unit	Article that mentions the City's pet waste ordinance	Pet owners and people who adopt from the shelter
9/3/2014	Lumina News article	Newspaper and online readers	Lumina News reporter	Print and online newspaper article- Rain gardens crop up around town	Stats: -Weekly print newspaper and online website -6,345 print readers/wk -6,700 weekly online readers
9/24/2014	WECT-TV6 news story	Station viewers	WECT reporter	TV news coverage - Officials search for gas leak on Wrightsville Ave	Stats: -WECT-TV6 reaches 176,000 homes/per wk -WECT.com has 250,000 average unique visitors per month and 1,200,000 average page views per month
9/25/2014	Lumina News article	Newspaper and online readers	Lumina News reporter	Print and online newspaper article- Cistern installation planned for workshop	Stats: -Weekly print newspaper and online website -6,345 print readers/wk -6,700 weekly online readers
1/1/2015	City of Wilmington Public Services newsletter	Newspaper and online readers	Public Services employees	Print and online newspaper article- On display: Bioretention cell	Stats: Newsletter is internally delivered to all Public Services employees
2/27/2015	WECT-TV6 news story	Station viewers	WECT reporter	TV news coverage- City of Wilmington releases schedule of stormwater improvement projects	Stats: -WECT-TV6 reaches 176,000 homes/per wk -WECT.com has 250,000 average unique visitors per month and 1,200,000 average page views per month
Spring 2015	UNCW Magazine	General public Adults	Stormwater Services	Print and digital online magazine article - Revitalizing the Community - Tidal Creek Rain Garden	Direct mailing to university alumni, donators, and parents of attendees

6/10/2015	WECT-TV6 news story	Station viewers	WECT reporter	TV news coverage- Experts working to combat pollutants in stormwater runoff	Stats: -WECT-TV6 reaches 176,000 homes/per wk -WECT.com has 250,000 average unique visitors per month and 1,200,000 average page views per month

Distributing promos/giveaways

Ongoing	Public Meetings, events, displays, city buildings	General public	Stormwater Services	Distribute items or leave in strategic locations where citizens will pick them up	Spread stormwater messages via freebies/promos at events such as Earth Day, Canines for Clean Water, etc.
Ongoing	Canines for Clean Water program at community pet events (ie Rabies Clinics, Pawz in the Park, etc)	Pet owners	Stormwater Services NHSWCD	Pet owners sign a pledge to clean up after their pet and submit a photo of their pet to be featured on our website wilmingtonnc.gov/canines	Goodie bag includes Canines for Clean Water pet bandana, pet waste pick up bags, pet waste brochure, pens, notepads
10/23/2014	Presentation: UNCW Environmental Policy class	Undergraduate students	Stormwater Services	Stormwater educational giveaways - brochures, zip wallets, tote bags, watershed posters	30 students
2/19/2015	Lower Cape Fear Stewardship Awards Program	Developers Realtors Environmental agencies	Stormwater Services	Stormwater educational giveaways - brochures, zip wallets, tote bags, watershed posters	150 attendees
3/21/2015	Presentation: UNCW Environmental Policy class	Undergraduate students	Stormwater Services	Enviroscape demonstration, policy constraints, educational giveaways - newsletters, zip wallets, water bottles, watershed posters	32 students
4/25/15	Lower Cape Fear Earth Day Celebration at Hugh MacRae Park	Festival attendees, general public	Stormwater Services (SWS is an annual sponsor of Earth Day)	Display booth, interactive game (To See or Turbidity!) , and educational giveaways distributed.	Approx. 5000 attendees
6/25, 6/26, 6/29, 6/30/2015	Stormwater Demonstration Site (SWDS) - revitalization of stormwater BMPs	NC Aquarium UNCW CFCC	Stormwater Services and Parks Division	The BMPs at the Stormwater Demonstration Site were replanted and revitalized as a joint effort between 2 city divisions and volunteers from local agencies. The plants installed will also attract pollinators and enhance our designation as a Bee City USA.	Various participation numbers over the course of 4 installation days.

Local Cable Access (GTV-8)

Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Monthly rain barrel sale to the public	Inform public about opportunity to purchase reduced cost rain barrels every month
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Re-route your downspout	Inform public about re-routing downspouts to let water soak in,

					instead of runoff
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (video slideshow)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Shortnose Sturgeon narrated slideshow	Inform public about the Shortnose Sturgeon, an endangered species in the Cape Fear River
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Pet waste ordinance slides, detailing ordinance rules and fines	Inform public of pet waste ordinance
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Yard waste ordinance slides, detailing ordinance rules and fines	Inform public of yard waste ordinance
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Stormwater hotline info	Inform public of water pollution/illicit discharge and hotline to report pollution
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (slides)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Stormwater Poster slides	Inform public about hotline, pet waste, yard waste, and where runoff drains

Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	UNCW Buffers PSA
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	Grasshopper Litter PSA
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	Hard to Train a Human Pet Waste PSA 2014 (refilmed in Hi-Def)
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	Yard Waste PSA 2010
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	Johnny Fishpatrick PSA - NC DENR
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	Keep America Beautiful Grasshopper PSA
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	Not your Ashtray PSA
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (documentary)	Cable access TV viewers	Stormwater staff GTV-8 Staff	Documentary	Puget Sound Scuba Urban Pollution documentary
Airs on rotating schedule	GTV-8 City's cable access channel stormwater programming (PSA)	Cable access TV viewers	Stormwater staff GTV-8 Staff	:30 second PSA	Shortnose Sturgeon Documentary

Brochures, Displays, Signs, Welcome Packets, Pamphlets

4/25/2015	Yard Care large format poster	Landscapers Homeowners	Stormwater Services	Yard care poster that highlights waterway-friendly practices and city ordinance information	Distributed to the target audience at events, mailings and by Code Enforcement
5/1/2015	Pet waste signage for pilot program	Drivers General public Complaint drivers	Stormwater Services - education manager and code enforcement personnel	Pet Waste education signage posted in right-of-ways and other publicly owned property to encourage the public to clean up after pets and inform them about pet waste ordinance	The amount of pet waste deposited after signs have been installed will give anecdotal information; complaints and feedback from residents will also give insight into program effectiveness
5/1/2015	Stormwater Demonstration Site (SWDS) - new signage installed	General public Park visitors Mill Creek residents	Stormwater Services	Replacement educational signage for the entire site. Newly redesigned and fabricated	SWDS serves as educational destination for the public to learn about Best Management Practices
6/1/2015	Stormwater Services General brochures	General public City stormwater customers	Stormwater Services	New brochure designed including rate fee increase for Stormwater Services	Distributed by CFPUA to rate customers and by Stormwater Services as events and public meetings.

Newsletters

Summer 2014	Citywide Public Information Report Newsletter	City residents Public library Special events	Stormwater Services Communications Div.	Stormwater drainage improvements article	40,000+ newsletters mailed to city residents
Fall 2014	Citywide Public Information Report Newsletter	City residents Public library Special events	Stormwater Services Communications Div.	Brief highlights about Stormwater Drainage Projects - Inland Greens, S. Bradley Creek, Waltmoor	40,000+ newsletters mailed to city residents
Winter 2015	Citywide Public Information Report Newsletter	City residents Public library Special events	Stormwater Services Communications Div.	Stormwater Projects article - 2013-2014 Stormwater Improvements overview	40,000+ newsletters mailed to city residents
Spring 2015	Stormwater Watch Newsletter Insert included in Citywide Public Information Report Newsletter	City residents Public library Special events	Stormwater Services Communications Div.	UNCW Annual Water Quality Report including Wilmington Watersheds Maps & Fire Station BMPs article	40,000+ newsletters mailed to city residents

Grant Projects

Began Jan 2015 (1st year of 2.5 year grant)	319 Hewletts Creek Watershed BMP Installations Grant (A collaborative approach to voluntary watershed restoration)	Hewletts Creek	NCSU Stormwater Services	Stormwater improvement projects on private and city property	Collaboration with NCSU to implement projects that align with the Bradley & Hewletts Creek Watershed Restoration plan
Began Jan 2014 (2.5 year grant)	319 DREAMS Grant with NCSU	Burnt Mill Creek	NCSU Stormwater Services	Stormwater improvement project on city property housing DREAMS in downtown area of BMC Watershed	Collaboration with DREAMS students and faculty to design and install BMPs which include rain gardens, permeable pavement and cisterns

Ongoing	Developed watershed restoration plan for Hewletts and Bradley Creeks, now being implemented by Watershed Coordinator	Hewletts & Bradley Creek watershed residents and businesses	Partners: Stormwater Services NC Coastal Federation Town of Wrightsville Beach Withers and Ravenal UNCW	Heal Our Waterways program implementation	Watershed restoration plan implementation began in 2013

Employee Trainings

10/6/2014	Illicit Discharge presentation to City Engineers and field personnel	Engineering Division	Stormwater Services - compliance officer	Stormwater//Illicit Discharge PPT	11 attendees
11/12/2014	BADCO Management Co.	Community members	Stormwater Services - compliance officer	Presentation & Discussion about pet waste problems and city ordinance	35 attendees
7/7/1905	Environmental Stewardship Survey	City of Wilmington Public Services employees	Sustainability committee	Survey to identify environmental stewardship opportunities at the workplace. Several stormwater questions were asked. The survey results were distributed to employees with education information provided with the results	120 employees responded to survey. All 182 employees were given the survey results and education info.

Weekly Update Articles for City Council / City Staff / Media

Weekly	Weekly Email Update	City Council Employees Media	Various city staff	Weekly update of city news, events, projects, etc.	Stormwater information was included in 18 Weekly Updates

Citizen Contacts

Ongoing/ regularly	Stormwater office via phone, email or walk-in	Citizens/ Businesses	Stormwater staff	Responses to requests for information, literature, etc.	Information provided regarding specific nature of contact

LEGEND:

COW = City of Wilmington

NHSWCD = New Hanover Soil & Water Conservation District

CFRW = =Cape Fear River Watch

WECT-TV6 = NBC station

CUMULUS = radio stations

NCSU = NC State University

FB = Facebook

HOW = Heal Our Waterways program

CITY OF WILMINGTON
STORMWATER SERVICES

Public Outreach & Education, Public Involvement & Participation Plan

Compiled
August 2012
Updated as Needed

Table of Contents

Introduction

Stormwater runoff is water from rain or irrigation that flows over land and into local creeks, streams and waterways. According to the US Environmental Protection Agency (EPA), stormwater runoff is the #1 source of surface water pollution.

Impervious surfaces are hard surfaces that water cannot penetrate, such as driveways, streets, parking lots and rooftops, which prevent stormwater runoff from naturally soaking into the ground. Instead, runoff flows over these surfaces picking up pollutants such as pet waste, auto fluids, fertilizers, pesticides, litter, and yard waste and carries them through the stormwater drainage system, directly into our waterways.

In Wilmington, runoff travels through a complex, interconnected system of storm drains, pipes, ditches, creeks and other natural and man-made features. In Wilmington, the storm drainage system consists of approximately:

- 9,000 catch basins and manholes
- 220 miles of pipe
- 200 miles of open drainage (ditches, creeks, and channels)
- 145 acres of retention ponds including Randall Pond and Silver Stream Pond
- 12 miles of culverts under roads
- Greenfield Lake, Love Grove Tidegates
- Stormwater BMPs such as Kerr Avenue Wetland, Park Avenue Bioretention Area, Wade Wetland, etc.

This plan for Public Education and Outreach and Public Participation and Involvement is a segment of the City of Wilmington's Comprehensive Stormwater Management Plan (hereinafter referred to as Stormwater Plan), as required by the State of North Carolina Department of Environment and Natural Resources Division of Water Quality Permit No. NCS000406. The permit authorizes the City of Wilmington to discharge stormwater from their municipal separate storm sewer system (MS4) to the receiving waters of the State within the Cape Fear and White Oak River Basins, under Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) Program.

As required by the NPDES Permit, the City of Wilmington's Stormwater Plan must detail the City's outreach program for the five-year term of the stormwater permit. This document serves as the Outreach and Education Plan.

Since 1993, scientists at the UNC Wilmington Center for Marine Science Research have been assessing the water quality of Wilmington's major waterways. Approximately 70 sampling sites assess the water quality of 10 of Wilmington's tidal creeks, as well as Greenfield Lake, and the Cape Fear River. The findings are reported annually and serve as a valuable tool to gauge changes in water quality in the area.

Public education, outreach, and participation are essential tools to develop stewardship and awareness of stormwater pollution issues in Wilmington. By successfully reaching out to citizens

and businesses, we can reduce the pollution in our local surface waters preserving them as a healthy, beautiful resource for our area.

Mission of Stormwater Services

The City of Wilmington Stormwater Services provides comprehensive management of the stormwater drainage system in order to protect our community and environment.

Goals & Objectives ~ Outreach, Education, Involvement Program

The City of Wilmington Stormwater Services strives to improve local water quality by creating awareness of stormwater runoff issues through public education and outreach and public participation and involvement.

Through education, outreach, and involvement we educate citizens, businesses and employees about the stormwater drainage system, sources of stormwater pollution, the direct impacts of stormwater pollution on local waterways, and what we can do as a community to prevent and reduce stormwater pollution. The program complies with the City's NPDES stormwater permit.

The education program addresses the following facts as a basis for education efforts:

- Storm drains and drainage conveyances (i.e. ditches) carry water directly to local waterways without any treatment. Only rain should go down the storm drain!

- Impervious surfaces increase the speed and volume of polluted stormwater runoff entering the stormwater drainage system.

- Polluted stormwater runoff flows directly into local waterways where it impacts water quality, aquatic habitat, shellfish harvest areas, and drinking water supplies.

- Plants, shrubs, trees, and other vegetation greatly reduce stormwater pollution by absorbing and filtering stormwater runoff and preventing soil from washing away.

- Reduce the amount of polluted stormwater runoff entering local waterways by utilizing BMPs (Best Management Practices). BMPs are any action or on-the-ground practice that reduces the amount of stormwater and pollution flowing into waterways. BMPs such as rain gardens, rain barrels, and re-routing downspouts to grassy areas allow stormwater runoff to soak into the ground and be cleaned and filtered naturally.

The program also addresses the six major pollutants that impact Wilmington's waterways:

1) Fecal coliform bacteria
2) Nutrients
3) Sediment
4) Chemicals
5) Litter
6) Vehicle Pollution

Target Pollutants, Sources, and Audiences

The following pollutants have been identified as significant sources of pollution in Wilmington's waterways. Many of these pollutants also negatively impact the proper functioning of the stormwater drainage system. These particular pollutants were chosen based on several sources including UNCW's water quality monitoring data, New Hanover Animal Control statistics, and the 2006 NC Statewide Stormwater Survey of North Carolina residents.

This is a working document; therefore the goals and target pollutants will change over time based on the target audiences' knowledge and implementation of stormwater-friendly practices, as well as water quality data and trends.

Target Pollutant	**Pollutant Origin**	**Likely Pollutant Sources / Target Audience** (Residential & Commercial/Industrial)
Fecal Coliform Bacteria	⌖ Domestic & wild animal waste	- Pet owners and their pets - Stray dogs, feral cats - Boarding kennels - Veterinarian facilities - Pet-related businesses
Nutrients (nitrogen and phosphorous)	⌖ Fertilizers ⌖ Yard waste	- Homeowners - Gardeners - Landscapers/Landscaping Companies - Turf maintenance professionals - Golf courses
Sediment (sand, soil, etc)	⌖ Eroding stream banks ⌖ Exposed soil ⌖ Construction	- Construction sites/land-disturbing activities - Landscapers/landscaping companies - Homeowners
Chemicals	⌖ Pesticides ⌖ Pressure washing chemicals ⌖ Vehicle and boat washing soaps	- Homeowners - Pressure washing businesses - Mobile detailers - Pressure washers - Turf/landscape professionals - Restaurants
Litter	⌖ Plastics ⌖ Paper ⌖ Cigarette butts	- Motorists - Smokers - Restaurants - Retail centers - Construction sites
Vehicle Pollution	⌖ Vehicle fluids (motor oil, antifreeze, etc) ⌖ Vehicle washing soaps/detergents	- Motorists' vehicles - Backyard mechanics - Vehicle maintenance repair shops - Mobile detailers - Dealership lots

Target Pollutant: FECAL COLIFORM BACTERIA (domestic and wild animal waste)

Nutrients, such as nitrogen and phosphorus, enter our waterways in excessive amounts via stormwater runoff that carries fertilizers and yard waste into the storm drainage system. High nutrient loads causes algal blooms, low dissolved oxygen levels, fish kills, and impaired aquatic habitats.

Pollutant Source:

Likely Residential Sources: Domesticated Animals, Stray and Feral Animals
Likely Commercial/Industrial Sources: Boarding Kennels, Veterinarian Facilities, Pet-Related Businesses

Background/Environmental Impacts:

- Storm drains and drainage conveyances (i.e. ditches) carry polluted runoff directly to local waterways without any treatment. Only rain should go down the storm drain!
- Fecal coliform bacteria is the #1 pollution problem impacting Wilmington's creeks and waterways, as identified through water quality monitoring. The primary source of this bacterial pollution is canine and outdoor cat waste.
- Stormwater runoff washes bacteria, parasites, viruses, and nutrients from animal waste directly into our waterways.
- There is a direct correlation between the amount of impervious surface coverage and fecal coliform bacteria counts in Wilmington's waterways.
- Once in our waterways, these pathogens can cause shellfish bed closures, swimming advisories, algal blooms, low dissolved oxygen levels, fish kills, and impaired aquatic habitat.
- High levels of fecal coliform bacteria can cause diseases and infections in humans upon contact such as roundworm, salmonellosis, toxoplasmosis, E. coli, and gastroenteritis.

Target Pollutant: FECAL COLIFORM BACTERIA (domestic and wild animal waste)

Key Outreach Messages:

- Messages should connect uncollected pet waste to water quality problems and human health impacts.
- Dogs waste is a major source of bacterial pollution considering their population, daily defecation rate, and bacterial production. Outdoor cats are also a major problem for these same reasons; steps should be taken to control their waste as well.
- Bacteria can cause diseases in humans and other animals.
- Pet owners have a responsibility to clean up after pets and dispose of the waste properly.
- Debunk barriers to cleaning up after pets (i.e. it's not fertilizer, it's okay to use a bag to pick it up with your hand, pet waste is still a problem even if it's in your own backyard, etc).
- Pet owners should be aware of and abide by the City's Pet Waste Ordinance:
  - Fully and immediately clean up after pets on any public property. *(Public property consists of streets, sidewalks, right of ways, parks, plazas, stream banks, public accesses, pathways, drainageways, storm drains, creeks, officially accepted easements, etc.)*
  - Carry a clean-up device (i.e. bag, scooper) at all times.
  - Show the clean-up device to a Code Enforcement Official, if requested.
  - Bag and dispose of pet waste in a closed trash receptacle or refuse container.
  - Do not flush pet waste down the toilet (Cape Fear Public Utility Authority ordinance).
  - Fines for non-compliance with the City's pet waste ordinance are $250 per occurrence.
- Utilizing BMPs, such as rain gardens, rain barrels, and re-routing downspouts to grassy areas allows polluted runoff to soak into the ground and be cleaned and filtered naturally.

Target Audience	Audience Description (Why Selected?)	Suggested Outreach Strategies
Pet Owners	By right of ownership, a pet owner has the power to reduce pet waste-contaminated runoff by cleaning up after their pet. Survey data reports both females and males should be targeted, with a slightly higher % of males not picking up.	• Educate citizens about the City's pet waste ordinance via the stormwater website and GTV • Participate in local pet-related events (i.e. Paw Jam) • Continue Canines for Clean Water program (C4CW) • Post educational signs at pet waste stations • Distribute pet waste education brochures and flyers during special events • Air public service announcements in paid spots • Direct mail enforcement letter to neighborhoods with complaints • Include blurbs in the citywide newsletter • Utilize enforcement actions when necessary for violators of the pet waste ordinance
Pet-Related Businesses	Targeting pet-related businesses will educate those in the profession about best practices for pet waste management and also serve as a conduit to deliver outreach messages to the public. Businesses include: - Veterinarians - Animal hospitals - Kennels - Pet stores - Groomers - Trainers - Petsitters	• Encourage businesses to be models for environmental stewardship at their place of business (i.e. install pet waste receptacles in parking lot islands or properly design kennel runs for waste removal) • Encourage businesses to post the pet waste education poster and/or brochures for customers to view

	- Doggie day care - Local pet magazines - Local adoption agencies - NHC Animal Control - NH Humane Society	
Management/ Residents of Apartment Complexes	Apartment complexes often experience problems with uncollected pet waste on their property. In Wilmington, a large number of college students with pets reside in these complexes. Management can play a key role in educating their residents about pet waste and implementing and enforcing a pet waste management policy on their property.	• Provide materials to educate the management of apartment complexes on how to institute a pet waste policy, as well as provide a consistent policy for enforcement • Encourage apartment complex management to educate their residents by distributing the City's pet waste education materials to each apartment • Encourage management to post the pet waste education poster and/or brochure in common areas for their residents to view • Encourage management to be make it easy for their residents to manage pet waste by installing pet waste receptacles around the property
Assessment & Evaluation		
• Assess and evaluate local water quality utilizing UNCW Center for Marine Science annual water quality monitoring, specifically Fecal Coliform counts in local waters • Periodically assess the habits of pet owners and pet industry professionals by: - Direct observation of habits *(collects vs. doesn't collect, where dispose, etc.)* - Count of citations issued for pet waste violations - Count of reported complaints to Stormwater Hotline regarding pet waste violations		

Target Pollutant: NUTRIENTS (fertilizers, yard waste)

Nutrients, such as nitrogen and phosphorus, enter our waterways in excessive amounts via stormwater runoff that carries fertilizers and yard waste into the storm drainage system. High nutrient loads causes algal blooms, low dissolved oxygen levels, fish kills, and impaired aquatic habitats.

Pollutant Source:
Likely Residential Sources: Homeowners, Gardeners, etc.
Likely Commercial/Industrial Sources: Landscapers, Turf Maintenance, Golf Courses, etc.

Background/Environmental Impacts:

- Storm drains and drainage conveyances (i.e. ditches) carry polluted runoff directly to local waterways without any treatment. Only rain should go down the storm drain!
- Lawn fertilization is one of the most widespread watershed behaviors by homeowners and landscaping companies.
- Improper application of fertilizer results in the introduction of nutrients into our waterways via stormwater runoff.
- Yard waste (i.e. grass clippings, leaves, pinestraw) are often improperly blown or directed into streets, storm drains, and ditches leading to clogged stormwater conveyances resulting in flooding of streets and property. This organic matter can also flow through the drainage system introducing nutrients and pesticides into waterways.
- Fertilizers and yard waste that end up in local surface waters impact aquatic life by introducing an overabundance of nutrients, a process known as eutrophication.
- Eutrophic water conditions cause algal blooms. Once the excess nutrients are used up in a water body, the algae will decompose using up the dissolved oxygen in the water, which aquatic organisms (i.e. fish) need to survive. This can lead to fish kills.
- Algal blooms produced from eutrophic conditions also prevent sunlight from reaching benthic (bottom-dwelling) aquatic plants and organisms.
- Some types of algal blooms are toxic to plants and animals, including humans.

Target Pollutant: NUTRIENTS (fertilizers, yard waste)

Key Outreach Messages:

- A direct link exists between improper fertilizer application and yard waste disposal and poor water quality resulting in algal blooms, fish kills, and habitat degradation.
- Grasscycle! Leave grass clippings on the lawn to reduce or eliminate the need for fertilizer. Clippings conserve soil moisture and are a natural fertilizer.
- Compost yard waste and use the resulting material in your landscape or garden
- Contain yard waste for City pickup.
- Before fertilizing, get a free soil test from NHC Cooperative Extension. It will tell you the exact nutrients your lawn needs and could save you money spent on fertilizer.
- Design and maintain lawns with the goal of absorbing runoff. For instance, minimize the use of lawn area and fertilizer by replacing with native trees, shrubs, plants and groundcover.
- Use alternatives to fertilizer such as organic fertilizer, compost, grasscycling, worm poop, etc.
- If fertilizer must be used, read the label and apply correctly. Improper application includes over-applying by frequency or volume, applying the wrong type, applying before rain, and failure to clean excess fertilizer from driveways and streets after application.
- Utilizing BMPs, such as rain gardens, rain barrels, and re-routing downspouts to grassy areas allows polluted runoff to soak into the ground and be cleaned and filtered naturally.
- Improper disposal of yard waste (leaves, grass clippings, pine straw) can clog the storm drainage system causing flooding of streets and property.
- Landscapers/Property owners should be aware of and abide by the City's Yard Waste Ordinance:
    - It is unlawful to rake, sweep, blow, wash, direct or place any debris into the storm drainage system. (*The storm drainage system consists of streets, storm drains, ditches, swales, creeks, lakes, rights-of-way, dedicated easements, etc).*
    - Property owners shall keep all ditches, drains, swales, and other drainageways on their property free from obstructions which would impede the flow of water.
    - Fines for non-compliance with the City's yard waste ordinance are $250 per occurrence.
- Landscaping company employees should be trained on proper fertilization and yard waste disposal practices.

Target Audience	Audience Description (Why Selected?)	Suggested Outreach Strategies
Homeowners/ Residents	Many citizens improperly apply fertilizer and/or blow yard waste into the street or storm drain. Target audience is majority male homeowners for self-application of fertilizer and yard waste disposal. Also target households that hire landscaping companies.	• Distribute fertilizer and yard waste education brochures and soil test kits to Wilmington residents during HOA presentations and special events like Earth Day • Inform residents about proper disposal methods for yard waste including grasscycling, composting, and collecting yard waste for pick-up by posting info on GTV • Post educational lawn care poster on stormwater website • Air public service announcements on mass media outlets • Include blurbs in citywide newsletter • Submit periodic press releases to the media

Landscapers and Turf Maintenance Professionals	Landscaping and turf maintenance companies frequently use fertilizers and produce a large amount of yard waste on a regular basis. Employees are often male and of Hispanic background.	• Distribute large format education poster about yard waste disposal to landscapers and lawn maintenance companies, available in both English and Spanish • Emphasize proper staff training on practices like fertilization application and yard waste disposal • Distribute fertilizer education info to golf course management • Post outreach materials in English and Spanish on stormwater website and GTV • Utilize enforcement actions when necessary for violators of yard waste ordinance
Assessment & Evaluation		
• Periodically assess the habits of homeowners and landscape industry professionals by: - Direct observation of the fertilizer application habits of homeowners and landscape industry - Surveys of the fertilizer application habits of homeowners and landscape industry professionals • Assess and evaluate local water quality utilizing UNCW Center for Marine Science annual water quality reporting, specifically nitrogen, phosphorus, BOD, and algal bloom frequencies and locations		

Target Pollutant: SEDIMENT (sand, dirt, gravel, clay, soil particles)

Sediment is generated by the process of natural or accelerated erosion and consists of sand, dirt, clay, or soil particles. Sedimentation occurs when stormwater runoff carries soil particles from a disturbed land area or eroding stream bank to surface waters. Sediment can quickly fill in a waterbody, clog the storm drainage system, and cause turbidity and problems for aquatic life.

Pollutant Source:
Likely Residential Sources: Yards, Driveways, etc.
Likely Commercial/Industrial Sources: Construction Sites, Landscapers, Clear-cut Land, etc.

Background/Environmental Impacts:

- Storm drains and drainage conveyances (i.e. ditches) carry polluted runoff directly to local waterways without any treatment. Only rain should go down the storm drain!
- Both natural and accelerated erosion produce sediment. Natural erosion is the process of weathering that forms soil. Accelerated erosion is a result of land-disturbing activities by humans that loosen topsoil, making the land more prone to erode quickly (i.e. construction-related activities).
- While natural erosion contributes sediment to waterways, the majority of sediment comes from areas where accelerated erosion has occurred. Stormwater runoff carries soil particles from a disturbed area of land to local creeks and streams. The waves created by boaters can also cause accelerated erosion near the banks.
- Excessive sedimentation can fill in a water body or clog the storm drainage system, leading to flooding. Sedimentation also impacts bottom-dwelling organism by smothering fish eggs, shellfish, coral and benthic (bottom-dwelling) plants.
- Sediment can also cause water to become cloudy, also known as turbidity. Turbidity impairs the photosynthesis of aquatic plants, as well as the ability of aquatic animals to breathe and see prey/predators.
- Sediment serves as a “transport vehicle” for other pollutants such as nutrients, metals, and bacteria. These pollutants attach to sediment particles and cause additional water quality issues when the sediment gets stirred up (i.e. boating, hurricanes, etc) and re-pollutes the water.
- Other sources of sediment include poorly vegetated areas in a yard or landscape.

Target Pollutant: SEDIMENT (eroding streambanks, construction, exposed soil)

Key Outreach Messages:

- Any land-disturbing activity including gardening, planting, construction, etc. can produce sediment which can lead to flooding of streets and property when the sediment is carried into the storm drainage system via stormwater runoff.
- There is a direct link between sediment and poor water quality, in addition to impacts on aquatic life and habitat.
- Residents can plant groundcover, shrubs, and trees to hold soil in place and prevent erosion. Use native plants whenever possible – they don't need fertilizers and pesticides. For properties with sandy soil, mix organic matter (i.e. compost) in with the sand to allow plants to grow better.
- Mulch should be used to cover exposed soil and prevent it from washing away.
- Sediment should be collected off paved surfaces and not rinsed or blown into the drainage system.
- Lack of vegetation along waterfront property and streambanks can produce significant erosion. These types of property owners should be encouraged to plant vegetative buffers.
- Developers should follow all sedimentation and construction site laws and practices. Construction site violations can be reported to the State Hotline: 1-800-STOP-MUD
- Utilizing BMPs, such as rain gardens, rain barrels, and re-routing downspouts to grassy areas, allows polluted runoff to soak into the ground and be cleaned and filtered naturally.

Target Audience	Audience Description (Why Selected?)	Suggested Outreach Strategies
General Public/ Homeowners	The environmental consequences of sedimentation are not widely understood by citizens. Sources of sediment in our surface waters are primarily the result of human-related activities. Homeowners may have exposed soil in lawns or landscape beds or poorly vegetated areas on their property. Target both males and females.	• Encourage homeowners to plant vegetation or apply mulch to anchor soil in place and prevent erosion during HOA or community presentations • Post outreach materials on stormwater website and GTV • Lack of vegetation along waterfront property and streambanks can produce significant erosion. These types of property owners should be encouraged to plant vegetative buffers. • The public should be made aware of the City's yard waste ordinance via GTV and paid spots on mass media
Construction/ Landscape Professionals	Construction, landscape, and related industries significantly contribute to sediment loading in waterways. Employees in this field are often male.	• Promote compliance with the land development code and sedimentation and erosion control laws • Encourage proper staff training with construction, landscaping, and related businesses • Post outreach materials on stormwater website and GTV • Construction workers and landscapers should be aware of the City's yard waste ordinance which prohibits sediment from being blown into streets and storm drains. Provide landscaping companies with the yard waste poster that addresses sediment

Assessment & Evaluation

- Assess and evaluate local water quality utilizing UNCW Center for Marine Science annual water quality reporting, specifically Total Suspended Solids (TSS)
- Gather information from NHC Sedimentation and Erosion program about violations within the city

Target Pollutant: CHEMICALS (pesticides, pressure washing and cleaning soaps)

Stormwater runoff washes harmful chemicals found in pesticides, pressure washing cleaners, vehicle washing soaps and other illicit discharges directly into our waterways. All of these pollutant sources contain toxic chemicals that can persist in the environment, causing toxicity in humans and aquatic organisms, in addition to contaminating drinking water resources.

Pollutant Source:
Likely Residential Sources: Homeowners, Gardeners, Car/Boat Owners, etc.
Likely Commercial/Industrial Sources: Pressure Washers, Vehicle Washing Businesses, Turf/Landscape Professionals, Restaurants, etc.

Background/Environmental Impacts:

- Storm drains and drainage conveyances (i.e. ditches) carry polluted runoff directly to local waterways without any treatment. Only rain should go down the storm drain!
- An illicit discharge is any unlawful disposal, placement, emptying, dumping, spillage, leakage, pumping, pouring, emission, or other discharge of any substance other than stormwater into the storm drainage system.
- Chemicals and cleaning agents used to wash cars, boats, driveways and other surfaces are carried into storm drains and eventually into our waterways. These chemicals can destroy the external mucus layer on fish that protects them from bacteria and parasitic infections.
- Commonly used organophosphate pesticides are present in stormwater runoff and are toxic to aquatic life in receiving water bodies. Pesticides bio-accumulate up the food chain and are harmful to beneficial insects, humans and other wildlife, as well as entire aquatic ecosystems.

Target Pollutant: CHEMICALS (pesticides, pressure washing/vehicle washing soaps and cleaners, etc.)

Key Outreach Messages:

- There is a direct link between the use of chemicals on land (i.e. pesticides, pressure washing cleaners) and water quality and habitat impacts (i.e. frogs with six legs).
- Install native plants which do not require pesticides or fertilizers.
- Use alternatives to pesticides such as ladybugs, weeding by hand, and organic pesticides.
- If you must apply pesticides, read the labels and apply the correct amounts. Do not apply before rain.
- Suggest less toxic, environmentally-friendly alternatives to chemicals.
- Promote info on how to properly dispose of chemicals and other household chemicals, including promotion of Household Hazardous Waste Collection Days.
- Pressure washing surfaces and washing cars/boats using soaps or cleaning agents of any toxicity level can negatively affect water quality. These surfaces can only be washed legally with plain, clear water.
- Wash on grassy areas that can absorb and filter the chemicals and wastewater naturally.
- Businesses are required to capture and discharge the wastewater legally in a treatment system.
- The City's Illicit Discharge ordinance specifies that it is unlawful to dispose of or discharge any substance other than stormwater into the storm drainage system. Fines are up to $10,000 per offense.
- Utilizing BMPs, such as rain gardens, rain barrels, and re-routing downspouts to grassy areas allows polluted runoff to soak into the ground and be cleaned and filtered naturally.

Target Audience	Audience Description (Why Selected?)	Suggested Outreach Strategies
Homeowners / Residents	All citizens have the potential to contribute chemical pollution by washing outdoors (i.e. driveways, homes, lawn furniture) or by using pesticides around their property. Target a higher % of males.	• Distribute educational materials to residents about practicing environmentally safe gardening/lawn maintenance and washing of materials outdoors • Emphasize compliance with the City's Illicit Discharge ordinance • Promote the stormwater hotline to report illicit discharges • Post outreach materials on stormwater website and GTV • Promote Household Hazardous Waste Collection Days
Mobile Detailers, Pressure Washers	Businesses that wash surfaces often use cleaning agents containing chemicals that are harmful to our waterways. These chemicals can be easily washed into the storm drainage system. Target males.	• Mail educational info to pressure washing businesses and mobile detailers • Post outreach materials on stormwater website and GTV
Landscape/Turf Maintenance Professionals	Landscape/turf maintenance professionals frequently use pesticides. Employees in this field are often male.	• Promote training of workers for proper application of pesticides • Emphasize use of pesticides as a last resort; promote alternatives • Post outreach materials on stormwater website and GTV
Restaurants	Restaurants often clean equipment or dump mop wash water outdoors. The discharge of any type of wastewater into the storm drainage system is unlawful.	• Distribute educational poster to local restaurants • Disseminate business checklist to ensure stormwater-friendly practices • Encourage employee training on wastewater practices, proper chemical use and disposal, etc. • Promote compliance with the illicit discharge ordinance via GTV and website

Assessment & Evaluation

- Conduct a survey of restaurants to gauge compliance with local stormwater ordinances and stormwater-friendly

practices

- Periodically assess the pesticide application habits of homeowners and landscape professionals by:
    - Direct observation of pesticide application habits of homeowners and landscape professionals
    - Surveys of pesticide application habits of homeowners and landscape professionals
- Assess and evaluate local water quality utilizing UNCW Center for Marine Science annual water quality reporting, specifically focusing on illicit discharge tested locations

Target Pollutant: LITTER (plastic, paper, cigarette butts, etc.)

Litter is generated as a result of improperly discarded plastics, food wrappers, cigarette butts, etc. that can wash into waterways via the storm drainage system and impact habitat, wildlife, and water quality.

Pollutant Source:
Likely Residential Sources: Motorists, Smokers, General public, Trash pickup incidental litter, etc.
Likely Commercial/Industrial Sources: Restaurants, Retail Centers, Construction Sites, etc.

Background/Environmental Impacts:

- Storm drains and drainage conveyances (i.e. ditches) carry polluted runoff directly to local waterways without any treatment. Only rain should go down the storm drain!
- Litter is carried by stormwater runoff into the drainage system where it can clog storm drains and drainage routes and cause flooding on streets and property.
- Litter that washes into local surface waters can be mistaken by fish, birds and other wildlife for food that become sick or die from ingesting it. Wildlife also can become entangled in litter and die as a result.
- Litter is often produced as a result of being dropped during trash pickup.
- Litter introduces chemical pollutants into waterways, such as plastics and cigarette butts.
- Cigarette butts are a major source of litter and contain many dangerous toxins that can leach into waterways.
- Littered areas beget litter; areas that are clean tend to repel litter.

Target Pollutant: LITTER (plastic, paper, cigarette butts, etc.)

Key Outreach Messages:

- Flooding of streets/property is sometimes attributed to the accumulation of litter in the drainage system.
- A direct link exists between animal impacts, habitat destruction, and water quality as a result of littering.
- Cigarette butts leach chemicals such as cadmium, lead, and arsenic into the aquatic environment within one hour of contact with water.
- The 2011 Ocean Conservancy International Coastal Cleanup identified cigarette butts as the #1 most littered item.
- Litter attracts wildlife to the side of the road where they are likely to get hit by oncoming vehicles.
- Utilizing BMPs, such as rain gardens, rain barrels, and re-routing downspouts to grassy areas allows polluted runoff to soak into the ground and be cleaned and filtered naturally. BMPs can also trap litter so it doesn't wash away.

Target Audience	Audience Description (Why Selected?)	Suggested Outreach Strategies
Youth (8th grade presentations)	Litter habits cannot be confined to a particular demographic in most cases. However, targeting 8th graders during yearly presentations should be a priority since they are in the developmental stage of thinking and forming opinions.	• Make students aware of the impact of littering and the toxicity of many littered items • Emphasize easy solutions to littering - using trash or recycling receptacles • Promote the 5 R's: Reduce, Reuse, Recycle, Refuse, Repurpose • Explain the negative impacts on wildlife species (i.e. plastic bags look like jellyfish to sea turtles)
Smokers	Cigarette butts are the largest environmental litter problem both locally and worldwide. Target both male and female smokers.	• Display signs encouraging proper disposal of cigarette butts in public areas (i.e. Wave Transit buses) • Post outreach materials on stormwater website and GTV • Encourage use of ashtrays for smokers • Distribute pocket ashtrays at public events
Motorists and Pedestrians	Along roadways, motorists (52%) and pedestrians (23%) are the largest contributors of litter. Target males and females.	• Educate citizens about North Carolina's Swat-A-Litterbug program via website and GTV • Remind motorists about the proper disposal of trash by displaying educational signs on public transportation vehicles (i.e. Wave Transit buses) • Encourage use of car litterbags for proper trash disposal

Assessment & Evaluation

- Conduct an informal poll before 8th grade presentations to gauge how many students litter and then pledge not to litter after the presentation.
- Elicit count of Stormwater Maintenance Department responses to clogged stormwater drainage system components as a result of litter.
- Have Stormwater Maintenance crews continually provide field observations of problem litter areas for clean-up by community service workers or Cape Fear River Watch.
- Periodically assess the litter disposal habits of Wilmington residents by:
  - Direct observation of habits
  - Surveys of habits
  - Count of citations issued pertaining to improper litter disposal habits
  - Count of reported violations to Stormwater Hotline, Keep America Beautiful of NHC, or Swat-a-Litterbug from New Hanover county

Target Pollutant: VEHICLE POLLUTION (vehicle fluids, washing soaps/detergents, etc.)

Vehicle pollution comes from the intentional or unintentional disposal of vehicle fluids into our waterways, some of which washes off impervious surfaces into the drainage system or is disposed of improperly. These fluids are insoluble and can easily contaminate water resources, as well as poison fish and other aquatic organisms.

Pollutant Source:
Likely Residential Sources: Motorists, Backyard Mechanics
Likely Commercial/Industrial Sources: Vehicle Maintenance Repair Shops, Mobile Detailers, Dealership Lots

Background/Environmental Impacts:

- Storm drains and drainage conveyances (i.e. ditches) carry polluted runoff directly to local waterways without any treatment. Only rain should go down the storm drain!
- Vehicles have seals and gaskets that have the potential to leak a variety of fluids, such as oil and grease. An accumulation of these fluids on roadways and parking lots gets carried away by stormwater runoff emptying into our waterways.
- Commonly, it is the backyard mechanic that is illegally dumping or draining vehicle fluids.
- 1 quart of motor oil can contaminate 250,000 gallons of water.
- Once vehicle pollution enters a body of water, it disperses quickly and forms a film on the water's surface, making oxygen transfer from the surface to the bottom difficult, as well as toxic for aquatic organisms.
- It is a common watershed behavior to wash vehicles on impervious (hard) surfaces
- Washing vehicles or boats can cause nutrients, heavy metals, hydrocarbons and grime to wash down the street and into waterways.
- Soaps and detergents used to wash vehicles or boats are carried into storm drains and eventually into our waterways. These chemicals can destroy the external mucus layer on fish that protects them from bacteria and parasitic infections.
- Vehicle washers are typically unaware of the content of washing soaps and detergents and their impact on water quality.

Target Pollutant: VEHICLE POLLUTION (vehicle fluids, washing soaps/detergents)

Key Outreach Messages:

- There is a direct link between the introduction of vehicle fluids and water quality degradation, habitat destruction and plant/animal death.
- All vehicles, machinery, and equipment that utilize vehicle fluids (i.e. oil, grease) for operation have the potential to leak and contribute to water pollution.
- Keep vehicles tuned up, check and repair leaks, check tire pressure, and recycle or properly dispose of vehicle fluids and batteries.
- Properly clean up vehicle leaks and fluid spills using an absorbent material (i.e. kitty litter) to soak up the spill. Sweep up contaminated absorbent, put in a sealed bag and place in the trash.
- Driving less, carpooling or using alternative transportation are some of the best ways to prevent vehicle pollution.
- Washing vehicles or boats using soaps/detergents can negatively affect water quality by contaminating them with chemicals, debris, or sediment that is washed off of vehicles, driveways, parking lots, etc.
- Wash vehicles on the grass using a phosphate-free detergent, and/or use a commercial car wash which recycles and treats wash water. If you must wash on pavement, use plain, clear water and no chemicals.
- On-site storage (i.e. fluids, batteries) has the potential to leak during filling, emptying, storage unit failure, or vandalism.
- Business owners should be aware of and abide by the City's Illicit Discharge Ordinance which states that
    - Anyone found responsible for causing a polluting substance to enter the storm drainage system will be subject to a fine up to $10,000 per violation.
    - The city will have the authority to enter property to inspect for illicit discharges, and if found, to require that they be disconnected and permanently closed.
    - Commercial businesses will not be permitted to wash vehicles, equipment, or any other surfaces with any soaps or solvents or dislodge any other substance that may be harmful to surface waters, unless the resulting wastewater is diverted to the sanitary sewer system.
    - Restaurants will not be permitted to discharge any wastewater outside.
    - Dumpster lids must be kept closed and dumpster plugs in place.
    - Swimming pool water must be de-chlorinated before discharging.
    - Floor drains in old buildings, connected to the storm drainage system, will be required to be disconnected and permanently closed.
    - Residents and businesses will be expected to prevent harmful substances from running off into the storm drainage system.
    - Fines for non-compliance with the City's illicit discharge ordinance are up to $10,000 per offense.
- Utilizing BMPs, such as rain gardens, rain barrels, and re-routing downspouts to grassy areas allows polluted runoff to soak into the ground and be cleaned and filtered naturally.

Target Audience	Audience Description (Why Selected?)	Suggested Outreach Strategies
General Public/ Backyard Mechanics	All citizens of driving age have the potential to contribute to vehicle pollution by nature of driving the vehicle or washing it. For backyard dumping of auto fluids, target males.	• Emphasize vehicle maintenance is the #1 priority (i.e. tune ups) • Post outreach materials on stormwater website and GTV • Promote alternative methods of transportation (i.e. public transportation, carpooling, bikes, walking, bio-fuels) • Encourage the utilization of the stormwater hotline to report illegal fluid dumping • Encourage environmental stewardship to practice eco-friendly vehicle washing using commercial car wash businesses or washing vehicles in a grassy area to absorb polluted runoff • Mark storm drains in visible areas to prevent illegal dumping
Vehicle Maintenance	Businesses in auto parts or maintenance/repair-related	• Distribute Auto Care educational poster to businesses for employees to learn about proper vehicle maintenance, fluid

Repair, and Auto Parts Businesses	fields deal with vehicle fluids on a regular basis. Most employees are male.	storage and disposal methods, and the City's Illicit Discharge ordinance • Post outreach materials on stormwater website and GTV
Pressure Washers, Vehicle Washing Businesses, Dealership Lots	Vehicle washing businesses often use cleaning agents containing chemicals that are harmful to our waterways. These chemicals, along with other vehicle fluids, can be easily washed into the storm drainage system. Employees are typically male.	• Distribute educational flyer to businesses • Encourage environmental stewardship to practice eco-friendly vehicle washing using commercial car wash businesses or washing vehicles in a grassy area, or washing using plain water and no chemicals over pavement • Post outreach materials on stormwater website and GTV

Assessment & Evaluation

- Periodically assess vehicle fluid disposal habits of Wilmington residents and businesses
    - Direct observation of habits
    - Surveys of habits
    - Count of reported violations pertaining to chemical leaks or disposal habits to Stormwater Hotline
- Periodically assess vehicle washing and exterior home washing habits of Wilmington residents by:
    - Direct observation of habits
    - Surveys of habits
- Assess and evaluate local water quality utilizing UNCW Center for Marine Science annual water quality monitoring

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APPENDIX C: PUBLIC INVOLVEMENT AND PARTICIPATION

Included in this section:

- BMP Reporting Table
- Cumulative Year End Reports for Contractual/Cooperative Agreements with:
  - Cape Fear River Watch
  - New Hanover Soil & Water Conservation District

DATE OF EVENT/ ACTIVITY	EVENT/ACTIVITY	AUDIENCE	DELIVERED BY (AGENCY)	METHOD OF DELIVERY / MESSAGE	ATTENDANCE/ PARTICIPATION
BMP a. Volunteer community involvement program					
Community Events / Participation					
10/25/2014	Canines for Clean Water booth at New Hanover County Rabies Clinic	Pet owners	NHSWCD	Canines for Clean Water booth - interactive event where pet owners sign a pledge to clean up after their pet and submit a photo of their pet to be featured on our website wilmingtonnc.gov/canines	80 pet owners signed the pledge and received dog bandana, treats, and pet waste literature. Dogs have a chance to be featured on city website
2/19/2015	Lower Cape Fear Stewardship Awards Program	Realtors, Developers, Environmental Agencies, Politicians	Stormwater Services	Staffed display booth and educated participants about stormwater pollution, BMPs, and local stormwater issues and initiatives	150 in attendance
3/21/2015	Canines for Clean Water booth at New Hanover County Rabies Clinic	Pet owners	NHSWCD	Canines for Clean Water booth - interactive event where pet owners sign a pledge to clean up after their pet and submit a photo of their pet to be featured on our website wilmingtonnc.gov/canines	50 pet owners signed the pledge and received dog bandana, treats, and pet waste literature. Dogs have a chance to be featured on city website
4/18/2015	Pawz in the Park at Battleship Park	Pet owners	NHSWCD	Canines for Clean Water booth - interactive event where pet owners sign a pledge to clean up after their pet and submit a photo of their pet to be featured on our website wilmingtonnc.gov/canines	45 pet owners signed pledge and received dog bandana, treats, and pet waste literature. Dogs have a chance to be featured on city website
4/25/15	Lower Cape Fear Earth Day Celebration at Hugh MacRae Park	Festival attendees General public	Stormwater Services (SWS is an annual sponsor of Lower Cape Fear Earth Day Festival)	Display booth to promote stormwater pollution education with an interactive game/quiz and stormwater prizes	4,000+ attendees
6/25, 6/26, 6/29, 6/30/2015	Stormwater Demonstration Site (SWDS) - revitalization of stormwater BMPs	Volunteers from: NC Aquarium UNCW CFCC	Stormwater Services Parks Division	The BMPs at the Stormwater Demonstration Site were replanted and revitalized as a joint effort between 2 city divisions and volunteers from local agencies. Volunteers were educated about SWDS and plant info. The plants installed will also attract pollinators and enhance our designation as a Bee City USA.	Various volunteer participation numbers over the course of 4 installation days.

Monthly Public Rain Barrel Sale

Monthly	Monthly rain barrel sale to the general public. Held the 2nd Thursday of each month at NHC Government Center with partner agency, NHSWCD	General public	Stormwater Services NHSWCD RainBarrelUSA	Stormwater runoff reduction, watershed and water conservation education with rain barrel sale attendees. A new vendor was selected and used this year to offer different barrels and sizes to the public (rainbarrelusa.com)	40 total sales this year

Storm Drain Marking

Ongoing campaign	Campaign to place storm drain awareness markers and educational doorhangers throughout the City	City residents, businesses, landscapers	Contract agencies: CFRW NHSWCD and their volunteers	Stormwater awareness activity. Place educational markers on storm drains and distribute educational doorhangers to residents in neighborhoods where markers are installed	33 markers were placed in the Independence South and Greenfield Lake areas this year

Stream & Litter Clean-ups

Ongoing	Watershed cleanups including the Annual Big Sweep event	Volunteers	CFRW volunteers	Watershed cleanup and/or invasive species vegetation removal Areas cleaned include Greenfield Lake, Smith Creek, Cape Fear River, Burnt Mill Creek, Randall Pond, Kerr Avenue Wetland	10 cleanup events including Big Sweep 139 volunteers contributed a total of 245 hours Collected 207 (30 gallon) bags of trash and/or invasive species vegetation

Watershed Watch Creek Observation Monitoring

Every other month	Volunteer monitoring of creek segments that drain to Cape Fear River	Volunteers are trained to make these observations. City staff receive these reports	CFRW and volunteers	Volunteers conduct bi-monthly observations of area creeks and provide a monitoring report and photos to Stormwater Services	Observations include creek and corridor conditions, vegetation and wildlife present, litter quantity, and suggestions for remediation

Contracts / Cooperative Agreements

The City of Wilmington contracts annually with Cape Fear River Watch (CFRW) and New Hanover Soil & Water Conservation District (NHSWCD) to implement additional public involvement and participation activities, as well as education and outreach activities. Both organizations sign a yearly contract with the City of Wilmington that includes specific deliverables that enable the City to meet many of its federal NPDES permit requirements. A year end summary report for each agency's contract is included in the Appendix. Below is a summary of each agency's annual service deliverables.
CFRW - Supports NPDES permit activities including: 8th grade classroom presentations, educational programs for Wilmington residents, volunteer storm drain marking, volunteer watershed cleanups and coordination, volunteer watershed monitoring program, grant project partnership, Greenfield Lake & Kerr Ave. education/monitoring, support for NPDES public meetings and education efforts, quarterly reporting/invoicing.
NHSWCD - Supports NPDES permit activities such as: 8th grade classroom presentations, fecal coliform/pet waste education, community presentations, local outreach events, LID education, environmental field days, educational website, volunteer storm drain marking, monthly rain barrel sale, Stewardship Development Awards Program coalition and planning member, Hewletts Creek conservation easement program, support for NPDES public meetings and education efforts, quarterly reporting/invoicing.

BMP b. Mechanism for Public involvement

Public Notices, Public Meetings & Community Input

1/12/2015	Targeted direct mailing	Residents impacted by Brookshire/ Beasley project and offer to meet with residents	Stormwater Services	Project info mailing to local residents in affected area	Direct mailing to residents

12/1/2014	Meetings with individual homeowners about Brookshire/Beasley project	Residents and businesses affected by Brookshire/ Beasley stormwater project	Stormwater Services	Brookshire/Beasley individual meetings with residents to discuss upcoming project	Individual residents were seen by appointment
1/12/2015	Targeted direct mailing	Residents impacted by Rogersville Road project, also impacting Landis Farm Road and Eastwood Rd.	Stormwater Services	Project info mailing to local residents in affected areas	Direct mailing to residents
4/13/2015	Targeted doorhangers	Residents and businesses affected by Antelope Trail stormwater project	Stormwater Services	Project info notice distributed to local residents in advance of project work	Project doorhangers delivered to residents
5/1/2015	Targeted direct mailing	Residents impacted by South Bradley Creek drainage project	Stormwater Services	Project info mailing to local residents in affected area	Direct mailing to residents
6/23/2015	Targeted doorhangers	Residents and businesses affected by Gillette Drive stormwater project	Stormwater Services	Project info notice distributed to local residents about pipe failure and repair project	Project doorhangers delivered to residents
1/5/2015	Direct mailing to Restaurants in Wilmington city limits (Year 3 of mailing and survey)	Wilmington Restaurants	Stormwater Services	Mailed code enforcement letter, restaurant education poster, and return mail survey	Year 3 (final year) of the education effort resulted in a 90% correct response rate for survey questions indicating our outreach and enforcement methods are working

BMP c. Maintain Hotline/Help line

The Stormwater Pollution Prevention Hotline was established in January 2010 to field calls from the citizens, businesses, and city employees regarding illicit discharges and other reports of stormwater pollution. The hotline phone # is **910-341-1020** and the web address is **www.wilmingtonnc.gov/reportstormwaterpollution.** Hotline/web reports are routed to the Stormwater Code Compliance Officer who tracks, investigates, and responds to all hotline reports. Information regarding hotline reports is included in the Enforcement Appendix section including the number and nature of hotline phone/web reports.

Ongoing	Stormwater Hotline advertised using various outreach methods: truck magnets, signs, billboards, presentations, etc.	General public	Stormwater Services	Hotline poster, website, GTV-8 and promo items (pens, magnets, sticky notes) are used to raise awareness of the Stormwater Hotline	Distribution varies based on method or event used

Cumulative Year End Contract Agency Reports

CAPE FEAR RIVER WATCH
617 Surry Street
Wilmington, NC 28401
(910) 762-5606
www.capefearriverwatch.org

Quarterly Progress Report #4: April 1 – June 30, 2015

Cape Fear River Watch, Inc. (CFRW), under contract with the City of Wilmington Stormwater Services, will provide the following services for the time period consistent with the City's fiscal year from **July 1, 2014** through **June 30, 2015** for the agreed amount of $**15,500**. These contracted services, implemented as equitably as possible throughout the fiscal year, assist the City in meeting requirements of the federal NPDES Stormwater Permit.

Public Education/Outreach

Total Allocated Cost: $5400 **Conduct Enviroscape Presentations for at least 1/3 of 8th grade science classes in New Hanover County Schools each semester for the entire school year.** The Enviroscape presentation is an integral component of the 8th grade science curriculum in New Hanover County Schools. Presentations will be done in coordination with other environmental agencies and will focus on the specific NC Essential Standard and Objectives for the Hydrosphere unit. Enviroscape instructors will be trained, certified, and follow all applicable Enviroscape policies and procedures as set forth by the City of Wilmington Stormwater Services. A maximum of 3 trained Enviroscape instructors from each agency (which includes the Enviroscape supervisor) are permitted to deliver presentations in 8th grade. CFRW will also work cooperatively with Stormwater Services to provide other presentations in addition to the 8th grade program, as needed. Additional presentations should not conflict or duplicate the 8th grade presentations in any fashion. A summary will be provided for each additional presentation given. CFRW was provided with city funds to purchase an Enviroscape for the express purpose of being available to conduct 8th grade presentations. **($2200)**

July 1 - September 30, 2014

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**
9/23/14	Roland Grise	8	4	105
Other Enviroscape Presentations				
Date	**School/Event**	**Grade**	**# of presentations**	**# of students**
8/4/14	Summer Camp	4-7	1	18

October 1 - December 31, 2014

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**

11/5/14	Holly Shelter	8	4	91
12/1/14	Mosley/Pathways	8	1	8
12/4/14	Trask	8	2	44

January 1 - March 31, 2015

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**
2/17/15	Noble	8	1	30
2/23/15	Noble	8	1	28
3/24/15	Williston	8	2	61
3/26/15	Williston	8	1	32

April 1 - June 30, 2015

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**
4/28/15	Murray	8	2	59
4/30/15	Murray	8	2	55
5/11/15	Myrtle Grove	8	3	88
5/12/15	Myrtle Grove	8	1	29

Provide educational programs for Wilmington residents. Educational programs include First Saturday Seminars, presentations to community and civic organizations, and other scheduled talks in the community. Educational programs for homeowners associations should be planned and coordinated with Stormwater Services. Educational programs will also include eco-tours and birding tours at Greenfield Lake and Smith Creek paddling tours. Wildlife feeding education can be incorporated into these established educational activities, as well as provided by the boathouse staff for lake patrons. Efforts will be made to inform the local media about educational programs. **($3200)**

July 1 - September 30, 2014

First Saturday Seminars			
Date	**Topic**	**Speaker**	**Attendance**
8/2/14	Fracking and water quality	Film	60
9/6/14	Nile River	Julian Monroe	60
Other Presentations by CFRW Staff			
Date	**Organization/Audience**	**Topic/Speaker**	**Attendance**
8/28/14	UNCW	CFRW mission, stormwater/Kay Lynn Hernandez	50
8/18/14	Guilford College	Water Quality/Kemp Burdette	30
9/9/14	Cape Fear Audubon	Water Quality/Kemp	35
9/28/14	UNCW GSA	Water Quality & Volunteer ops/Kemp Burdette	40
Greenfield Lake Tours & Smith Creek Paddle Tours			
Date	**Group Served/Audience**	**Type of Tour/Topic/Location**	**Attendance**
8/5/14	Summer Camp	Walking eco tour and paddleboat tour/history of GFL, stormwater pollution/Greenfield Lake	18
8/12/14	YWCA	Walking and paddle boat eco tour/history of GFL, stormwater, wildlife feeding/Greenfield Lake	30
8/13/14	YWCA	Walking and paddle boat eco tour/history of GFL, stormwater, wildlife feeding/Greenfield Lake	35
8/14/14	YWCA	Walking and paddle boat eco tour/history of GFL, stormwater, wildlife feeding/Greenfield Lake	32
9/14/14	Girl Scouts	Walking and paddle boat eco tour/history of GFL,	11

		stormwater, wildlife feeding/Greenfield Lake	
9/28/14	Girl Scouts	Walking and paddle boat eco tour/history of GFL, stormwater, wildlife feeding/Greenfield Lake	10

October 1 - December 31, 2014

First Saturday Seminars			
Date	**Topic**	**Speaker**	**Attendance**
10/4/14	The River Nile at CFRW	Julian Monroe	60
11/1/14	Viewing the History of Eagles Is.	James Kapetsky	55
12/6/14	Civil War Blockade Runners	Chris Fonvielle	58
Other Presentations by CFRW Staff			
Date	**Organization/Audience**	**Topic/Speaker**	**Attendance**
10/21/14	Men's Club	Water Quality and the CFR/Kemp Burdette	50
Greenfield Lake Tours & Smith Creek Paddle Tours			
Date	**Group Served/Audience**	**Type of Tour/Topic/Location**	**Attendance**
10/18/14	Wilmington residents	Smith Creek Paddle	60
10/20/14	Pre-school	GFL Eco-Tour	11
10/21/14	NHCHS	GFL walking and paddling eco-tour	18
10/30/14	Sunset Park Elementary 4th Grade	Raindrop Journey/GFL	60
11/7/14	Homeschool Group	Paddling Eco-Tour/GFL	5
11/19/14	Gregory Elementary 4th Grade	Raindrop Journey/GFL	63
12/8/14	Social Group, 50ish & Fun	Paddling Eco-Tour/GFL	12

January 1 - March 31, 2015

First Saturday Seminars			
Date	**Topic**	**Speaker**	**Attendance**
1/3/15	Anadromous Fish Restoration of the Cape Fear River	Frank Yelverton	50
2/7/15	Bellamy Mansion from a "green" perspective	Gareth Evans	55
3/7/15	BOEM's role in NC Beach Nourishment Planning	Doug Piatkowski	53
Other Presentations by CFRW Staff			
Date	**Organization/Audience**	**Topic/Speaker**	**Attendance**
1/16/15	CFRW members and community	Fisheries Restoration in the Cape Fear River	350
1/27/15	Lower Cape Fear River Program	Anadromous Fish Restoration/Frank Yelverton	25
2/14/15	American Association for University Women	Water Quality	25
3/3/15	UNCW Environmental Writing	Water Quality issues in the Cape Fear River	15
Greenfield Lake Tours & Smith Creek Paddle Tours			
Date	**Group Served/Audience**	**Type of Tour/Topic/Location**	**Attendance**
1/20/15	Murrayville Fourth Graders	Raindrop Journey/GFL	60
1/21/15	Murrayville Fourth Graders	Raindrop Journey/GFL	60
3/11/15	Island Montossori School/4th and 5th Graders	Raindrop Journey/GFL	24
3/23/15	Cub Scouts and Charperones	Walking Eco-Tour/GFL	18

April 1 - June 30, 2015

First Saturday Seminars

Date	Topic	Speaker	Attendance
4/4/2015	Operation of Jordan Lake and how it affects downstream releases	Tony Young	50
5/2/2015	Invasive Species	Melanie Doyle	35
6/6/2015	Offshore Oil/Gas and Wind Energy: Sources, Questions, Issues, "Facts."	Roger Shew	55
Other Presentations by CFRW Staff			
Date	**Organization/Audience**	**Topic/Speaker**	**Attendance**
4/11/2015	WHQR listeners	Greenfield Lake/Kay Lynn Hernandez & Kemp Burdette	Over 200
4/17/2015	UNCW Env. Ed. Graduate class	Enviroscape and CFRW Env. Ed Mission/Kay Lynn Hernandez	20
5/15/2015	Rotary Club	Water Quality of the CFR /Kemp Burdette	40
5/17/2015	Humanists & Free Thinkers	Water Quality of the CFR/Kemp Burdette	20
6/7/2015	Bellamy Mansion Environmental Awareness Day	How to be a Better Steward of the Environment Every Day	35
6/20/2015	Southport Sail & Power Aquadron	Anadromous Fish Restoration in the CFR/Frank Yelverton	45
Greenfield Lake Tours & Smith Creek Paddle Tours			
Date	**Group Served/Audience**	**Type of Tour/Topic/Location**	**Attendance**
4/2/2015	N. Davidson High School	Walking Eco Tour/history, wildlife, water quality of GFL/Greenfield Lake	55
4/10/2015	CFCI	Raindrop Journey/Greenfield Lake	48
4/13/2015	Forest Hills Elementary	Raindrop Journey/Greenfield lake	60
4/17/2015	UNCW graduate class	Walking Eco Tour/history, wildlife, water quality of GFL/Greenfield Lake	20
4/21/2015	50ish and Fun Meet-Up group	Paddling Eco Tour/Greenfield Lake	10
4/23/2015	Singles Meet-Up Group	Paddling Eco Tour/Greenfield Lake	12
4/27/2015	50ish & Fun Group	Paddling Eco Tour/Greenfield Lake	10
4/29/2015	8th Grade	Paddling and walking Eco Tour/Greenfield Lake	40
4/30/2015	7th Grade	Paddling and walking Eco Tour/Greenfield Lake	95
5/2/2015	LakeFest attendees	Walking Eco Tour/Greenfield Lake	15
5/12/2015	N. Brunswick High School	Paddling and Walking Eco Tour/Greenfield Lake	35
5/18/2015	Meet Up Group	Paddling Eco Tour/Greenfield Lake	12
5/29/2015	Laney High School	Paddling and walking Eco Tour/Greenfield Lake	55
6/18/2015	Laney H.S. STEM program	Paddling and walking Eco Tour/Greenfield Lake	35
6/19/2015	First Presbyterian Church	Paddling Eco Tour/Greenfield Lake	30
5/20/2015	Paddlers	Smith Creek Paddle Tour/CFR,Smith Creek, BMC	46

Public Involvement/Volunteer Efforts

Total Allocated Cost: $7230

Encourage public involvement by engaging city residents/businesses/civic groups in a volunteer Storm Drain Marking program in the city to educate the community about stormwater pollution. A minimum of 2 separate volunteer days is required.

For each outing day, a minimum of 7 markers will be applied per volunteer group and educational doorhangers will be distributed to surrounding residences/businesses. Staff will assist in identifying areas to mark drains, educate volunteers about the purpose of the program, train volunteers in marking and safety, use supplied markers, and help provide oversight of the program. A trained CFRW staff member is required to be present during all storm drain marking activities and with each volunteer group. **($700)**

October 1 - December 31, 2014

Storm Drain Marking			
Date	**Name of Volunteer Organization, Business, etc.**	**# of Volunteers**	**Area Marked & # of Storm Drains Marked**
11/5/14	Cape Fear Academy Science Club	10	River's Edge and 12 drains marked

April 1 - June 30, 2015

Storm Drain Marking			
Date	**Name of Volunteer Organization, Business, etc.**	**# of Volunteers**	**Area Marked & # of Storm Drains Marked**
6/18/2015	First Presbyterian Church	4	Greenfield Lake and 7 drains marked

Coordinate volunteer clean-ups of city watersheds/tributaries 10x per year, once per month (with the exception of July and December). These cleanups will focus on tributaries that flow into Greenfield Lake, Smith Creek, Burnt Mill Creek, Barnards Creek, and the Cape Fear River. 10 monthly clean-ups will be completed including at least one site for Big Sweep, an annual international clean-up. A field trip will be conducted by the city with CFRW in early August to point out the specific tributaries to focus cleanups.

In order to avoid duplication of cleanup activities, CFRW will provide a schedule at least 2 months in advance of proposed cleanup event locations. CFRW will inspect these sites in advance to make sure the area is in need of a cleanup.

Local watershed clean-ups may also include volunteer efforts to remove wetland and aquatic invasive plants with a focus on Greenfield Lake, Kerr Ave, and the Mary Bridger Wetland, but should not be conducted in place of cleanups. Any cleanups conducted on private property should include written permission obtained in advance of cleanups by CFRW from the property owner. These "written permissions" should be included on the end of the year compilation CD.

Efforts should be made to inform the local media about upcoming cleanup events. In addition, significant water quality problems identified during observation monitoring will be reported immediately to the appropriate officials including the city's Stormwater Compliance Officer.

A summary of each clean-up will be completed and submitted to Stormwater Services. *Reports will be submitted using the supplied template and within 10 days of the cleanup event.* Reports will include: the specific watershed, the location within the watershed that was cleaned, number of participants, hours worked, estimate of the quantity of waste materials removed, photographs to document work completed including before and after of site, volunteer photos, and documentation of efforts to secure volunteers and contact the media. **($5430)**

July 1 - September 30, 2014

Watershed Clean-ups				
Date	**Watershed**	**Specific Area Cleaned**	**Trash Collected (ie. type, # of 30 gallon bags)**	**# of Volunteers/ Total Hours Contributed**
8/19/14	Burnt Mill Creek	South of Market St (Down to Carlton Ave) up left bank until Princess Place Dr, then right bank up until Shirley Rd near railroad tracks.	13 thirty-gallon bags of cans, paper, plastics, metals, Styrofoam, sink and tires.	30 volunteers and 22 hours

9/13/14	Burnt Mill Creek	Broad Street Swamp; along side of Covil and Broad St and within wooded area at intersection and across the street.	13 thirty-gallon bags of Styrofoam, glass, plastic, cigarette butts, piping, bed frame, lawn chairs.	5 volunteers and 7.5 hours

October 1 - December 31, 2014

Watershed Clean-ups				
Date	**Watershed**	**Specific Area Cleaned**	**Trash Collected (ie. type, # of 30 gallon bags)**	**# of Volunteers/ Total Hours Contributed**
10/5/14	Greenfield Lake	#4; Along Lake Shore Dr from Willard St to Cyprus Dr & from The Amphitheatre to Carolina Beach Rd. as well as parts of Yaupon Dr, and Wisteria Dr By boat entire Northern half of Greenfield Lake shoreline	18 thirty-gallon bags filled with assorted trash such as Styrofoam cups and take-out trays, plastic bags and cigarette butts. 2 thirty gallon bags with glass and plastic recycling	11 volunteers and 33 hours
11/21/14	Burnt Mill Creek	#1 and #2; . Randall Pond perimeter including both parking locations, and recreation areas, as well inner islands and perimeter by boat. Ditches alongside Marlboro Street and Emerson Street, as well as the drainage creek halfway down Emerson along the railroad tracks.	13 thirty-gallon bags of Styrofoam, glass, plastic, cigarette butts, piping, bed frame, 28 thirty-gallon bags filled with assorted trash such as Styrofoam cups and take-out trays, plastic bags and cigarette butts. Assorted yard scrap and indoor furnishings including a large chair, a toilet, and discarded plates.Total trash disregarding furniture weighing over 180 lbs.	33 volunteers and 66 hours

January 1 - March 31, 2015

Watershed Clean-ups				
Date	**Watershed**	**Specific Area Cleaned**	**Trash Collected (ie. type, # of 30 gallon bags)**	**# of Volunteers/ Total Hours Contributed**
1/10/15	Burnt Mill Creek	BMC #6; 1/2 mile stretch along MacMillan Ave. and drainage ditch and pond near the road.	12 thirty-gallon bags filled with assorted trash.	7 volunteers and 10.5 volunteer hours
2/14/15	Burnt Mill Creek	BMC #9; 1/4 mile stretch along the banks of BMC near One Tree Hill Way	38 thirty-gallon bags filled with assorted trash such as Styrofoam cups and take-out trays, plastic bags and cigarette butts. Hundreds of discarded plastic bottles, glass bottles, and other beverage containers. Two tires, a tv cabinet, various plastic containers, and other assorted trash.	13 volunteers and 26 hours
3/14/15	Greenfield Lake	Along 13th St. to Lakeshore Dr.	42 thirty-gallon bags weighing 360 pounds filled with assorted trash including plastic bags, glass and plastic bottles, cigarette butts, container pots, Styrofoam, wrappers and fast food bags.	17 volunteers and 34 hours

April 1 - June 30, 2015

Watershed Clean-ups				
Date	**Watershed**	**Specific Area Cleaned**	**Trash Collected (ie. type, # of 30 gallon bags)**	**# of Volunteers/ Total Hours Contributed**
4/16/2015	Greenfield Lake	On Medical Center Dr. behind the Hess Station and Bojangles	14 thirty-gallon bags filled with assorted trash including hundreds of plastic bottles, cans, styrofoam, cigarette butts, fast food waste, display stand and skateboard.	14 volunteers and 28 hours
5/21/2015	Burnt Mill Creek	Tidal creek near Oakdale and Calvary Cemetery, off of 11th and Hall St.	5 thirty-gallon bags filled with assorted trash including platic bottles, aluminum cans, cigarette butts, Styrofoam, a headboard, and plastic pieces	5 volunteers and 10 volunteer hours
6/18/2015	Smith Creek	The intersection of Princess St. and Evans St. Up and down the railroad tracks in both directions, and down along the wood line.	9 thirty-gallon bags filled with cigarette butts, plastics, a bed post, electronic equipment and a mattress	4 volunteers and 8 volunteer hours

Conduct a volunteer watershed monitoring program and alert Stormwater Services when volunteers find problem areas. Every other month Watershed Watch volunteer monitoring activities will be conducted in at least 2 locations and will target high priority creeks or creek sections identified in cooperation with Stormwater Services. Observation months are August, October, December, February, April, and June. The Creek Observation Monitoring Form with basic field observations and photo documentation will be submitted for review to Stormwater Services *within 10 days of monitoring.* In addition, significant water quality problems identified during observation monitoring will be reported immediately to the appropriate officials including the city's Stormwater Compliance Officer. Watershed Watch volunteers should include city residents. **($1100)**

July 1 - September 30, 2014

Watershed Watch Reports were submitted in August for Burnt Mill Creek/Shirley Rd. and also for Hurst Branch/Maides Park.

October 1 - December 31, 2014

Watershed Watch Reports were submitted in October and December for Burnt Mill Creek/Shirley Rd. and also for Hurst Branch/Maides Park.

January 1 - March 31, 2014

Watershed Watch Reports were submitted in February for Burnt Mill Creek/Shirley Rd. and also for Hurst Branch/Maides Park.

April 1 - June 30, 2014

Watershed Watch Reports were submitted in April for Burnt Mill Creek/Shirley Rd. and also for Hurst Branch/Maides Park.

Programs/Partnerships

Total Allocated Cost: $700

Serve as an active partner organization on local grant projects and initiatives that benefit local surface water quality and water resources. Examples include local grant projects in the Burnt Mill Creek Watershed, removing trash and performing light maintenance for existing BMPs, and the Smith Creek paddle trail creation. **($700)**

July 1 - September 30, 2014

CFRW conducted a week-long summer camp in August in partnership with DREAMS and the YWCA. Children from low income families were recruited through DREAMS and CFRW staff and interns provided environmental education for YWCA summer campers.
Kay Lynn Hernandez met with Christie Perrin of NCSU in August regarding a partnership effort for a stormwater project at DREAMS and will be an active partner in that effort.

October 1 - December 31, 2014

CFRW assisted NCSU with grant-funded retro-fit project by planting native plants at NHHS on October 2nd.

January 1 - March 31, 2015

CFRW met with DREAMS, YWCA, Friends School of Wilmington and Guilford College to plan summer camp with year-round component focusing on local water quality and resources.

April 1 - June 30, 2015

CFRW met with Guilford College to discuss summer camp planning with year-round component focusing on local water quality and resources.

Monitoring Activities

Total Allocated Cost: $950

Monitor and evaluate the condition of the Kerr Avenue Stormwater Wetland in August and January. Provide outreach/education for groups and/or surrounding businesses. A brief monitoring report will be sent via e-mail to Stormwater Services for the months of August and January. *Observations will be conducted between the 15th – 25th of these months and reports will be submitted using supplied templates within 10 days of observation*. The monitoring report will include observations such as water clarity, invasive species, algae, wildlife, maintenance and restoration opportunities, and photographs.

In addition, significant water quality problems identified during monitoring will be reported immediately to the appropriate officials including the city's Stormwater Compliance Officer.

Outreach and education activities focused on the Kerr Avenue Wetland may include presentations to groups, group cleanups (*independent of the 10 cleanups service*), and periodic outreach/education for business owners/operators and property owners in close proximity to the KA Wetland. **($537.50 of which 250 allocated for education portion)**

July 1 - September 30, 2014

A monitoring report for August was completed and submitted.

January 1 - March 31, 2015

A monitoring report for January was completed and submitted.

April 1 - June 30, 2015

A group clean-up of the Kerr Ave. Wetland was conducted on April 1st, 2015 as well as a discussion of the wetland function, stormwater, water properties and plant types. Seven students from the UNCW Earth Materials Class were involved with the event. The trash was removed and taken offsite to a dumpster on UNCW's campus.

Outreach/education for business owners/operators in close proximity to the KA Wetland was conducted on June 24th. Brochures were distributed and contact names were taken for these businesses:
Trolly Stop, Hairlinz, Tenia's Exclusive Hair, Anthony's, Still Waters Salon, PTs Old Fashioned Burgers, TO Salon and Spa, Low Tide Pub, Real Results Fitness, Kily +Lylling Design, Picture Raving, Studz Hair Design, Long ? Delicatessen, Apple Annies, Big Gals Boutique, Electric etc, Patio Dive Center, Sally Beauty Supply, C. Table Salt, Crystal C., Wilmington Furniture.

Monitor and evaluate the condition of Greenfield Lake in August and January.
A brief monitoring report will be sent via e-mail to Stormwater Services for the months of August and January. *Observations will be conducted between the 15th – 25 of each month and reports will be submitted using supplied templates within 10 days of observation.* The monitoring report will include observations from specified locations around the lake highlighting water clarity, invasive species, algae, wildlife, spillway depth, maintenance and restoration opportunities, and photographs. In addition, significant water quality problems identified during monitoring will be reported immediately to the appropriate officials including the city's Stormwater Compliance Officer. **($412.50)**

July 1 - September 30, 2014

A monitoring report for August was completed and submitted.

January 1 - March 31, 2015

A monitoring report for January was completed and submitted.

Contract Administration

Total Allocated Cost: $1220

Quarterly progress reports and invoices will be submitted in accordance with the following provisions: *Quarterly reports and invoices are due within 10 days of the quarter end date and will follow templates and instructions set forth by Stormwater Services.* Reports and invoices that do not follow templates/instructions will be returned for correction; payment will be processed once updated reports and invoices are received, reviewed, and approved.

Submit cumulative quarterly progress reports and invoices according to the following quarters: July 1 - Sept 30; October 1 - Dec. 31; January 1 -March 31; April 1 - June 30. The 4th quarter progress report will serve as a compiled year end summary report.

The quarterly invoice should use the supplied template which shows the % of each service completed each quarter, invoice amount, and amount remaining to be paid. Invoices will be paid once quarterly progress report and invoice are received and reviewed by the City for adequate progress. Non-performance or inadequate progress may result in non-payment. No pre-payment of services will occur.

CFRW will maintain all records and reports *(ie. annual contract, quarterly reports, quarterly invoices, monitoring reports, cleanup reports, Watershed Watch reports, educational activities, educational print materials, permissions, media notices, etc)* related to this contract on a fiscal year basis (July 1-June 30). These records should be retained for a period of at least 5 years. In addition, an annual compilation CD or DVD copy will be provided to the City of Wilmington Stormwater Services by July 10th for the prior FY. These files are public record and should be made accessible.

Contact person: Stormwater Services requires one main point of contact for the implementation, management, communication, and reporting of this annual contract. This staff person will be the individual that implements the majority of contract services, and therefore will be the most familiar with the contract. The designated contact person is: Kay Lynn Hernandez **($1220)**

Other:

Do not assign a cost.

Assist Stormwater Services in implementing additional public outreach, education, involvement, and participation activities required by federal NPDES stormwater permit. Summary reports and information will be included in the City's NPDES yearly report to the State.

Report compiled by: Kay Lynn Hernandez **Date: 7/9/2015**

NEW HANOVER SOIL & WATER CONSERVATION DISTRICT
230 Government Center Drive, Suite 100
Wilmington, NC 28403

Quarterly Progress Report #4: April 1- June 30, 2015

New Hanover Soil & Water Conservation District (NHSWCD), under contract with the City of Wilmington Stormwater Services, will provide the following services for the time period consistent with the City's fiscal year from **July 1, 2014** through **June 30, 2015** for the agreed amount of **$24,182.** These contracted services, implemented as equitably as possible throughout the fiscal year, assist the City in meeting requirements of the federal NPDES Stormwater Permit.

Public Education/Outreach

Total Allocated Cost: $13,250

Conduct Enviroscape Presentations for at least 1/3 of 8th grade science classes in New Hanover County Schools each semester for the entire school year. The Enviroscape presentation is an integral component of the 8th grade science curriculum in New Hanover County Schools. Presentations will be done in coordination with other environmental agencies and will focus on the specific NC Essential Standard and Objectives for the Hydrosphere unit. Enviroscape instructors will be trained, certified, and follow all applicable Enviroscape policies and procedures as set forth by the City of Wilmington Stormwater Services. A maximum of 3 trained Enviroscape instructors from each agency (which includes the Enviroscape supervisor) are permitted to deliver presentations in 8th grade. Additional presentations should not conflict or duplicate the 8th grade presentations in any fashion. Other efforts may include assisting with curriculum development, scheduling presentations, teacher relations, and training instructors. **($1987.50)**

July 1 - September 30, 2014

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**
9/25/2014	Roland Grise Middle School	8	2	53
9/29/2014	Virgo Middle School	8	2	40

October 1-December 31, 2014

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**
11/4/14	Holly Shelter MS	8th	3	74
11/7/14	Holly Shelter MS	8th	1	22
11/20/14	Trask MS	8th	2	50

January 1 – March 31, 2015

8th Grade Enviroscape Presentations

Date	School	Grade	# of presentations	# of students
2/17/2015	Noble Middle	8th	1	27
2/23/2015	Noble Middle	8th	2	60

Attended scheduling meeting for all instructors in January to coordinate new spring schedule.

April 1–June 30, 2015

8th Grade Enviroscape Presentations				
Date	**School**	**Grade**	**# of presentations**	**# of students**
4/29/2015	Murray Middle	8th	2	50
5/11/2015	Myrtle Grove Middle	8th	3	70
5/12/2015	Myrtle Grove Middle	8th	5	100
5/13/2015	Williston Middle	8th	2	55

Increase awareness and education in the city about pet waste/fecal coliform bacteria.
Implement education about pet waste, fecal bacteria, the city's pet waste ordinance, and solutions. Provide outreach and education materials via K-12 education programs, public meetings, agency website, and by participating/staffing the Canines for Clean Water (C4CW) booth at a minimum of 3 pet-related events (with pets present at a minimum of 2 events). The expectation is to target well-attended events. **($1325)**

July 1 - September 30, 2014

Distributed information about pet waste at NHC Vendor Fair event to NHC teachers.

October 1-December 31, 2014

Pet Events				
Date	**Event**	**Location**	**Method of Delivery/Materials/Theme/Etc.**	**# signed Pet Waste pledges**
10/25/14	NHC Animal Services-Free Rabies Shot clinic	Animal Control, Division Drive	C4CW display table and pledge signatures acquired	80

Booked participation in Pawz in the Park pet event in upcoming quarter. Distributed information about pet waste at Cape Fear Fair and Expo event.

January 1 – March 31, 2015

Pet Events				
Date	**Event**	**Location**	**Method of Delivery/Materials/Theme/Etc.**	**# signed Pet Waste pledges**
3/21/2015	NHC Animal Services-Free Rabies Shot clinic	Animal Control, Division Drive	C4CW display table and pledge signatures acquired	50

Distributed information about pet waste at Media Conscience Fair and LCFSDC Luncheon events.

April 1 – June 30, 2015

Pet Events				
Date	**Event**	**Location**	**Method of Delivery/Materials/Theme/Etc.**	**# signed Pet Waste pledges**
4/18/2015	Pawz in Park	Battleship Park	C4CW display table and pledge signatures acquired	45

Distributed information about pet waste at Wilmington Earth Day Festival, Lakefest, and Bellamy Mansion events.

Conduct at least 2 "Stormwater 101" presentations to HOAs, garden clubs, community/civic groups, developers, or during watershed-wide meetings. A maximum of 1 presentation may target university or college classes/students. Initiate direct contact with potential audiences, promote program, and schedule presentations. **($662.50)**

April 1 - June 30, 2015

Stormwater 101 Presentations			
Date	**Organization/Audience**	**Method of Delivery/Materials/Etc.**	**Attendance**
6/25/15	PPD Toastmasters	Stormwater 101 power point presentation. Raffled off 60 gallon rain barrel to audience member.	30
6/27/15	Painting with a Twist	Stormwater 101 power point presentation. Raffled off $25 Lowes gift card to audience member.	5

Participate in local annual community outreach events. NHSWCD will attend and provide BMP, stormwater, and rain barrel sale information at three community outreach events (such as the Annual Earth Day Festival, Cape Fear Fair and Expo, and/or the Wilmington Garden Show). NHSWCD may also assist with TreeFest, an annual program which distributes tree saplings to New Hanover County citizens **($2650)**

July 1 - September 30, 2014

Community Outreach Events				
Date	**Event**	**Location**	**Method of Delivery/Materials/Theme/Etc.**	**Attendance**
8/22/2014	NHCS Vendor Fair	Ashley HS	Educational display, handouts, demonstrations	3000
9/27/2014	Operation Medicine Drop	NHRMC Medical Mall	Assisted with obtaining medicines from residents to prevent these medications from being flushed and entering waterways. Coordinated recycling of all plastics (bottles and lids) and all paper products (boxes and inserts).	635

Booked participation in Cape Fear Fair and Expo event in upcoming quarter. Also booked participation in Fire in the Pines Festival in upcoming quarter.

October 1-December 31, 2014

Community Outreach Events				
Date	**Event**	**Location**	**Method of Delivery/Materials/Theme/Etc.**	**Attendance**
10/11/14	Fire in the Pines Festival	Halyburton Park	Display/Booth regarding District programs. Educated attendees on reducing non-point source water pollution.	200
10/31/14-11/9/14	Cape Fear Fair and Expo	Fair Grounds at NHC Airport	Display/Booth regarding District programs as it relates to Agriculture. Reducing non-point source water pollution as it relates to all programs was also displayed. Display won 1st place and Best in Show.	10,000+
12/5/14	Science Fair Judging	Codington ES	Volunteered as a judge for Codington's elementary science fair projects	30

Staff has attended two regular meetings for the Earth Day Festival. Staff is currently working with Parks Conservancy Board to have the 501c3 license reinstated as well as working on preparation for the upcoming festival.

January 1- March 31, 2015

Community Outreach Events				
Date	**Event**	**Location**	**Method of Delivery/Materials/Theme/Etc.**	**Attendance**
1/17/15	Cape Fear River Watch Striper Fest	Coastline Convention Center	Assisted in activities geared toward children to help learn about water quality and local water issues.	400
1/22/15	New Hanover County Science Fair	Ashley High School	Assisted in judging student science fair projects at the county level. Also awarded student with NHSWCD award based on project closest to NHSWCD mission.	150
1/23 & 1/24/2015	TreeFest	Independence Mall	Worked the two day event, which provides free seedling and grassplugs to residents to help control soil erosion and improve water quality as a result.	1000
2/7/2015	StarNews Media Conscience Fair	CFCC Union Station	Participated in a public education event about local non-profits/organizations and potential volunteer opportunities	1000
2/19/2015	LCFSDC Awards Luncheon	Terraces at Sir Tyler	Staff set up a display table to inform attendees of District roles/programs as well as stormwater information and programs.	125
3/17/2015	Coastal Envirothon	Cool Springs Education Center	Staff provided support for participating teams. Three local teams from Hoggard High School attended, participated and advanced to the state level.	300

April 1 – June 30, 2015

Community Outreach Events				
Date	**Event**	**Location**	**Method of Delivery/Materials/Theme/Etc.**	**Attendance**
4/22/2015	UNCW Green Careers Fair	UNCW	Educational display, internship information, handouts	50
4/25/2015	Wilmington Earth Day Festival	Hugh MacRae Park	Worked the 1-day event, including set-up, breakdown, and logistics throughout the day. Also set up a display booth regarding District programs.	2500
5/2/2015	CFRW LakeFest	Greenfield Lake	Display/booth regarding District programs. Booth activities geared toward children to help learn about water quality and local water issues	30
6/7/2015	Bellamy Mansion "Water, Water, Everywhere"	Bellamy Mansion	Participated in a public education event about rain water collection and promoted the rain barrel sale and stormwater reduction education.	125

Promote/consult on Low Impact Development (LID) including stormwater Best Management Practices (BMPs) to developers, engineers, architects, property owners, HOAs, etc. Promote BMPs, LID, and the local LID manual, provide input to City and NHC Technical Review Committees, as well as provide education and technical assistance as the need arises for property owners. **($662.50)**

July 1 - September 30, 2014

Provided comments for 7 submittals to the New Hanover County Technical Review Committee (TRC) and three City of Wilmington TRC. Comments include soil types as well as BMPs and Low Impact Development (LID) practices that could be placed in the area being developed.

October 1-December 31, 2014

Provided comments for 4 submittals to the New Hanover County TRC and 2 for City of Wilmington TRC. Comments included soil types as well as BMPs and LID practices that could be placed in the area upon development.

January 1- March 31, 2015

Provided comments for 5 submittals to the New Hanover County TRC and 3 for City of Wilmington TRC. Comments included soil types as well as BMPs and LID practices that could be placed in the area upon development.

April 1- June 30, 2015

Provided comments for 4 submittals to the New Hanover County TRC and 3 for City of Wilmington TRC. Comments included soil types as well as BMPs and LID practices that could be placed in the area upon development.

Facilitate additional environmental education presentations in the community that highlight stormwater issues for local residents, students, teachers, camps, business owners, etc. Topics include, but are not limited to, natural resource management, sustainability, wildlife, the development of a school BMP/outdoor educational center, etc. Presentation topics will tie into water quality and conservation issues. **($2650)**

July 1 - September 30, 2014

Environmental Education Presentations					
Date	**School/Audience**	**Grade**	**Topic/Activity**	**# presentations**	**Attendance**
7/30/2014	Wrightsville Beach Surf Camp	K-2	Water Pollution/Enviroscape	1	15
8/6/2014	Wrightsville Beach Surf Camp	K-2	Water Pollution/Enviroscape	1	12
8/7/2014	Childcare Network Presentation	PreK-5	Trees/natural resource management	1	20
8/14/2014	Wrightsville Beach Surf Camp	K-2	Water Pollution/Enviroscape	1	15
9/22/2014	Castle Hayne Elementary	1	Soil and earthworms	2	57
9/23/2014	Castle Hayne Elementary	1	Soil and earthworms	2	46
9/25/2014	Anderson Elementary	3	Soil and plants	3	70
9/26/2014	Anderson Elementary	3	Soil and plants	2	45

Staff conducted a county-wide survey of teachers/administration to determine school interest in OELCS. Survey results will be used in moving forward with future OELC developments.

October 1-December 31, 2014

Environmental Education Presentations					
Date	**School/Audience**	**Grade**	**Topic/Activity**	**# presentations**	**Attendance**
10/9/14	Middle School Science Leads	6-8	All District Programs for Students	1	8
11/12/14	Eaton ES	3rd	Soil and Plants	3	66
11/17/14	Anderson ES	3rd	"Wetlands are Wonderful"	5	104
11/19/14	Castle Hayne ES	4th	Erosion and Weathering	3	105
12/2/14	Hoggard HS	9th	"Wetlands are Wonderful"	2	67
12/5/14	Winter Park ES	3rd-5th	Enviroscape for Green Team	1	34
12/18/14	Holly Shelter MS	6th	Erosion and Weathering	4	121

January 1-March 31, 2015

Environmental Education Presentations

Date	School/Audience	Grade	Topic/Activity	# presentations	Attendance
1/27/15	Pine Valley ES	5th AIG	"Wetlands are Wonderful"	1	20
1/28/15	Pine Valley ES	5th AIG	"Wetlands are Wonderful"	1	20
1/30/15	Pine Valley ES	4th	"Wetlands are Wonderful"	4	100
2/5/15	Pine Valley Elementary	3rd AIG	"Wetlands are Wonderful"	1	20
2/27/15	WAAS	7th	'Wetlands" speech contest judging	1	20
3/26/15	Island Montessori	4th-6th	Enviroscape	1	25

April 1-June 30, 2015

Environmental Education Presentations					
Date	**School/Audience**	**Grade**	**Topic/Activity**	**# presentations**	**Attendance**
4/21/2015	Myrtle Grove Middle	6th	Soil and Plants	2	75
6/16/2015	Childcare Network	PreK-K	Water/Trees	2	25
6/17/2015	Wrightsville Beach Surf Camp	K-3	Water Pollution/Enviroscape	1	15
6/24/2015	Childcare Network	K-5	Water	1	15
6/24/2015	Wrightsville Beach Surf Camp	K-3	Water Pollution/Enviroscape	1	15

Organize/facilitate at least 2 Environmental Field Days a year serving an entire grade at a New Hanover County School. Provide Envirothon competition information and guidance to teachers and interested student organizations. Envirothon topics include aquatics/water quality, soils/erosion, forestry, wildlife, and other environmental issues. **($1987.50)**

July 1 - September 30, 2014

Staff has coordinated and organized two middle school field days and one elementary school field day. These presentations are scheduled during the next quarter of reporting.

October 1-December 31, 2014

Environmental Field Day					
Date	**School/Audience**	**Grade**	**Topic/Activity**	**# presentations**	**Attendance**
10/22/14	Trask MS	6th	Soils/Aquatics/Wildlife/Forestry/Eco-Tour	5 of each	120
10/24/14	Trask MS	6th	Soils/Aquatics/Wildlife/Forestry/Eco-Tour	5 of each	120
10/29/14	Virgo MS	6th	Soils/Aquatics/Wildlife/Plants	4 of each	60
11/3/14	Pine Valley ES	4th	Soils/Aquatics/Wildlife/Plants	4 of each	81
11/5/14	Pine Valley ES	5th	Soils/Aquatics/Wildlife/Plants	4 of each	80

January 1 – March 31, 2015

Environmental Field Day					
Date	**School/Audience**	**Grade**	**Topic/Activity**	**# presentations**	**Attendance**
3/20/15	Carolina Beach ES	4th	Soils/Aquatics/Wildlife/Forestry	4 of each	63
3/24/15	Carolina Beach ES	4th	Soils/Aquatics/Wildlife/Forestry	4 of each	57

Update and maintain agency website and social media outlets including materials related to stormwater education. The website will also provide links to stormwater education materials in Spanish in an effort to reach more minorities in our region. NC Community Conservation Assistance Program (CCAP) and HOWBMP project pictures will continue to be labeled and

updated and a map showing CCAP and other BMP projects will be updated and available on the website. The city's Report Stormwater Pollution hotline and online reporting form will be promoted and linked from the NHSWCD website. The NHSWCD website will be promoted on local government TV and social media outlets. The NHSWCD agency website may be integrated into the redeveloped New Hanover County website in the future. **($1325)**

October 1-December 31, 2014

Staff and Supervisor changes were updated and the calendar underwent continual updates with events and public programs/meetings.

January 1 - March 31, 2015

Checked website links for function as well as check Stormwater Services partner information for accessibility.

April 1 – June 30, 2015

Worked with NHC IT to install GIS software on computer in order to create map of BMPs in NHC. Scheduled to take a class to enhance skills with software. HOW BMP picture were posted to the organization website.

Public Involvment/Volunteer Efforts

Total Allocated Cost: $994

Encourage public involvement by engaging city residents/businesses/civic groups in a volunteer Storm Drain Marking program in the city to educate the community about stormwater pollution. A minimum of 2 separate volunteer days is required. For each outing day, a minimum of 7 markers will be applied per volunteer group and educational doorhangers will be distributed to surrounding residences/businesses. Staff will assist in identifying areas to mark drains, educate volunteers about stormwater and the purpose of the program, train volunteers in marking and safety, use supplied markers, and help provide oversight of the program. A trained NHSWCD staff member is required to be present during all storm drain marking activities and with each volunteer group. **($994)**

April 1-June 30, 2015

Storm Drain Marking			
Date	**Name of Volunteer Organization, Business, etc.**	**Volunteers**	**Area Marked & # of Storm Drains Marked**
May 30, 2015	UNCW Sustainability	4	Windchime Drive and Rounding Bend Lane. 7 drains marked
May 30, 2015	Backyard Naturalist Program	4	Windchime Drive and Longmeadow Drive. 7 drains marked

Programs/Partnerships

Total Allocated Cost: $5,963

Administer the NC Community Conservation Assistance Program (CCAP) in New Hanover County. Provide assistance with the demonstration, purchase, installation and monitoring of stormwater Best Management Practices (BMPs) for City/County residents and businesses. Activities may include identifying new BMPs and standards, updating BMP cost estimates, developing conservation plans and maintenance agreements for CCAP clients, assisting with the design and/or installation of stormwater BMPs, managing CCAP BMP project sites, and conducting annual spot checks. In addition, NHSWCD staff will promote CCAP through agency

website, educational programs, publications, public/local government television, and to interested groups. NHSWCD will also continue to update the watershed map of CCAP BMPs installed/cost-shared by the district in the county and post map on agency website. **($2385)**

July 1 - September 30, 2014
Conducted one site visit for potential CCAP applicant. Applicant is interested in a Cistern on a residential site. Also attended two statewide CCAP advisory committee meetings. Advisory committee meetings are held bi-monthly to discuss rule changes and modifications to the state program. Also attended one CCAP TRC where a new BMP of oyster reefs was presented and discussed.

October 1-December 31, 2014
Conducted three site visits. Once site is for pervious pavement, one site is for a cistern and one site is for a rain garden. Four applications for CCAP funding were presented to the NHSWCD Board of Supervisors. All applications were approved. The site for pervious pavement ranked the highest and will receive first round CCAP funds. A second round of funding will come to the District in January. Staff also attended three statewide CCAP standing committee/subcommittee meetings to discuss future funding, allocation, and program updates.

January 1 – March 31, 2015
Conducted additional site visit for the permeable pavement project/contract. Staff also attended one state standing committee meeting regarding future funding of the statewide CCAP program in an effort to try to increase efforts to push for greater funding in the future.

April 1-June 30, 2015
Completed FY 15-16 strategy plan for state partner in which funding needs are presented for CCAP projects in upcoming year. Also applied for an EPA 319 grant for Futch, Pages, and Howe Creek watersheds. Funding was not approved, but NHSWCD was encouraged to write a more detailed watershed restoration plan for these watersheds and reapply next year.

Administer and partner with the City of Wilmington Stormwater Services to hold a public rain barrel sale. NHSWCD will utilize local government television, local events including Earth Day and the Cape Fear Garden Show, agency website, outdoor signage (day of), and periodic press releases to the media to promote the sale. Rain barrel buyers will be asked to give their watershed location in order to educate them about watersheds and record volume reduction for the Heal Our Waterways Bradley/Hewletts Creek watershed restoration effort. **($1193)**

July 1 - September 30, 2014
7/10/14: 3 Short Stack, 4 Tall Stack
8/14/14: No sales
9/11/14: 1 Tall Stack

October 1 - December 31, 2014
10/9/14: 1 Tall Stack
11/13/14: No sales
12/15/14: 1 Tall Stack

January 1 - March 31, 2015
1/2015: No sales
2/2015: 1 Tall Stack
3/2015: 4 Tall Stack

April 1 – June 30, 2015
4/2015: 4 Short Stack, 4 Tall Stack
5/2015: 8 Short Stack, 3 Tall Stack
6/2015: 2 Short Stack, 4 Tall Stack

Serve as an integral partner to facilitate the Lower Cape Fear Stewardship Development Award Program. Also serve as an active partner organization on other local grant projects or initiatives that benefit local surface water quality and water resources. The Stewardship Development program recognizes developers for demonstrating outstanding environmental stewardship such as stormwater reduction and LID practices through the protection and awareness of our natural resources. **($2385)**

July 1 - September 30, 2014
Attended Lower Cape Fear Stewardship Development Coalition (LCFSDC) meeting 9/10/14. Completed annual financial report for committee for FY 13-14. Met with LCFSDC CPA to confirm all the correct measures for a non-profit were being taken at this time and current with NC laws.

October 1-December 31, 2014
Staff attended three regular committee meetings of LCFSCD, as well as the judging day for the 2014 applicants. Four applicants applied this year. Two will receive Significant recognition and two will receive Outstanding recognition.

January 1 - March 31, 2015
Staff attended three regular committee meetings of LCFSCD, as well as the awards luncheon and educational training on February 19, 2015. Staff also filed with the state of NC to be the designated agent for the LLC status held.

April 1 – June 30, 2015
Staff attended three regular committee meetings of LCFSCD, as well as completed nominations for the new board of officers for FY 15-16. Potential projects for the new FY 15-16 were also discussed at the last full meeting.

Monitoring Activities

Total Allocated Cost: $ 1,325

Serve as the lead agency for managing land conservation easements in the Hewletts Creek Watershed and other potential sites. Annually monitor currently held conservation easements, and provide educational contact with residents in the Hewletts Creek Watershed. In addition, NHSWCD will work with organizations/groups to provide stormwater education programs at the J.E.L. Wade Stormwater Wetland, as the need arises. **($1325)**

April 1 – June 30, 2015

Education Presentations				
Date	**Audience / Topic**	**Grade**	**# presentations**	**# of students**
6/17/15	Wade Wetland Education Presentation to Cape Fear Community College Sustainability Class	College	1	12

Completed easement checks on all property in Hewletts Creek Watershed 5/21/15. All easement areas were un-disturbed and maintained. District staff also distributed the "Changing Tides" newsletter to residents surrounding the easement area.

Contract Administration

Total Allocated Cost: $2650

Quarterly progress reports and invoices will be submitted in accordance with the following provisions: Quarterly reports and invoices are due within 10 days of the quarter end date and will follow templates and instructions set forth by Stormwater Services. Reports and invoices that do not follow templates/instructions will be returned for correction; payment will be processed once updated reports and invoices are received, reviewed, and approved.

Submit cumulative quarterly progress reports and invoices according to the following quarters: July 1 - Sept 30; October 1 - Dec. 31; January 1 -March 31; April 1 - June 30. The 4th quarter progress report will serve as a compiled year-end summary report.

The quarterly invoice should use the supplied template which shows the % of each service completed each quarter, invoice amount, and amount remaining to be paid. Invoices will be paid once quarterly progress report and invoice are received and reviewed by the City for adequate progress. Non-performance or inadequate progress may result in non-payment. No pre-payment of services will occur.

NHSWCD will maintain all records and reports related to this contract on a fiscal year (FY) basis (July 1-June 30). These records should be retained for a period of at least 5 years. In addition, an annual compilation CD or DVD copy of all contract documents, records, reports, invoices, and pertinent educational materials will be provided to the City of Wilmington Stormwater Services by July 10th for the prior FY. These files are public record and should be accessible.

Contact person: Stormwater Services requires one main point of contact for the implementation, management, communication, and reporting of this annual contract. This staff person will be the individual that implements the majority of contract services, and therefore will be the most familiar with the contract. The designated contact person is: **Dru Harrison. ($2650)**

Other:

Do not assign a cost.

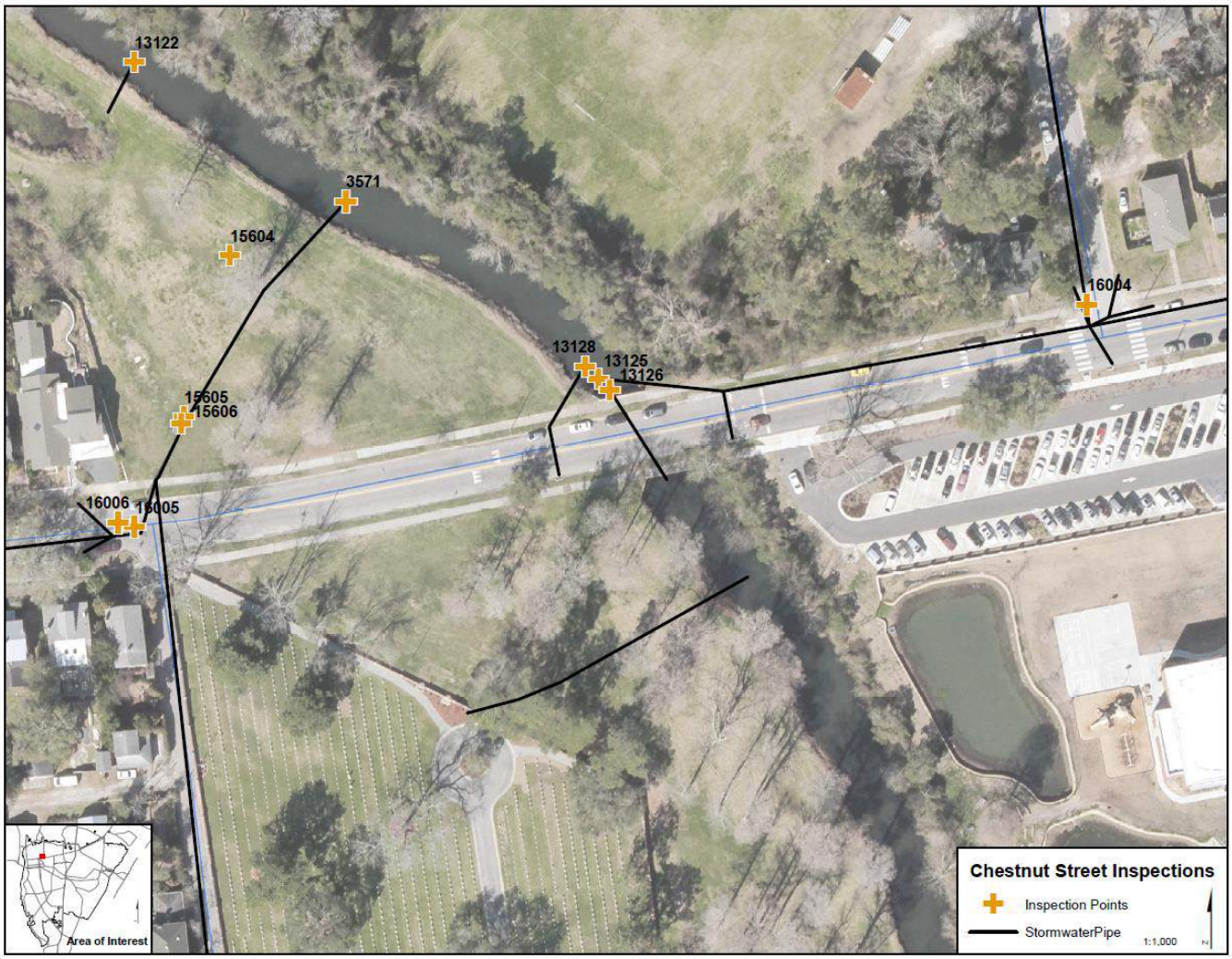
Assist Stormwater Services in implementing additional public outreach, education, involvement, and participation activities required by federal NPDES stormwater permit. Summary reports and information may be included in the City's NPDES yearly report to the State.

Report compiled by: Dru Harrison **Date:** 7/7/15

APPENDIX D: ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE)

Dry Weather Flow Monitoring Location Maps

Drainage Segment Location *(description)*
30" outfall just north of Chestnut St. on Burnt Mill Cr., southwestward to Chestnut St., westward to 16th St.



Drainage Segment Location *(description)*
54" outfall at Greenfield St./S.Front St. intersection, northward to Martin St. and Kidder St., eastward (if needed)

Drainage Segment Location *(description)*
Princess Place Dr. at Burnt Mill Cr. - outfalls at BM Cr. Southward along creek to Chestnut St.

OBJECTID	INSPECTION DATE	INSPECTOR	ILLICIT DISCHARGE	OBSERVATION	DESCRIPTION
3555	5/19/2015	SASKIA COHICK	NO INDICATION	NA	No flow
3557	5/19/2015	SASKIA COHICK	NO INDICATION	NA	Hidden in overgrown vegetation
3558	5/19/2015	SASKIA COHICK	NO INDICATION	NA	No flow
3571	5/19/2015	SASKIA COHICK	NO INDICATION	NA	No flow
3604	5/19/2015	SASKIA COHICK	NO INDICATION	NA	
4456	5/6/2015	SASKIA COHICK	NO INDICATION	LITTER	Turtles and Fish
4458	5/6/2015	SASKIA COHICK	NO INDICATION	LITTER	
4459	2/9/2015	GRACE MORRISON	NO INDICATION	ALGAE	Murky
4461	2/14/2015	SASKIA COHICK	NO INDICATION	NA	
4462	2/9/2015	GRACE MORRISON	NO INDICATION	NA	
8961	2/14/2015	SASKIA COHICK	NO INDICATION	LITTER	Many juvenile fish
13122	5/19/2015	SASKIA COHICK	NO INDICATION	NA	
13123	5/19/2015	SASKIA COHICK	NO INDICATION	NA	
13125	5/19/2015	SASKIA COHICK	NO INDICATION	NA	
13126	5/19/2015	SASKIA COHICK	NO INDICATION	NA	
13128	5/19/2015	SASKIA COHICK	NO INDICATION	NA	
13531	2/14/2015	SASKIA COHICK	NO INDICATION	DEBRIS	Bark debris, full
13559	2/9/2015	SASKIA COHICK	NO INDICATION	NA	No flow
13560	2/9/2015	SASKIA COHICK	NO INDICATION	NA	slightly cloudy
13563	2/14/2015	SASKIA COHICK	NO INDICATION	NA	No flow
13564	2/14/2015	SASKIA COHICK	NO INDICATION	NA	
13580	2/14/2015	SASKIA COHICK	NO INDICATION	NA	
14370	5/19/2015	SASKIA COHICK	NO INDICATION	OTHER	New outflow point not in inventory, no flow
15204	5/6/2015	SASKIA COHICK	NO INDICATION	DEBRIS	dry
15205	5/6/2015	SASKIA COHICK	NO INDICATION	DEBRIS	brick lined structure, no flow,
15206	5/6/2015	SASKIA COHICK	NO INDICATION	DEBRIS	dry
15207	5/6/2015	SASKIA COHICK	NO INDICATION	NA	dry
15208	5/6/2015	JIM QUINN	NO INDICATION	DEBRIS	mulch
15209	5/6/2015	GRACE MORRISON	NO INDICATION	DEBRIS	dry
15210	5/6/2015	GRACE MORRISON	NO INDICATION	NA	dry
15604	5/19/2015	SASKIA COHICK	NO INDICATION	OTHER	has standing water but audible water
15605	5/19/2015	SASKIA COHICK	NO INDICATION	NA	ground water seeping into junction box at seam
15606	5/19/2015	SASKIA COHICK	NO INDICATION	NA	standing water in pipe, no flow
16004	7/9/2015	JIM QUINN	NO INDICATION	NA	
16005	7/9/2015	JIM QUINN	NO INDICATION	NA	
16006	7/9/2015	JIM QUINN	NO INDICATION	NA	

Employee Training

Employee training was conducted for Engineering Department (Construction Inspectors) on September 23, 2014. In addition, new employee training material and presentations have been discussed as part of an on-boarding process when new hires start in their respective positions with the City. Training material for these new employees is planned for implementation during the upcoming reporting period. Refresher training and education for existing staff will be updated as necessary and implemented every 1-2 years.

City of Wilmington
Stormwater Services Employee Training
Sign-In Sheet

Topic: Illicit Discharge Detection and Elimination
Location: Engineering Conference Room
Date: September 30, 2014
Time: 7:45 – 8:45

Employee		Employee	
1.	Skipper Fundaburk	18.	
2.	Bret Russell	19.	
3.	Aaron McLamb	20.	
4.	Howl Asbury	21.	
5.	Randy Allen	22.	
6.	Keith DeLoatch	23.	
7.	Jim Whitehurst	24.	
8.	Todd Gentinetta	25.	
9.		26.	
10.	Mike Naklicki	27.	
11.	Zac Green.	28.	
12.		29.	
13.		30.	
14.		31.	
15.		32.	
16.		33.	
17.		34.	

Policy for Reporting and Documentation of Sanitary Sewer Overflows and System Leaks

Cape Fear Public Utility Authority and City of Wilmington

Purpose:

The purpose of this document is to establish agreed upon procedures for the Cape Fear Public Utility Authority (CFPUA) to follow regarding reporting and documentation of sanitary sewer overflows (SSO) that impact the City of Wilmington Municipal Separate Storm Sewer System (MS4). These guidelines will enable the City to comply with NPDES Phase II Stormwater permit reporting requirements as well as to provide assistance to CFPUA in mitigating any potential threat to public health or the environment.

Reporting Requirements:

All SSOs resulting in discharge to the City of Wilmington MS4, or causing possible contamination of stormwater discharging to the storm system, must be reported to the City within 48 hours of occurrence in accordance with City Code Chapter 12, section 12-24. Failure to comply may result in a notice of violation (NOV) for the CFPUA. Fines for non compliance range up to $10,000 based on quantity, risk to the public, environment damage and degree of negligence as documented in the City Code. The following table documents the minimum information required for sanitary sewer overflows and sewage leaks that may impact the City's MS4.

	Date of Spill/Leak	Location	Volume	Corrective Action	NCDWQ Form	Analytical Data
SSO						
< 1000 gal	x	x	x	x		
> 1000 gal	x	x	x	x	x	x
System Leak	x	x	x	x	x	as needed

Spills greater than 1,000 gallons require an additional completed copy of the DWQ's Collection System Sanitary Sewer Overflow Reporting Form (CS-SSO) provided at the same time as when provided to the State. Failure to comply may result in an NOV for CFPUA. Clean up requirements are in accordance with the CFPUA's Clean up Procedure Policy. This information will also be used in documenting the compliance with the City of Wilmington's annual NPDES Phase II Stormwater report to NCDWQ.

City of Wilmington Contact Information:

Spills less than 1,000 gallons

Use the Pollution Prevention Hotline: 910-341-1020
Or go to: www.wilmingtonnc.gov/reportstormwaterpollution and fill out the on line form.

Spills greater than 1000 gallons or system leaks

1) Beth Nunnally
Stormwater Compliance Officer
910-341-0092
beth.nunnally@wilmingtonnc.gov

2) Jim Quinn
Stormwater Specialist
910-341-4694
Jim.quinn@wilmingtonnc.gov

3) Jim Conlon
Drainage Manager
910-341-4646
jim.conlon@wilmingtonnc.gov

4) David Mayes
Stormwater Services Manager
910-341-5880
Dave.Mayes@wilmingtonnc.gov

(From Page 8 of City of Wilmington Illicit Detection and Elimination Program Manual)

Dry Weather Flow Inspection Program

In accordance with permit requirements for detecting dry weather flows, the City is developing and implementing a program for conducting inspections throughout the MS4 to detect dry weather flows. Dry weather flows are defined as any flow in the MS4 that occurs after a 72 hour period without rain. The objective is to identify and eliminate flows that contain pollutant or pathogen loads. Such flows vary in source, content, and frequency, thereby imparting variable impacts within the larger MS4 and the final receiving water bodies. Promptly identifying dry weather flows is instrumental in recognizing and addressing deleterious illicit discharges. As the program develops, procedures will be evaluated and modified with the aim of more effectively detecting and eliminating illicit discharges.

Employees of the City familiar with outfall inspection procedures will conduct the inspections. Inspections will be conducted only during dry periods to facilitate identification of only those flows unassociated with allowable stormwater flows. Furthermore, those outfalls located along tidally influenced reaches will be inspected at low tide; should the outfall still be submerged at low tide, the stormwater conduit will then be traced upgrade to the nearest manhole or observable location beyond tidal influence, where an inspection will be more likely to detect a dry weather flow. A similar modified observation procedure will be used for those points where direct inspection of the outfall point is not possible; observations will be made immediately upgrade in the system at an appropriate location for dry weather inspection.

The inspection itself will consist of an initial visual inspection of the outfall to determine the presence or absence of water or liquid flow. Photographs will be taken of the inspection location and saved along with the inspection record containing data describing the conditions observed at the outfall or observation point. . The detection of any suspicious dry weather flow will prompt a service request for a field screening as described in later sections of this manual outlined as Steps 1-4, in which physical, chemical, and biological parameters may be analyzed to determine the nature and source of any illicit discharge.

The inspection records will be stored in the GIS as tables. Screen shots of the actual ArcPad routine and a diagram showing the database designed for storing these records is shown in Appendix E: *Field Data Collection of Dry Weather Inspections using ArcPad.*

Given that the City is located in a coastal area with tidal influence in parts of the MS4 and numerous groundwater sources infiltrating or directly routed into the MS4, our strategy for performing the observations will be adjusted accordingly. The initial location of all major outfall points has provided the starting point for the Dry Weather Flow Inspection Program. Each of the major outfall points will be inspected, photographed and have an observation record saved to the GIS database as described above. Following completion of this effort, a similar systematic inspection of major trunk lines and areas of interest will begin.

The selection of major trunk lines for inspection will be a strategically targeted effort to isolate those portions of the drainage system that may be contributing to any dry weather flow. At this point, we envision inspections progressing up a selected trunk line from the outfall so that any contributing dry weather flow source areas can be identified and investigation into the source can begin. MS4 structures which have sewer cross pipes associated with them are at the greatest risk for sewage contamination; therefore along with the trunk line inspection effort, special attention will be given to inspecting any MS4 structures or junctions which have a sewer cross pipe passing through the structure. Any identified illicit discharge encountered during the both the trunk line and sewer cross pipe inspection process will result in a service request being generated.

The selection of major trunk lines and points along the trunk line for inspection will be scheduled with consideration given to several influencing factors including: weather conditions, the degree to which stormwater infrastructure mapping is reliable and complete within a given area, suspicion of negative inputs to the MS4 based upon annual water quality reports, 303d listings, and/or industrial land use designations. Also, indications of illicit discharge observations from the MS4 mapping crew will prompt inspections. Dry weather inspections will be performed at a minimum of four locations along one or more trunk lines during any given month depending on weather conditions.

APPENDIX E: CONSTRUCTION SITE RUNOFF CONTROLS

Included in this section:

New Hanover County Erosion & Sedimentation Control Ordinance

New Hanover County Ordinance:

The following are excerpts culled from the New Hanover County Erosion and Sedimentation Control Ordinance:

The New Hanover County erosion and sedimentation control ordinance is adopted for the purposes of:

(1) Regulating certain land disturbing activity to control accelerated erosion and sedimentation in order to prevent the pollution of water and other damage to lakes, watercourses, and other public and private property by sedimentation; and

(2) Establishing procedures through which these purposes can be fulfilled.

General requirements of the permit include among others:

(a) *Plan required.* No person shall initiate any land disturbing activity which uncovers more than one acre without having an erosion control plan approved by the county. No land disturbing activity may be initiated until the county is notified of the date that the land disturbing activity will begin.

(b) *Protection of property.* Persons conducting land disturbing activity shall take all reasonable measures to protect all public and private property from damage caused by such activity.

(c) *More restrictive rules shall apply.* Whenever conflicts exist between federal, state, or local laws, ordinances, or rules, the more restrictive provision shall apply.

(e) *Inspections.* Any and all applicable intermediate inspections may be held in any trade (building, mechanical, electric and/or plumbing) if any land disturbing activity, on a tract, including single-family residences, is found not to be in compliance with any part of this article.

(f) *Building finals.* Building finals and/or certificates of occupancy may not be issued if any land disturbing activity, including single-family residences, is found not to be in compliance with any part of this article.

Mandatory Standards For Land Disturbing Activity

No land disturbing activity subject to the control of this article shall be undertaken except in accordance with the following mandatory standards:

(1) *Buffer zone*.

a. No land disturbing activity during period of construction or improvement to land shall be permitted in proximity to a lake or natural watercourse unless a buffer zone is provided along the margin of the watercourse of sufficient width to confine visible siltation within the 25 percent of the buffer zone nearer the land disturbing activity. Waters that have been classified as trout waters

by the environmental management commission shall have an undisturbed buffer zone 25 feet wide or of sufficient width to confine visible siltation within the 25 percent of the buffer zone nearest the land disturbing activity, whichever is greater. Provided, however, that the county may approve plans which include land disturbing activity along trout waters when the duration of said disturbance would be temporary and the extent of said disturbance would be minimal. This subdivision shall not apply to a land disturbing activity in connection with the construction of facilities to be located on, over, or under a lake or natural watercourse.

b. Unless otherwise provided, the width of a buffer zone is measured from the edge of the water to the nearest edge of the disturbed area, with 25 percent of the strip nearer the land disturbing activity containing natural or artificial means of confining visible siltation.

c. The 25-foot minimum width for an undisturbed buffer zone adjacent to designated trout waters shall be measured horizontally from the top of the bank.

d. Where a temporary and minimal disturbance is permitted as an exception by subsection (1)a. of this section, land disturbing activities in the buffer zone adjacent to designated trout waters shall be limited to a maximum of ten percent of the total length of the buffer zone within the tract to be distributed such that there is not more than 100 linear feet of disturbance in each 1,000 linear feet of buffer zone. Larger areas may be disturbed with the written approval of the director.

e. No land disturbing activity shall be undertaken within a buffer zone adjacent to designated trout waters that will cause adverse temperature fluctuations, as set forth in 15 NCAC 2B.0211 "Fresh Surface Water Classification and Standards", in these waters.

(2) Graded slopes and fills. The angle for graded slopes and fills shall be no greater than the angle, from zero to nineteen degrees, which can be retained by vegetative cover or other adequate erosion control devices or structures. Only when approved by the county may slopes be steeper than two foot of run to one foot of rise. In any event, slopes left exposed will, within 15 working days or 30 calendar days, whichever is shorter, of completion of any phase of grading, be planted or otherwise provided with ground cover, devices, or structures sufficient to restrain erosion.

(3) Ground cover. Whenever land disturbing activity is undertaken on a tract comprising more than one acre, if more than one acre is uncovered, the person conducting the land disturbing activity shall install such sedimentation and erosion control devices and practices as are sufficient to retain the sediment generated by the land disturbing activity within the boundaries of the tract during construction upon and development of said tract, and shall plant or otherwise provide a permanent ground cover sufficient to restrain erosion after completion of construction or development. Except as provided in section 23-238(b)(5), provisions for a ground cover sufficient to restrain erosion must be accomplished within 30 working days or 120 calendar days following completion of construction or development whichever period is shorter.

(4) Prior plan approval. No person shall initiate any land disturbing activity on a tract if more than one acre is to be uncovered unless, 30 or more days prior to initiating the activity, an erosion and sedimentation control plan for such activity must be both filed with and approved by the county. The county shall forward to the director of the division of water quality a copy of each erosion and sedimentation control plan for a land disturbing activity that involves the utilization of ditches for the purpose of dewatering or lowering the water table of the tract.

Design and Performance Standards.

(a) Except as provided in subsection (b)(2) of this section, erosion and sedimentation control measures, structures and devices shall be so planned, designed and constructed as to provide protection from the calculated maximum peak of runoff from the ten-year storm. Runoff rates shall be calculated using the procedures in the USDA, Soil Conservation Service's "National Engineering Field Manual for Conservation Practices," or other acceptable calculation procedures.

(b) In high quality water (HQW) zones, the following design standards shall apply:

(1) Uncovered areas in HQW zones shall be limited at any time to a maximum total area within the boundaries of the tract of 20 acres. Only the portion of the land disturbing activity within an HQW zone shall be governed by this section. Larger areas may be uncovered within the boundaries of the tract with the written approval of the director.

(2) Erosion and sedimentation control measures, structures and devices within HQW zones shall be so planned, designed and constructed to provide protection from the runoff of the 25-year storm which produces the maximum peak rate of runoff as calculated according to procedures in the United States Department of Agriculture Soil Conservation Service's "National Engineering Field Manual for Conservation Practices" or according to procedures adopted by any other agency of this state or the United States or any generally recognized organization or association.

(3) Sediment basins within HQW zones shall be designed and constructed such that the basin will have a settling efficiency of at least 70 percent for the 40-micron (0.04 mm) size soil particle transported into the basin by the runoff of that two-year storm which produces the maximum peak rate of runoff as calculated according to procedures in the United States Department of Agriculture Soil Conservation Services "National Engineering Field Manual for Conservation Practices" or according to procedures adopted by any other agency of this state or the United States or any generally recognized organization or association.

(4) Newly constructed open channels in HQW zones shall be designed and constructed with side slopes no steeper than three horizontal to one vertical if a vegetative cover is used for stabilization unless soil conditions permit a steeper slope or where the slopes are stabilized by using mechanical devices, structural devices or other acceptable ditch liners. In any event, the angle for side slopes shall be sufficient to restrain accelerated erosion.

(5) Ground cover sufficient to restrain erosion must be provided for any portion of a land disturbing activity in a HQW zone within 15 working days or 60 calendar days following completion of construction or development, whichever period is shorter.

Responsibility For Maintenance.

During the development of a site, the person conducting the land disturbing activity shall install and/or maintain all temporary and permanent erosion and sedimentation control measures as required by the approved plan or any provision of this article, the act, or any order adopted pursuant to this article or the act. After site development, the land owner or person in possession or control of the land shall install and/or maintain all necessary permanent erosion and sediment control measures, except those measures installed within a road or street right-of-way or easement accepted for maintenance by a governmental agency.

The full text of this article can be found under Chapter 23, Article VI of the Code of Ordinances County of New Hanover, North Carolina.

APPENDIX F: POST-CONSTRUCTION SITE RUNOFF CONTROLS

Included in this section:

Inspection Reporting Summary
Inspection Letter
Stormwater Detention Facility Compliance Inspection Report

Dates of Inspections	**June/July 2014**	**Jan./Feb. 2015**
Total # Sites Inspected	325	331
Response Letter Severity		
Level 1 (first letter)	42	27
Level 2 (second letter)*	0	1
Level 3 (third letter)**	0	0
# of Sites Requiring Maintenance	42	28

*If no response from first letter after 60 days, second letter is sent

**If no response from second letter after 60 days, third letter is sent

SAMPLE LETTER

Date

«OWNER»
«CO_OWNER»
«OWN_ADDR»
«OWN_CITY», «OWN_STATE» «OWN_ZIP»

RE: Storm Water Maintenance Inspection - «SUBD_NAME»
(Parcel # «PIN»)

The City of Wilmington Storm Water Services Section has recently completed a routine inspection of the storm water management facilities at «SIT_ADDR» for the above referenced site. The facility was inspected for compliance with the operation and maintenance requirements as outlined in the City's Technical Standards Manual. The City will be conducting these inspections a minimum of twice a year. Our ---------- (date) inspection indicates that the storm water facilities at the above property does not comply with current maintenance standards as listed on the attached Compliance Inspection Report.

According to the storm water management specifications and standards and the inspection and maintenance agreement from the responsible entities, corrective action must be taken within a reasonable time period. The City will be reinspecting the above storm water facilities to track the progress of any corrective action. I will be happy to work with you toward a satisfactory resolution of this matter. If you have questions, please contact me at 341-4694. Your cooperation and assistance in the City's storm water management efforts is greatly appreciated.

Sincerely,

Jim Quinn
Stormwater Specialist
Stormwater Services

Stormwater Detention Facility

Compliance Inspection Report

SITE:

DATE:

LOCATION:

The Stormwater Management for Post-Construction Ordinance requires a bi-annual inspection of all structural water quality detention facilities to ensure that they are being properly maintained and are functioning as originally designed.

The results of this inspection are as follows:

☐ **Visual inspection found no apparent problems with the facility.**
☐ **Please complete the following repairs and/or maintenance items within 60 days of this report**

Slopes
☐Repair eroded pond slopes
☐Repair erosion at pond inlet
☐Repair erosion at outlet structure
☐Re-seed and/or repair bare areas
☐Mow and regularly maintain vegetation
☐Regrade slopes and/or aquatic shelf

Inlets
☐Remove vegetative obstruction
☐Remove sediment accumulation within pipes

Emergency Spillway
☐Remove debris located in spillway
☐Remove trees and woody vegetation
☐Repair eroded areas and/or rip-rap

Outlet Structure
☐Remove debris obstructing outlet structure
☐Remove obstruction to orifice
☐Repair and/or replace trash rack
☐Repair trash screen for lower orifice
☐Remove vegetation around outlet structure

Pond Main Body
☐Repair vegetative shelf
☐Remove sediment accumulation
☐Remove floating debris and/or debris on slopes
☐Remove vegetation in pond that has reduced surface area

Other
☐_____
☐_____

Additional comments and maintenance concerns:
_____
_____
_____
_____
_____
_____
_____

Proper operation and maintenance are the sole responsibility of the property owner, and a vital part of ensuring the effectiveness of your detention facility. If you fail to complete the above maintenance in a timely manner, please be advised that the City of Wilmington reserves the right to complete the maintenance, and assess the owner for any costs or damages incurred. You will be notified if the City chooses to pursue this action.

Please inform this office of the date when work is completed, and if you should have any questions or comments concerning these items or future maintenance issues, please feel free to contact me at (910) 341-4694.

Inspected by: Jim Quinn Title: Stormwater Specialist

Summary of Plan Review Activities

Project Name	Project Type	Permit #	Permit Issue Date	Type of BMP	# of BMPs	Notes
Helmsdale at Landfall	SWP LD	2014015	7/1/2014	low density	0	
Family Dollar Wooster	SWP HD	2014016	7/25/2014	Infiltration, PC	4	
Masonboro Lodge Phase II	SWP LD	2014017	8/12/2014	Bioinfiltration, PC	4	Modification to project previosuly approved as a drainage plan in 2006
Tileston Campus accessibility project	Drain Plan	2014020	8/14/2014	Drain Plan	0	
Bojangles Market St	SWP HD	2014021	8/26/2014	wet ponds	1	
Holiday Inn Express Downtown	SWP HD	2014022	9/10/2014	Redev Exclusion	0	
The Forks	SWP HD	2014023	8/27/2014	Offsite, wet pond	1	1 on-site pond + partial offsite to Indep Pond
Rankin Place Terrace	Drain Plan	2014024	9/11/2014	Drain Plan	0	PC proposed, but not required
115 Beasley	SWP HD	2014025	9/15/2014	wet pond	1	w/ infiltration component
Enviva Pelletized Wood Facility	SWP HD	2014026	9/17/2014	infiltration basins	3	permit modification issued 7/17/2015
Fortune Place	SWP HD	2014027	10/14/2014	Wet Pond	1	
Figments Cottage	Drain Plan	2014028	10/17/2014	Drain Plan	0	
260 Raleigh St	SWP LD	2014029	10/27/2014	N/A, no BUA	0	
Ellington Farms	SWP HD	2014030R1	3/11/2015	Wet ponds	2	
Baker Residence - Landfall	SWP HD	2014031	11/14/2014	SW Wetland	1	
VOPAK Maintanence Bldg	SWP HD	2014032	11/20/2014	infiltration	1	
Riverfront Food & Beverage	SWP HD	2014033	11/20/2014	storm filters	1	
Murray Subdivision	Drain Plan	2014034	12/4/2014	drain plan	0	
Meridian at Fairfield	SWP HD	2014035	12/19/2014	Offsite	0	
Tribute Properties	Drain Plan	2014036	12/31/2014	Drain Plan	0	
River Road re-alignment	SWP HD	2015001	1/20/2015	N/A	0	
Urban Oasis	Drain Plan	2015002	1/23/2015	Drain Plan	PC to stay under 10k threshold	
Jervay ii/Dawson St. Lofts	SWP HD	2002042r2	12/17/2014	infiltration	mod. To existing City Permit	
Melton Oaks	SWP HD	2015003	2/18/2015	Wet Pond	1	
Div of Ivory Tract	Drain Plan	2015004	2/17/2015	Drain Plan	1	Infiltration in roadway (no outfall)
Forest Hills Vet	SWP HD	2015005	3/5/2015	Wet Pond	1	
Grace St Parking	Drain Plan	2015006	2/25/2015	Drain Plan	0	
Sawmill Point	SWP HD	2015007	4/14/2015	infiltration	3	
Cape Fear Museum	Drain Plan	2015008	4/6/2015	Drain Plan	0	
Oleander Beer & Wine	Drain Plan	2015009	3/24/2015	Drain Plan	0	
Nationwide Office Expansion	Drain Plan	2015010	3/25/2015	Drain Plan	0	
Andrew's Reach Phase II	SWP HD	2015011	4/8/2015	wet pond	1	
New Centre Lot 3R	SWP HD	2015012	4/15/2015	Offsite	0	
Pier 33	SWP Offsite	2015013	TBD	storm filters	1	
237 Greenville Ave (Reiser Holdings)	Drain Plan	2015014	4/21/2015	Drain Plan	0	
Mad Max Building	Drain Plan	2015015	5/22/2015	Drain Plan	0	
Hawthorne Commons Fitness Addition	Drain Plan	2015016	5/22/2015	Drain Plan	0	
NHRMC ER Expansion	SWP Offsite	2015017	5/27/2015	Offsite	0	
Belle Meade Apartments	SWP Offsite	2015018	6/8/2015	Wet Pond	1	

APPENDIX G: POLLUTION PREVENTION & GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

Form G-7

Sheet 1 of 1

EMPLOYEE TRAINING CHECKLIST

TRAINING TOPIC	SCHEDULE	ATTENDEES
NPDES PERMIT REQUIREMENTS Purpose of NPDES Program Permit Conditions	Annually	Members of Pollution Prevention Team
STORMWATER POLLUTION PREVENTION PLAN Purpose of SPPP Identification of potential pollutant sources Methods to reduce pollutants in stormwater Best Management Practices	Annually	Members of Pollution Prevention Team
SPILL PREVENTION AND RESPONSE PLAN Identification of potential spill areas Location of potential pollutant sources Spill response team Spill response procedure Spill response equipment Spill reporting procedure	Annually	All employees (other than administrative)
PREVENTATIVE MAINTENANCE Identify equipment (if any) Facility inspection requirement and schedule Documentation	Annually	All employees (other than administrative)
GOOD HOUSEKEEPING PROGRAM Regular cleanup procedures Material storage practices Facility inspection requirement and schedule Documentation	Annually	All employees (other than administrative)

The employee signature below indicates completion of the Stormwater Pollution Prevention training program.

Employee Signature: _____

Type/Print Employee Name and Title: JOHN FORNIN FLEET MANAGER

Date Training Received: 7/15/14

Instructor: James Quin 7/15/14

APPENDIX H: TOTAL MAXIMUM DAILY LOADS (TMDL)

Bradley & Hewletts Creek Watershed Restoration Plan

- Heal Our Waterways Program
- Cumulative Year End Reports for Contractual/Cooperative Agreements with:
  - New Hanover Soil & Water Conservation District (HOWBMP)

DATE OF EVENT/ ACTIVITY	EVENT/ACTIVITY	AUDIENCE	DELIVERED BY (AGENCY)	METHOD OF DELIVERY / MESSAGE	ATTENDANCE/ PARTICIPATION
Presentations					
7/5/2014	Presentation: Cape Fear River Watch	Cape Fear River Watch members and staff	Heal Our Waterways	PowerPoint presentation: Watershed restoration through community outreach and voluntary participation	34 attendees
9/17/2014	Presentation: Bio 501 Class at UNCW	Graduate students	Heal Our Waterways	PowerPoint presentation: Scientists in the workplace: Heal Our Waterways	23 students
9/26/2014	Presentation: Innovative Rainwater Harvesting Class	Landscapers Residents Engineers	Heal Our Waterways	PowerPoint presentation: Local stormwater issues	15 attendees
11/4/2014	Presentation: National Restore America's Estuaries conference	Scientists, government employees, engineers, non-profit	Heal Our Waterways	PowerPoint presentation: Watershed restoration through volume reduction	45 attendees
11/18/2014	Presentation: UNCW Environmental Law class	College seniors Graduate students	Heal Our Waterways	PowerPoint presentation: Regulation and restoration in Wilmington's watersheds and stormwater policy	28 students
1/21/2015	Presentation: International Low Impact Design Symposium	Engineers, planners, researchers, students	Heal Our Waterways	PowerPoint presentation: Tidal Creek community rain garden project	25 attendees
3/11/2015	Presentation: North Carolina Oyster Summit	Environmental organizations Regulators Researchers Private business General public	Heal Our Waterways	PowerPoint presentation and panel discussion: Watershed restoration for the next 5 years	150 attendees
3/16/2015	Presentation: Bio 501 Class at UNCW	Graduate Students	Heal Our Waterways	Panel discussion on education and employment in sciences	15 students
Informational Website					
Ongoing	Heal Our Waterways Informational Website healourwaterways.org	Watershed residents Interested public	Heal Our Waterways	Dedicated Heal Our Waterways website	HOWBMP Project info Stormwater education BMPs Volume Reduction Participation links

Media Campaigns

2/1/15-3/30/15	Wrightsville Beach Magazine	Residents and visitors	Heal Our Waterways	Print Ad: You can help make these signs a thing of the past (shellfish closure)	20,000 copies printed & distributed per month
May - June 2015	Fairway Outdoor Billboard Advertising	Motorists Pedestrians	Heal Our Waterways	Fertilizer awareness billboard on 2 billboards in Hewletts Creek Watershed: Is the grass really greener if it pollutes our waterways?	Target Audience: General public Reach: Motorists Frequency: Rotating - shown for 8 seconds every minute 24/7 Total cost: $1800
April - June 2015	WECT TV-6	Web and mobile viewers	Heal Our Waterways	Web and mobile platforms: Video Ads Skyscraper Ads Mobile Ads Video Pre-roll Ads	Target Audience: General public, males TV Reach: 74% for viewers age 35-64 WECT.com Web & Mobile Reach: 250,000 unique visitors per month and 1.9 million average page views per month Total cost: $3900

News Coverage

8/21/2014	WECT-TV6 news story	Station viewers	WECT reporter	TV news coverage - Researchers working to improve tidal creek water quality with rain gardens	Stats: -WECT-TV6 reaches 176,000 homes/per wk -WECT.com has 250,000 average unique visitors per month and 1,200,000 average page views per month unique visitors to online website
9/7/2014	Star News editorial	Newspaper and online readers	Star News editor	Print and online newspaper editorial - Conservation Efforts Can Pay Off, Especially When Groups Come Together	Stats: -Daily print newspaper and online website -94,492 print readers -628,086 monthly unique visitors to online website
Fall 2014	Surfrider Foundation Blog	Surfrider members	Paul Herzog	Print and digital online blog article- Got a Hurricane? Get a Garden!	Blog article to Surfrider members about the Tidal Creek rain garden project

Distributing promos/giveaways

11/18/2014	UNCW Environmental Law class	College seniors	Heal Our Waterways	pens, t-shirts, travel mugs, sticky-notes,	25 students
5/28/2015	Wrightsville Beach BMP Retrofit Workshop & Tour	Engineers Designers	Heal Our Waterways	Pens, Watershed maps, brochures, water bottles, bumper stickers	50 attendees
Ongoing	Public meetings, presentations, events	Event attendees, general public	Heal Our Waterways	Pens, t-shirts, mailings, travel mugs, sticky-notes, brochures	Ongoing

Grant Projects

Ended March 2015	NERRS Water Quality Improvement Grant	Watershed residents, general public	Heal Our Waterways UNCW NCCF Town of WB	Residential BMP installations Municipal BMP installations Education and Outreach	12 participating households (residential BMPs and outreach), 6 agencies in collaboration
Awarded 8/2014	319 grant	Watershed residents, general public	Heal Our Waterways NCSU	Design and installation of 6 BMP volume reduction practices in the Hewletts Creek Watershed	BMPs to be installed in Hewletts Creek Watershed on public and private properties

Citizen Contacts- Public Interaction

7/25/2014	Site visit	Watershed resident	Heal Our Waterways	One-on-one BMP consultation	2 homeowners
9/4/2014	NC Coastal Federation rain garden class	NC Coastal Federation members, local residents,	NC Coastal Federation Heal Our Waterways NC Coop. Extension	Question and answer session about HOW program, material distribution	Approximately 15 attendees
9/17/2014	Site visit	Watershed residents	Heal Our Waterways/ NC Cooperative Extension	One-on-one BMP consultation	2 homeowners
9/30/2014	Site visit	Watershed resident	Heal Our Waterways	One-on-one BMP consultation	1 property owner
10/13/2014	Site visit	Property owners	City of Wilmington, Stormwater	One-on-one flooding consultation	2 homeowners
12/4/2014	Site visit	Property owners	Heal Our Waterways	One-on-one BMP consultation	2 homeowners
12/5/2014	Site visit	Property owners	Heal Our Waterways	One-on-one BMP consultation	2 homeowners
12/10/2014	Site visit	Property Owners	City of Wilmington, Stormwater	One-on-one water quality consultation	4 homeowners
1/12/2015	Girl scout meeting	Girl Scouts	Heal Our Waterways	Casual presentation on constructed wetlands and plants	12 scouts
1/27/2015	Site visits	Watershed residents	Heal Our Waterways	One-on-one conversation on downspout reroutes	4 homeowners

Watershed Resident Mailings

12/4/2014	Targeted direct mail	Residents in Bradley & Hewletts Creek Watersheds and ICW direct drainage areas	Heal Our Waterways	Yard Waste	16,524 mailings to inform residents of proper yard waste disposal, pollution issues, and fines for clogging drainage routes
12/4/2014	Targeted direct mail	Residents in Bradley & Hewletts Creek Watersheds and ICW direct drainage areas	Heal Our Waterways	Fertilizer	16,524 mailings to inform residents about fertilizer pollution and ways to properly apply and reduce fertilizer use

BMP Projects Installed

June 2015	Raintree Neighborhood Wetland	Watershed - Hewletts Creek	Stormwater crews	Collect runoff from neighborhood sub-watershed and provide onsite infiltration and volume reduction	Total volume reduction: 2628 cu ft.
June 2015	Biddle Rain Garden	Watershed - Hewletts Creek	NHSWCD Coastal Stormwater Services, Inc	Residential Rain Garden	Total volume reduction: 100 cu ft.
June 2015	Blue Rain Garden	Watershed - Hewletts Creek	NHSWCD Coastal Stormwater Services, Inc	Residential Rain Garden -(2)	Total volume reduction: RG #1: 120 cu ft. RG #2: 173 cu ft.
June 2015	Gibson Rain Garden	Watershed - Hewletts Creek	NHSWCD Coastal Stormwater Services, Inc	Residential Rain Garden	Total volume reduction: 200 cu ft.
June 2015	Knolls Rain Garden	Watershed - Hewletts Creek	NHSWCD Coastal Stormwater Services, Inc	Residential Rain Garden	Total volume reduction: 267 cu ft.
June 2015	Long Rain Garden	Watershed - Hewletts Creek	NHSWCD Coastal Stormwater Services, Inc	Residential Rain Garden - (2)	Total volume reduction: RG #1: 45 cu ft. RG #2: 93 cu ft.

NEW HANOVER SOIL & WATER CONSERVATION DISTRICT
230 Market Place Drive, Suite 100
Wilmington, NC 28403

HOWBMP Quarterly Progress Report #4: April 1 – June 30, 2015

Scope of Services

New Hanover Soil & Water Conservation District will serve as a project manager for the Heal Our Waterways Program- Best Management Practice (BMP) Installations **(HOWBMP Program).**

NHSWCD will provide project management and oversight for the installation of BMPs in conjunction with the Heal Our Waterways program. 'Project management' includes the execution of a BMP project from start to finish including collaboration, current owner title search, budgeting, technical assistance, design & engineering, permitting, contracting, construction, homeowner/business/media relations, selection and reimbursement of contractors and monitoring.

BMPs will be identified in collaboration with the City and the GIS Atlas for the purpose of reducing runoff volume into Hewletts Creek, Bradley Creek, and the designated project areas draining directly into the Intracoastal Waterway. A potential BMP project's location, type, and proposed budget will require authorization from City Stormwater Services prior to any design or contracted work.

A recommended minimum of 2 volume-reduction BMPs and 8 downspout reroutes on private property will be installed during the contract period. However, collaboration and approval from the city would allow flexibility for unexpected project opportunities to deviate from the recommend minimum.

For each BMP project, NHSWCD will provide the city with the necessary project information to enter into the GIS Atlas.

Monitoring, or spot-checks, of completed BMP installations will be performed annually by NHSWCD for compliance. Monitoring will be required for five years for residential sites, and ten years for commercial or municipal BMP sites.

The BMP installations will be funded by the city with a lump-sum allocation of $20,000 to NHSWD at the beginning of the contract period. Any unused funds from this allocation will be reimbursed to the city at the end of contract period. NHSWCD will also reimburse the city for any returned funds from non-compliant property owners. NHSWCD will issue necessary 1099 tax forms to property owners that receive funded BMPs.

Reporting

Quarterly progress reports and invoices will be submitted in accordance with the following provisions:

Copies of invoices and totals of money spent for BMP installations ($20,000) will be provided to the city along with quarterly progress reports and invoices for contract fees.

Quarterly reports and invoices for contract fees are due within 10 days of the quarter end date and will follow templates and instructions set forth by Stormwater Services. Reports and invoices that do not follow templates/instructions will be returned for correction; payment will be processed once updated reports and invoices are received, reviewed, and approved. Payment will be made within 30 days after receipt of an approved invoice.

Submit cumulative quarterly progress reports for work performed according to the following quarters: July 1 - Sept 30; October 1 - Dec. 31; January 1 -March 31; April 1 - June 30. The 4th quarter progress report will serve as a compiled year end summary report.

The quarterly invoice should use the supplied template which shows the % of each service completed each quarter, invoice amount, and amount remaining to be paid. Invoices will be paid once quarterly progress report and invoice are received and reviewed by the City for adequate progress. Non-performance or inadequate progress may result in non-payment. No pre-payment of services will occur.

NHSWCD will maintain all records, reports, and invoices related to this contract on a fiscal year (FY) basis (July 1-June 30). These records should be retained for a period of at least 5 years. In addition, an annual compilation CD or DVD copy will be provided to the City of Wilmington Stormwater Services by July 10th for the prior FY. These files are public record and should be accessible.

All communications and reporting relating to this Agreement shall be through the parties' representatives. The parties may change representatives by written notice as provided herein. All notices under this Agreement must be in writing and given by certified mail, return receipt requested.

Fee Schedule

Lump Sum: NHSWCD shall receive a lump sum of **$20,000** upon execution and approval of this contract to specifically fund Best Management Practice (BMP) installations. Copies of invoices for these BMP installations will be provided to the city with quarterly reports.

Contract Fee: NHSWCD shall provide quarterly reports and invoices for the total contract fee amount of **$7,318** to execute the HOWBMP program.

Total Cost: The total cost of the Project shall not exceed **$27,318** without written approval of the City. Such approval shall be in the form of a written amendment to this Agreement approved by the City Manager or City Council, if required, and signed by the parties.

July 1 - September 30, 2013

Meet with representatives of Friends school located off of Pine Grove Dr. Looked at potential rain garden project at the school, but decided it was a better fit for CCAP program.

October1 - December 31, 2014

Scouted property and developments within the Hewletts and Bradley Creek Watersheds in order to canvas neighborhoods for potential downspout reroutes and rain gardens. Also requested program materials from Erin Carey to distribute to these neighborhoods during canvassing.

January 1 – March 31, 2015

Designed NHSWCD flyer to pass out to residents and communities to educate them regarding the HOW program and the District involvement. Also contact CEPCO, a company that manages Home Owner's Associations, in regards to becoming involved with community's they manage.

April 1 – June 30, 2015

Distributed flyer across Hewletts and Bradley Creek Watersheds to inform residents of the HOW program. Flyers explained the downspout disconnect program and potential BMPs. Information was also posted on the NHC internal website. Seven site visits for potential projects were completed. 5 rain gardens within the two watersheds were constructed. Each rain garden was approved by City Staff and District staff before installation. Each rain garden treated at least 50% of the impervious area in the given watershed where the BMP was located. Proof of volume reduction is included with each HOW tracking sheet. Information on each rain garden regarding size, volume reduction, and cost is included with attachment.

Report compiled by: Dru Harrison **Date:** 7/10/15

APPENDIX I: REGULATORY ENFORCEMENT ACTIONS

In 14-15 the Public Services Department Compliance Officer provided stormwater education and investigated approximately 68 requests. The majority were reports of illicit discharges to the storm drainage system followed by reports of violation of the Pet Waste section of the Stormwater Ordinance. The following table is a detail summary of the requests for compliance intervention for stormwater pollution issues.

ENFORCEMENT ACTIONS 2014-2015

Reporting period (FY15) July 1, 2014- June 30, 2015

Nature of Complaint	Number of Reports	Resolved thru Public Educati	NOVs Incidents	Referred to DWQ	# Civil Penalties
Pet Waste	11	100%	0	N/A	0
Outreach	15		0	N/A	N/A
Illicit Discharge/Sediment	42	90.5%	4	5	0
Illicit Connection	*1*	*0.0%*	*0*	*0*	*0*
Dry Weather Flow	*0*	*0.0%*	*0*	*0*	
SSO	*4*	*25.0%*	*3*	*3*	*0*
Totals for 1,2 and 3	68	94%	4	5	0

CIVIL PENALTIES 2014-2015

Nature of Compliant	Responsible Party	Address of violation	Date of Violation	Total Penalty
N/A	N/A	N/A	N/A	$0.00

DEFINITIONS: Nature of Complaint

Illicit Discharge/Sediment (Part 1, Sec. 12-22)

Complaints include reports of illicit discharges as defined by the ordinance. Reports include allowable as well as illegal discharges which is determined after the investigation is completed. Assessment when completed prescribes corrective action and can sometimes elevate to enforcement. All resolution of an incident typically includes education provided to the responsible party regarding stormwater pollution and awareness of the city ordinance as well as the potential fines for non compliance and repeat offenders. Written NOVs are issued for serious offences.

Illicit Connection (Part 1, Sec. 12-23)

Reports are the result of an illicit connection that impacted the City's stormwater system with an illegal discharge. Assessment when completed prescribes corrective action and can sometimes elevate to enforcement. All resolution of an incident typically includes education provided to the responsible party regarding stormwater pollution and awareness of the city ordinance as well as

the potential fines for non compliance and repeat offenders. Written NOVs are issued for serious offences.

SSO (Part 1, Sec.12-24)

Sewer overflows from the CFPUA system, both reportable and not reportable. Process is described in Illicit Discharge Section. Resolution of the incident also includes reviewing the DWQ SSO reporting form for cause and ensuring distribution of educational material pertaining to preventing grease related spills to residents near and contributing to the incident.

Pet Waste (Part 2, Sec. 12-28)

The pet waste complaint category included any report of violation of the City's Pet Waste Ordinance. These complaints which are reported by citizens or city employees, due to their nature, may not be substantiated after the investigation. Resolution of an incident includes distributing educational material to all parties involved on the adverse health effects of pet waste pollution, and prevention, as well as the City's ordinance requirements and the potential fines for violations.

Blockages (Part 2, Sec. 12-29)

Blockage reports include any complaint reported which were thought to have the potential to impede the flow of stormwater in the City's maintained drainage system. Resolution of the incident includes education to citizens involved directly or within the immediate area of the incident explaining how to prevent willful blockages of the stormwater system.

Yard Waste (Part 2, Sec. 12-29)

Yard waste complaints include calls the City received reporting violations of the City's stormwater ordinance which prohibits the intentional raking, sweeping, blowing, washing, directing or placing of yard waste into any part of the public drainage system which might impede the flow of water through the system or compromise water quality. Resolution of an incident includes removal of debris and distribution of educational material and/or explanation of the ordinance with the possible fines.

APPENDIX J: MAJOR OUTFALL LOCATIONS AND DESCRIPTION TABLE

Watershed	Latitude	Longitude	Size	Material	Number	Classification	Map Date	Condition
Barnards Creek	34.15865	-77.91188	6.0 X 8.0	RCP	Double	NPDES outfall found	2/20/2012	Good
Barnards Creek	34.16482	-77.92585	60	RCP	Double	NPDES outfall found	2/20/2012	Good
Barnards Creek	34.16657	-77.92957	60	RCP	Triple	NPDES Industrial outfall found	11/21/2011	Good
Barnards Creek	34.16113	-77.93105	42	RCP	Single	NPDES outfall found	11/2/2011	Good
Barnards Creek	34.16134	-77.93815	18	RCP	Quad	NPDES Industrial outfall found	11/14/2011	Good
Bradley Creek	34.20898	-77.83556	3.0 X 5.0	RCP	Single	NPDES outfall found	1/6/2012	Good
Bradley Creek	34.21320	-77.82715	2.0 X 4.0	RCP	Single	NPDES outfall found	8/29/2000	Good
Bradley Creek	34.21952	-77.84568	90	CAP	Double	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.21911	-77.85177	72	CMP	Double	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.20939	-77.83654	54	RCP	Single	NPDES outfall found	1/6/2012	Good
Bradley Creek	34.23066	-77.85234	54	CMP	Double	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.23284	-77.84028	54	CMP	Double	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.21585	-77.82498	48	CMP	Single	NPDES outfall found	1/31/2012	Good
Bradley Creek	34.21997	-77.86130	42	CMP	Single	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.22630	-77.85231	42	CMP	Single	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.20829	-77.83101	36	RCP	Single	NPDES outfall found	1/6/2012	Fair

Bradley Creek	34.20899	-77.83554	36	CMP	Single	NPDES outfall found	1/6/2012	Poor
Bradley Creek	34.20900	-77.83553	36	CMP	Single	NPDES outfall found	1/6/2012	Fair
Bradley Creek	34.21669	-77.83399	30	CMP	Single	NPDES outfall found	1/31/2012	Fair
Bradley Creek	34.21427	-77.83470	24	RCP	Single	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.21440	-77.83926	24	RCP	Double	NPDES outfall found	1/13/2012	Good
Bradley Creek	34.22066	-77.83784	24	RCP	Single	NPDES outfall found	1/31/2012	Good
Burnt Mill Creek	34.22878	-77.90517	11.0 X 12.0	RCP	Double	NPDES outfall found	2/28/2012	Good
Burnt Mill Creek	34.22870	-77.88923	5.0 X 6.0	CMP	Double	NPDES outfall found	2/28/2012	Good
Burnt Mill Creek	34.24617	-77.93366	72	SMP	Single	NPDES outfall found	2/28/2012	Fair
Burnt Mill Creek	34.23148	-77.91302	66	RCP	Single	NPDES outfall found	11/24/2010	Good
Burnt Mill Creek	34.24430	-77.92571	60	RCP	Single	NPDES outfall found	9/29/2010	Good
Burnt Mill Creek	34.23402	-77.91972	54	RCP	Single	NPDES outfall found	10/26/2010	Good
Burnt Mill Creek	34.23232	-77.91568	42	RCP	Double	NPDES outfall found	11/9/2010	Good
Burnt Mill Creek	34.23397	-77.91877	42	RCP	Single	NPDES outfall found	11/24/2010	Good
Burnt Mill Creek	34.23989	-77.92258	36	RCP	Single	NPDES outfall found	10/5/2010	Good
Burnt Mill Creek	34.24025	-77.92318	36	RCP	Single	NPDES outfall found	10/5/2010	Good
Burnt Mill Creek	34.25344	-77.92354	30	RCP	Double	NPDES outfall found	3/2/2012	Good

Drains directly to ICW	34.19570	-77.83301	48	RCP	Single	NPDES outfall found	1/6/2012	Good
Drains directly to ICW	34.19629	-77.82915	48	RCP	Single	NPDES outfall found	1/6/2012	Good
Drains directly to ICW	34.22229	-77.81978	48	IRON	Single	NPDES outfall found	1/17/2012	Good
Drains directly to ICW	34.22234	-77.81985	48	IRON	Single	NPDES outfall found	1/17/2012	Good
Drains directly to ICW	34.19503	-77.83000	36	RCP	Single	NPDES outfall found	11/22/2011	Good
Drains directly to ICW	34.19904	-77.82758	36	RCP	Single	NPDES outfall found	1/6/2012	Good
Drains directly to ICW	34.22121	-77.81566	36	RCP	Single	NPDES outfall found	1/17/2012	Good
Drains directly to ICW	34.22432	-77.81658	30	CMP	Single	NPDES outfall found	1/17/2012	Good
Drains directly to ICW	34.22433	-77.81659	30	CMP	Single	NPDES outfall found	1/17/2012	Good
Drains directly to ICW	34.22432	-77.81658	24	CMP	Single	NPDES outfall found	1/17/2012	Good
Drains directly to ICW	34.16461	-77.85628	2.5 X 5.0	CMP	Single	NPDES outfall found	7/19/2011	Fair
Greenfield Lake	34.19852	-77.93558	4.0 X 6.0	CMP	Triple	NPDES outfall found	2/22/2012	Good
Greenfield Lake	34.20094	-77.93381	60	RCP	Double	NPDES outfall found	2/22/2012	Good

Greenfield Lake	34.21255	-77.93161	60	CMP	Quad		2/22/2012	Good
Greenfield Lake	34.21429	-77.93563	48	RCP	Single	NPDES outfall found	2/23/2012	Good
Greenfield Lake	34.20127	-77.93568	42	RCP	Double	NPDES outfall found	2/22/2012	Good
Greenfield Lake	34.19964	-77.93615	36	RCP	Single	NPDES outfall found	2/22/2012	Good
Greenfield Lake	34.20462	-77.93537	36	RCP	Single	NPDES outfall found	2/22/2012	Good
Greenfield Lake	34.20751	-77.92997	30	RCP	Triple	NPDES outfall found	2/22/2012	Good
Hewletts Creek	34.18153	-77.86851	5.0 X 16.0	OTHER	Other	NPDES outfall found	11/17/2011	Good
Hewletts Creek	34.18020	-77.87198	90	CMP	Single	NPDES outfall found	11/3/2011	Good
Hewletts Creek	34.19421	-77.85211	60	CMP	Single	NPDES outfall found	11/21/2011	Fair
Hewletts Creek	34.17296	-77.85090	48	RCP	Double	NPDES outfall found	7/28/2011	Good
Hewletts Creek	34.18735	-77.85761	48	RCP	Single	NPDES outfall found	11/3/2011	Good
Hewletts Creek	34.19359	-77.85549	48	RCP	Triple	NPDES outfall found	11/18/2011	Good
Hewletts Creek	34.17112	-77.85107	42	RCP	Single	NPDES outfall found	7/19/2011	Good
Hewletts Creek	34.17879	-77.86842	42	RCP	Single	NPDES outfall found	2/16/2001	Good
Hewletts Creek	34.19498	-77.85447	42	RCP	Double	NPDES outfall found	11/18/2011	Good
Hewletts Creek	34.19680	-77.84352	42	CMP	Single	NPDES outfall found	11/22/2011	Fair
Hewletts Creek	34.20042	-77.86258	42	CMP	Single	NPDES outfall found	11/8/2011	Fair

Hewletts Creek	34.18468	-77.85373	36	RCP	Single	NPDES outfall found	2/26/2001	Good
Hewletts Creek	34.17878	-77.86844	30	RCP	Single	NPDES outfall found	11/7/2011	Good
Hewletts Creek	34.19419	-77.85209	18	RCP	Single	NPDES outfall found	2/6/2001	Good
Hewletts Creek	34.19430	-77.88617	2.0 X 4.4	RCP	Single	NPDES outfall found	2/24/2011	Good
Hewletts Creek	34.19471	-77.88822	6.0 X 8.0	RCP	Triple	NPDES outfall found	2/2/2011	Good
Hewletts Creek	34.19793	-77.88484	7.7 X 15.0	CAP	Single	NPDES outfall found	2/24/2011	Good
Howe Creek	34.24536	-77.82717	7.0 X 9.0	RCP	Double	NPDES outfall found	5/16/2007	Good
Howe Creek	34.25450	-77.82624	72	RCP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24701	-77.82334	66	CMP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24211	-77.82454	60	RCP	Single	NPDES outfall found	1/31/2012	Good
Howe Creek	34.24226	-77.82714	48	RCP	Single	NPDES outfall found	1/31/2012	Good
Howe Creek	34.24700	-77.82333	48	CMP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.26158	-77.82611	48	RCP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24225	-77.82718	42	RCP	Single	NPDES outfall found	1/31/2012	Good
Howe Creek	34.25029	-77.82655	42	RCP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.25030	-77.82655	42	RCP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24083	-77.82759	36	RCP	Single	NPDES outfall found	5/16/2007	Good

Howe Creek	34.24304	-77.82263	36	RCP	Double	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24519	-77.82714	36	RCP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24551	-77.82710	36	RCP	Single	NPDES outfall found	2/1/2012	Good
Howe Creek	34.24749	-77.82369	36	CMP	Single	NPDES outfall found	2/1/2012	Good
Cape Fear River	34.20807	-77.95086	10.0 X 10.0	RCP	Single	NPDES outfall found	3/15/2011	Good
Cape Fear River	34.21225	-77.94608	5.8 X 8.4	RCP	Triple	NPDES outfall found	3/25/2011	Good
Cape Fear River	34.19774	-77.95482	66	RCP	Single	NPDES Industrial outfall found	11/14/2011	Good
Cape Fear River	34.20913	-77.94735	48	RCP	Double	NPDES outfall found	4/1/2011	Good
Cape Fear River	34.18028	-77.95095	36	RCP	Single	NPDES Industrial outfall found	11/14/2011	Good
Cape Fear River	34.16995	-77.94822	30	RCP	Single	NPDES Industrial outfall found	11/29/2011	Good
Cape Fear River	34.21504	-77.94755	24	RCP	Single	NPDES Industrial outfall found	3/21/2011	Good
Cape Fear River	34.17135	-77.94984	18	RCP	Single	NPDES Industrial outfall found	2/21/2012	Good
Cape Fear River	34.17294	-77.94902	18	RCP	Single	NPDES Industrial outfall found	11/29/2011	Good
Cape Fear River	34.18391	-77.95205	18	RCP	Single	NPDES Industrial outfall found		Good
Cape Fear River	34.24197	-77.95273	3.0 X 10.0	RCP	Single	NPDES outfall found	6/10/2011	Good
Cape Fear River	34.21631	-77.94661	54	RCP	Single	NPDES Industrial outfall found	3/15/2011	Good
Cape Fear River	34.21646	-77.94663	54	RCP	Single	NPDES Industrial outfall found	4/11/2011	Good

Cape Fear River	34.22374	-77.95034	54	RCP	Single	NPDES outfall found	9/28/2009	Good
Cape Fear River	34.23969	-77.95146	48	RCP	Single	NPDES outfall found	5/27/2011	Inaccessible
Cape Fear River	34.24087	-77.95156	42	RCP	Single	NPDES outfall found	6/8/2011	Good
Cape Fear River	34.24089	-77.95155	42	RCP	Single	NPDES outfall found	6/8/2011	Good
Cape Fear River	34.24333	-77.95131	36	RCP	Single	NPDES outfall found	6/10/2011	Good
Cape Fear River	34.24991	-77.95037	36	RCP	Single	NPDES outfall found	6/14/2011	Good
Cape Fear River	34.25033	-77.94992	36	RCP	Single	NPDES outfall found	6/14/2011	Good
Cape Fear River	34.25729	-77.94434	36	RCP	Single	NPDES Industrial outfall found	6/10/2011	Good
Cape Fear River	34.24314	-77.95131	30	CPP	Single	NPDES outfall found	6/10/2011	Good
Cape Fear River	34.24977	-77.95055	30	RCP	Single	NPDES outfall found	6/14/2011	Good
Cape Fear River	34.25050	-77.94980	30	RCP	Single	NPDES outfall found	6/14/2011	Good
Cape Fear River	34.22764	-77.95054	24	CMP	Single	NPDES outfall found	5/16/2011	Good
Cape Fear River	34.22889	-77.94994	24	CMP	Single	NPDES outfall found	9/28/2009	Fair
Cape Fear River	34.24200	-77.95272	24	RCP	Single	NPDES outfall found	6/10/2011	Good
Cape Fear River	34.24319	-77.95121	24	CMP	Single	NPDES outfall found	6/10/2011	Fair
Cape Fear River	34.24964	-77.95067	24	RCP	Single	NPDES outfall found	6/14/2011	Good
Cape Fear River	34.25245	-77.94726	24	RCP	Single	NPDES Industrial outfall found	6/14/2011	Good
Cape Fear River	34.25728	-77.94432	24	RCP	Single	NPDES Industrial outfall found	6/10/2011	Good

Cape Fear River	34.24335	-77.95138	12	RCP	Single	NPDES outfall found	6/10/2011	Poor
Cape Fear River	34.25565	-77.94679	12	VCP	Single	NPDES Industrial outfall found	6/14/2011	Poor
Cape Fear River	34.23014	-77.94946	Inaccessible - submerged	RCP	Single	NPDES outfall	5/25/2011	Inaccessible
Smith Creek	34.25505	-77.87846	6.8 X 8.0	RCP	Single	NPDES outfall found	2/21/2012	Good
Smith Creek	34.25536	-77.87357	9.0 X 11.0	RCP	Double	NPDES Industrial outfall found	2/21/2012	Good
Smith Creek	34.25739	-77.94108	Not Found	UNKNOWN	Single	NPDES outfall submerged	2/28/2012	Unknown
Smith Creek	34.25711	-77.90656	7.0 X 8.0	RCP	Single	NPDES outfall found	2/21/2012	Good
Smith Creek	34.25756	-77.91249	6.0 X 7.0	RCP	Single	NPDES Industrial outfall found	2/21/2012	Good
Smith Creek	34.25718	-77.90675	72	RCP	Triple	NPDES outfall found	2/21/2012	Good
Smith Creek	34.25403	-77.89263	66	RCP	Single	NPDES outfall found	2/21/2012	Good
Smith Creek	34.25297	-77.93964	48	RCP	Single	NPDES outfall found	2/28/2012	Good
Smith Creek	34.25437	-77.90027	48	RCP	Single	NPDES outfall found	2/21/2012	Good
Smith Creek	34.25718	-77.88761	42	RCP	Single	NPDES outfall found	2/21/2012	Fair
Smith Creek	34.25761	-77.91556	42	RCP	Single	NPDES Industrial outfall found	2/21/2012	Good
Whiskey Creek	34.16376	-77.86289	72	CMP	Single	NPDES outfall found	3/27/2001	Good
Whiskey Creek	34.16654	-77.86775	42	RCP	Single	NPDES outfall found	7/18/2011	Good

Whiskey Creek	34.16362	-77.86228	36	RCP	Single	NPDES outfall found	3/27/2001	Good
Whiskey Creek	34.16670	-77.86858	36	RCP	Single	NPDES outfall found	7/18/2011	Good
Whiskey Creek	34.16671	-77.86860	36	RCP	Single	NPDES outfall found	7/18/2011	Good
Whiskey Creek	34.16779	-77.87648	5.5 X 7.0	CMP	Single	NPDES outfall found	7/18/2011	Good

APPENDIX K: DEFINITIONS

Act
See Clean Water Act.

Best Management Practice (BMP)
Measures or practices used to reduce the amount of pollution entering surface waters. BMPs can be structural or non-structural and may take the form of a process, activity, physical structure or planning (see non-structural BMP).

Built-upon Area
That portion of a development project that is covered by impervious or partially impervious surface including, but not limited to, buildings; pavement and gravel areas such as roads, parking lots, and paths; and recreation facilities such as tennis courts. "Built-upon area" does not include a wooden slatted deck, the water area of a swimming pool, or pervious or partially pervious paving material to the extent that the paving material absorbs water or allows water to infiltrate through the paving material.

Clean Water Act
The Federal Water Pollution Control Act, also known as the Clean Water Act (CWA), as amended, 33 USC 1251, et. seq.

Common Plan of Development
A construction or land disturbing activity is part of a larger common plan of development if it is completed in one or more of the following ways:

- In separate stages
- In separate phases
- In combination with other construction activities

It is identified by the documentation (including but not limited to a sign, public notice or hearing, sales pitch, advertisement, loan application, drawing, plats, blueprints, marketing plans, contracts, permit application, zoning request, or computer design) or physical demarcation (including but not limited to boundary signs, lot stakes, or surveyor markings) indicating that construction activities may occur on a specific plot. It can include one operator or many operators.

Department
Department means the North Carolina Department of Environment and Natural Resources

Division (DWQ)
The Division of Water Quality, Department of Environment and Natural Resources.

Director
The Director of the Division of Water Quality, the permit issuing authority.

Dry Weather Flow
Any flow in the MS4 that occurs after a 72 hour period without rain.

EMC
The North Carolina Environmental Management Commission.

Illicit Discharge
Any discharge to a MS4 that is not composed entirely of stormwater except .discharges pursuant to an NPDES permit (other than the NPDES MS4 permit), allowable non-stormwater discharges, and discharges resulting from fire-fighting activities.

Industrial Activity
For the purposes of this permit, industrial activities shall mean all industrial activities as defined in 40 CFR 122.26.

Large or Medium Municipal Separate Storm Sewer System
All municipal separate storm sewers that are either:

(a) Located in an incorporated place with a population of 100,000 or more as determined by the Decennial Census by the Bureau of Census; or
(b) Located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or
(c) Owned or operated by a municipality other than those described in paragraph (a) or (b) and that are designated by the Director as part of the large or medium separate storm sewer system.

Major municipal separate storm sewer outfall (or "major outfall")
Major municipal separate storm sewer outfall (or "major outfall") means a municipal separate storm sewer outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (discharge from a single conveyance other than circular pipe which is associated with a drainage area of more than 50 acres); or for municipal separate storm sewers that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or the equivalent), an outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Municipal Separate Storm Sewer System (MS4)
Pursuant to 40 CFR 122.26(b)(8) means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

(a) Owned or operated by the United States, a State, city, town, county, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under Section 208 of the Clean Water Act (CWA) that discharges to waters of the United States or waters of the State.

(b) Designed or used for collecting or conveying stormwater;
(c) Which is not a combined sewer; and
(d) Which is not part of a Publicly Owned Treatment Works (POTW) as defined in 40 CFR 122.2

Non-stormwater Discharge Categories
The following are categories of non-stormwater discharges that the permittee shall address if it identifies them as significant contributors of pollutants to the storm sewer system: water line flushing, landscape irrigation, diverted stream flows, rising groundwater, uncontaminated groundwater infiltration, [as defined in 40 CFR 35.2005(20)], uncontaminated pumped groundwater, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water (discharges or flows from fire fighting activities are excluded from the definition of illicit discharge and only need to be addressed where they are identified as significant sources of pollutants to waters of the United States).

Non-structural BMP
Non-structural BMPs are preventive actions that involve management and source controls such as: **(**I**)** Policies and ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space, provide buffers along sensitive water bodies, minimize impervious surfaces, and/or minimize disturbance of soils and vegetation; (2) policies or ordinances that encourage infill development in higher density urban areas, and areas with existing storm sewer infrastructure; (3) education programs for developers and the public about minimizing water quality impacts; (4) other measures such as minimizing the percentage of impervious area after development, use of measures to minimize directly connected impervious areas, and source control measures often thought of as good housekeeping, preventive maintenance and spill prevention.

Outfall
Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.

Permittee
The owner or operator issued this permit.

Point Source Discharge of Stormwater
Any discernible, confined and discrete conveyance including, but not specifically limited to, any pipe, ditch, channel, tunnel, conduit, well, or discrete fissure from which stormwater is or may be discharged to waters of the state.

Redevelopment
Means any rebuilding activity unless that rebuilding activity;
(a) Results in no net increase in built-upon area, and
(b) Provides equal or greater stormwater control than the previous development.

Representative Storm Event
A storm event that measures greater than 0.1 inches of rainfall and that is preceded by at least 72 hours in which no storm event measuring greater than 0.1 inches has occurred. A single storm event may contain up to 10 consecutive hours of no precipitation. For example, if it rains for 2 hours without producing any collectable discharge, and then stops, a sample may be collected if a rain producing a discharge begins again within the next 10 hours.

Storm Sewer System
Is a conveyance or system of conveyances which are designed or used to collect or convey stormwater runoff that is not part of a combined sewer system or treatment works. This can include, but is not limited to, streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains that convey stormwater runoff.

Stormwater Associated with Industrial Activity
The discharge from any point source which is used for collecting and conveying stormwater and which is directly related to manufacturing, processing or raw material storage areas at an industrial site. Facilities considered to be engaged in "industrial activities" include those activities defined in 40 CFR 122.26(b)(l4). The term does not include discharges from facilities or activities excluded from the NPDES program

Stormwater Management Program (SWMP)
The term Stormwater Management Program (SWMP) refers to the stormwater management program that is required by the Phase I and Phase II regulations to be developed by MS4 permittees.

Stormwater Plan
The Stormwater Plan is the written plan that is used to describe the various control measures and activities the permittee will undertake to implement the stormwater management program. The Stormwater Plan is a consolidation of all of the permittee's relevant ordinances or other regulatory requirements, the description of all programs and procedures (including standard forms to be used for reports and inspections) that will be implemented and enforced to comply with the permit and to document the selection, design, and installation of all stormwater control measures.

Stormwater Runoff
The flow of water which results from precipitation and which occurs immediately following rainfall or as a result of snowmelt.

Total Maximum Daily Load (TMDL)
A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL is a detailed water quality assessment that provides the scientific foundation for an implementation plan. The implementation plan outlines the steps necessary to reduce pollutant loads in a certain body of water to restore and maintain water quality standards in all seasons. The Clean Water Act, Section 303, establishes the water quality standards and TMDL programs.

Watershed Restoration Plan
For purposes of this permit, a Watershed Restoration Plan is any plan developed in consultation with the Division for voluntary implementation with the intent of enhancing water quality and/or implementing stormwater BMPs within 303(d) listed waters.