City of Fayetteville
NPDES Permit Program

2019 Annual Report

Permit Number NCS000246

August 31, 2019

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Section 1: Introduction

The City of Fayetteville has prepared this report in accordance with the Environmental Protection Agency (EPA) and the Clean Water Act to meet program reporting and monitoring requirements of the National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Discharge Permit (No. NCS000246) as issued by the State of North Carolina effective March 1, 2013. The permit provides authorization for the City of Fayetteville to discharge municipal stormwater to Waters of the State. The City of Fayetteville received it's renewed permit on October 10, 2018. The permit is effective for five (5) years and will expire at midnight on October 9, 2023

The City of Fayetteville Stormwater Program, under its Public Services Department, is responsible for the implementing and maintaining the provisions of the City's NPDES Stormwater Discharge Permit. This annual report, as prepared by the Stormwater Program, covers City NPDES Permit related activities from approximately July 1, 2018 to June 30, 2019.

It should be noted that in September of 2019, Hurricane Florence brought historic flooding to our region. During the reporting year, we have made efforts to clean up from Florence, as well as to continue our recovery efforts from Hurricane Matthew from 2016.

Section 2: Background

Fayetteville is one of only six NC Phase I municipalities, which are defined as municipalities which have a population of 100,000 or greater. Phase II permits cover all other NC municipalities along with some designated counties and petitioned areas that are required to seek a NPDES stormwater permit. The Six Minimum Measures are the baseline for all Phase II NPDES stormwater permits. Because of their size and potential to pollute stormwater runoff, the Phase I municipalities are subject to the Six Minimum Measures as well as some additional requirements.

Since the issuance of the permit on October 10,, 2018, the City continues to implement the provisions of this permit as follows:

1) Public Education and Outreach
2) Public Involvement and Participation
3) Illicit Discharge Detection and Elimination (IDDE)
4) Construction Site Runoff Controls
5) Post-Construction Site Runoff Controls
6) Pollution Prevention and Good Housekeeping for Municipal Operations
7) Monitor and Evaluate Pollutants in Stormwater Discharges to Municipal Systems
8) Water Quality Assessment and Monitoring

This report has been formatted to provide the progress, status, and results of each of the above permit requirements in the order as shown above and to coincide with the structure of the new Permit. The following major sections are the required program areas as outlined in the new Permit. The subsections under each major section are the required Best Management Practices (BMPs) for that Permit section.

Section 3: Public Education and Outreach

3.1 Target Pollutants and Sources

The Stormwater Program has determined that the following sources of pollution have significant impacts on water quality. Through proper education and public awareness, it is the objective of Stormwater to bring attention to the impacts that these sources have on water quality.

The specific pollution sources targeted for the public education and outreach program are as follows:

1) Lawn Care activities
2) Improper disposal
3) Poor housekeeping
4) Erosion

In addition to the above pollution sources, this Annual Report in Section 9 highlights the efforts of the Stormwater Program as it addresses stormwater quality concerns associated with industrial activities and in particular industrial "hot spots".

3.2 Target Audiences

The Stormwater Program has created a Public Education and Outreach campaign that targets several audiences throughout our community. The Stormwater Educator conducts several educational programs each year with the Fayetteville area schools inside the Cumberland County school system. The focus is to help children better understand what stormwater is, where it ends up, and the pollutants that it picks up along the way. For some grade levels, this information is a part of their Essential Standards for Science. These standards outline what information a teacher will cover during the school year, and what students will be tested on at the end of the year. Several of the events that Stormwater is involved in also reaches out to school aged children. Through the education and engagement of children, the Stormwater Program is able to reach out to parents. During this reporting year, the Stormwater Educator conducted approximately 16 presentations/demonstrations geared towards school children.

The Stormwater Program offers several publications geared towards homeowners between the ages of 25-55 due to the significant positive and negative impacts they can have on water quality. This age group represents a significant portion of the residents of the City. Also, citizens in this age group are more likely to contribute to pollution by engaging in activities such as dumping oil and other fluids into the storm drains, improperly disposing of yard wastes, and improperly applying pesticides and herbicides on lawns. Flyers, brochures, and other educational materials have been designed for this group. During this reporting year, Stormwater attended or donated information for approximately 8 events and presentations geared specifically towards this age group.

The Stormwater Program also offers several free video training programs aimed at educating businesses about stormwater pollution prevention. The types of businesses that are targeted have been identified as those whose job duties pose a potential threat to stormwater runoff, such as:

- Concrete companies
- Construction companies

- Landscaping and lawn care professionals
- Painting contractors / home renovation companies
- Restaurants and food service establishments
- City Departments

The Stormwater Program acknowledges our growing diversity in our community, and we strive to provide information to our Hispanic community by offering several publications in Spanish and bilingual flyers.

3.3 Informational Website

The Stormwater Program maintains a comprehensive website (www.fayettevillenc.gov/stormwater) that details the components of our program and permit, and offers citizens the opportunity to learn more about stormwater and water quality. A few of the topics addressed on the website include:

1. Stormwater Inspections
2. Stormwater Projects
3. Public Education and Involvement
4. Stormwater Management Ordinance and related documents
5. Frequently Asked Questions
6. Stormwater Related Downloadable Files

The website is updated on a regular basis in order to keep information current and citizens aware of what the Stormwater Program is doing. The website has also been utilized to keep citizens informed of the status of various stormwater projects. Through the use of this website, the City's Stormwater Program and Engineering Division are able to maintain public awareness about drainage issues within the City, as well as to inform citizens regarding traffic flow during emergency situations, and major maintenance of the drainage infrastructure.

3.4 Public Education Materials

The City's Stormwater Program provides quality educational brochures and flyers to inform citizens about stormwater and pollution prevention through a variety of sources. Details regarding these publications are described below:

1. Stormwater Inspectors continue to utilize educational flyers to hand out to the public with regards to spring lawn and garden activities,restaurant best manangement practices, and other related topics.
2. The Stormwater Inspectors continue to carry a supply of educational door hangers and other informational materials and use them on a regular basis to inform residents of stormwater related activities in the area.
3. Stormwater publications continue to be placed at 18 Recreation Centers throughout the City of Fayetteville and Cumberland County, as well as at eight County libraries. These entities are great sources of information for the public, and receive a lot of foot traffic throughout the year.
4. Educational brochures are distributed at all of the events where Stormwater is asked to participate. Stormwater also distributes materials to several events that Stormwater is not physically present. Information regarding these various activities can be found in the Public Education and Outreach Program subsection of this report.

5. Stormwater has brochures and flyers regarding the proper disposal of pet waste available to citizens at events and other activities.
6. Stormwater continues to use Spanish brochures during public awareness events to educate the growing local Hispanic population about stormwater pollution prevention. Some examples include spring lawn maintenance, charity car washes, and brochures detailing the City's Stormwater program.
7. Stormwater continues to distribute a cigarette butt litter brochure during the various events Stormwater attends. The brochure explains the various water quality issues associated with cigarette butt litter.
8. The Program revamped it's fee brochures to help homeowners and commercial property owners understand how the fee is calculated. An example of that brochure is below:

City of Fayetteville North Carolina STORMWATER

Stormwater Rates

Effective July 1, 2018

Property Description	Number of Billing Units	Annual Fee
Residential	1 ERU	$72.00/year
Non-Residential	1 ERU/2,266 sq. ft. of impervious area	$72.00/ERU/year
Undeveloped	None	No Fee

Fee Information & Calculation

In 1994, a Stormwater Discharge Permit was issued to the City of Fayetteville by the NC Department of Environment and Natural Resources (NC DENR) to meet unfunded federally mandated regulations to reduce polluted stormwater runoff under the 1987 Water Quality Act. Those regulations are still in place today and have since been strengthened. Compliance for those stormwater "quality" activities is funded through the local stormwater fee charged to City residents, businesses and institutions.

The stormwater fee (which includes components for "quality" and "drainage") is based on a property's impervious area and appears on the property's annual tax notice as STRMWATERFEE.

The total annual stormwater fee for a residential property is currently $72 in the City of Fayetteville. All residential properties are charged a flat fee. Residential properties include: single-family detached houses, mobile homes on an individual lot, individual duplexes, and residential condominiums.

The stormwater fee for non-residential (business) property is based on a calculated number of Equivalent Residential Units (ERU). One (1) ERU is the average amount of impervious area (2,266 square feet) found on a typical single-family residence.

Non-residential property owners who wish to confirm their stormwater fee should measure the total square footage of impervious area and divide that number by 2,266 to determine the total number of ERU's that they are billed. Impervious surface is defined as land cover that prevents or significantly impedes the natural infiltration of stormwater into the ground. Common impervious surfaces include building footprints, driveways and sidewalks, hard surfaced paving such as parking lots, patios, and solid decks.

Practices that reduce the negative impact of impervious area on the drainage system are strongly encouraged! If a non-residential property 1) has incorporated stormwater control facilities that are routinely and fully maintained by the property owner and meet certain defined minimum standards for peak-runoff reduction, or 2) currently maintains an individual or general National Pollutant Discharge Elimination System (NPDES) Stormwater Permit from the State of North Carolina, the property may qualify for an on-going credit to the annual stormwater fee.

The Stormwater Division can provide you with a summary of your bill determination and additional information regarding the possible credit.

If you wish to obtain additional information about your local Stormwater Program, please contact the **Stormwater Hotline at 910-433-1613 or on the web at: www.fayettevillenc.gov/stormwater.**

Commercial Property Example

Revised 7/2/2018

Photograph 1: Stormwater Fee Brochure

3.5 Hotline / Help Line

The Stormwater Hotline (910-433-1613), initiated in 1995 as an integral part of the Stormwater program, is a source of information and direction, and continues to be the primary means for the public to communicate incidents, complaints and suggestions on a 24/7 basis. During the past year, the Hotline received approximately 489 documented calls resulting in a Work Order for follow-up.

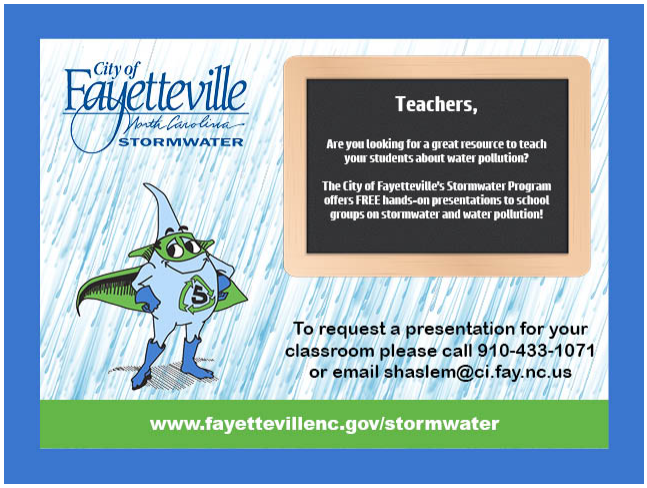
3.6 Public Education and Outreach Program

Stormwater has a documented Public Awareness Strategy which outlines specific goals that Stormwater intends to meet each year through its efforts. This strategy is updated on a regular basis, and is used to guide the Stormwater Program's public education and outreach efforts. This document is available to the public on the City of Fayetteville Stormwater website.

Throughout the past year, Stormwater contracted with several advertising agencies across several different media platforms to create awareness of the Stormwater Program. The following describes those efforts in detail:

1. Stormwater ran advertisements in three different issues of CityView, a popular local magazine published eight times a year with an estimated 78,000+ readers each issue. This equals to approximately 243,000 annual potential contacts.
2. Stormwater placed an advertisement in Discover Fayetteville, which is a visitors guide for Fayetteville. Readership for this magazine is approximately 85,000. Along with this publication, the Observer gives us space on their website which gives us approximately 50,000 digital impressions per run.
3. Stormwater placed an advertisement with Make the Grade, through the Fayetteville Observer to market towards teachers promoting in classroom demonstrations. The readership for this publication is approximately 85,000. Along with the print advertisement, we also get approximately 50,000 digital impressions with an ad that is placed on the Observer's website.
4. Stormwater contracts with Spectrum Reach to show four 30-second commercials on various channels. Approximately 548 paid stormwater commercials, and 279 free stormwater commercials ran on the Spectrum Reach cable network. There are approximately 100,196 cable subscribers in the Fayetteville zone.
5. The Weather Channel ran a "crawl" message (one that is shown and advances along the bottom edge of the viewing screen) regarding stormwater pollution for one week per month. During that week, the advertisement ran at least 80 times before 100,196 cable subscribers, as projected by Spectrum Reach.
6. The Stormwater Program continues to work with Corporate Communications to advertise various commercials and bulletins on the City's government access channel, FayTV and YouTube Channel. During the reporting year, Stormwater had seven informational segments air on the channel. These segments were filmed by our FayTV crew, and the topics included the differences between wastewater and stormwater, an inside look of a stormwater inspector's job, how to help keep storm drains clear, and a watershed study that is underway. These programs ran approximately 823 times before approximately 100,196 cable subscribers each time. Additionally, several "still" advertisements were viewed several times per day on FayTV before a potential viewership of 100,196 cable subscribers each time. See Photograph 2 on the following page for an example of one of the stills.
7. Advertisements continue to be displayed in the interior of the City Bus Fleet. These laminated "Bus Banners" display the "When It Rains, It Drains" stormwater pollution prevention message.
8. Stormwater utilized social media outlets such as the City of Fayetteville's Facebook, Twitter, and YouTube accounts to promote stormwater pollution prevention messages.
9. The Public Services Department continues to utilize its own Twitter account this past year, which the Stormwater Program has promoted several pollution prevention messages on.
10. Stormwater sent out six media releases and answered several media requests over the year involving stormwater related information.
11. Most outgoing City mail is stamped with an integral stormwater pollution prevention message in conjunction and adjacent to the postmark. There are four messages that are rotated on a quarterly basis and are relative to the time of year. This message reached approximately 61,000 residences over the last 12 months.

Photograph 2: Fayetteville TV Still Example



Photograph 3: Social Media Graphic

The Stormwater Educator continued to make formal presentations to local schools, civic clubs, and the general public regarding stormwater pollution. The Educator used various activities and tools such as the "EnviroScape" watershed model, "Be the Solution to Stormwater Pollution" video, "All About Wetlands", "Water Quality, Ask the Bugs!", and "The Incredible Journey" curriculum to aid in public education efforts. When giving school presentations, the Educator ensures that the information provided lines up with curriculum standards, so the presentations are relative to what the students are learning, and reinforces what the teacher has taught. The stormwater educator has also introduced a stormwater floodplain model that has been used for certain groups over the past year, and will continue to be introduced to school groups over the next several years.

The Stormwater Program sets up informational booths at several public events throughout the year. During these events, promotional items such as brochures, flyers, pens, pencils, tattoos, stickers, cups, water drop stress balls, silicone braclets travel pet waste containers, magnets, notepads, and chip clips are freely distributed. Each promotional item that is given away

includes contact information for the Stormwater Program, and some have information about the local stormwater program. In addition to promotional items being given away, a representative of the Stormwater Program is usually present to talk with citizens about the Stormwater Program at most events. Stormee, the Stormwater Pollution Fighter (mascot), has made several appearances at events throughout the year. Over the course of this reporting year, the Stormwater Program has made approximately 25,888 direct and indirect contacts. The following lists some of the major events that the Stormwater Program has appeared at:

1. Fall Safety Day (November 3, 2018)
2. Fayetteville Rotary Christmas Parade (December 8, 2018)
3. Cumberland County Schools Fall in Love with Math and Science Expo (February 16, 2019)
4. PWC's Water and Power Expo (March 22-23, 2019)
5. Fayetteville Dogwood Festival (April 27-28, 2019)
6. Public Works Night and Truck Touch (May 24, 2019)

Photograph 4: Dogwood Festival Booth

For each event, the Stormwater Educator and Stormwater Staff have provided information that is relevant for the event and has provided activities that would engage the participants. The Stormwater Educator has utilized several activities and tools mentioned above to provide public awareness about stormwater pollution prevention and the City's response to it. Following are several photographs from various public awareness events.

Photographs 5-6: Engineering Day

Since the Stormwater Program's inception, a focus has been made to coordinate public education efforts between various agencies and other City departments in order to provide information to the public in regards to stormwater pollution prevention. These agencies/departments include, but are not limited to:

- Fayetteville PWC
- Fayetteville Police Department
- Cumberland County Soil and Water Conservation District
- Cumberland County Cooperative Extension
- Cumberland County Schools
- Fayetteville/Cumberland Parks and Recreation

The following paragraphs describe some of those efforts.

Through a partnership with Stormwater, the Clark Park Nature Center and Lake Rim Park incorporates stormwater pollution prevention elements in various elements of their programs, to include the Environmental Mobile Unit (EMU). This past year, both parks gave stormwater related presentations and materials to approximately 2,282 children and civic group members. The Stormwater Educator has also teamed up with the Park Rangers to give presentations to school groups on numerous occasions.

Stormwater continues to share the cost to help supply Parks and Recreation with pet waste bags that are used in the local public parks. There are seventeen pet waste bag collection points spread throughout these parks.

Stormwater staff continues to sit on the Cumberland County Green Schools Advisory Team as an advisory member. The advisory team consists of several community agencies that meet quarterly to provide guidance for the Green Schools Program throughout the school year. This Green Schools program encourages schools to reduce their waste and increase conservation, so that the school system can be better stewards of the environment, and lower costs for the schools. Through this partnership, staff helped to give advice where needed, and was able to strengthen relationships with Cumberland County school personnel, as well as to form relationships with other community partners.

Stormwater provides educational materials to the Police Department which in turn distributes those materials through the local Community Watch program as requested.

In April of the reporting year, the Stormwater Program held a Backyard Stream Repair workshop in conjunction with North Carolina Cooperative Extension. This workshop was held to educate homeowners on the steps that they could take to repair eroded stream banks on their private property. There were approximately 30 attendees that participated in the class. The City also used this opportunity to create educational videos to be used by the Stormwater Program and Cooperative Extension.


Photographs 7-8: Backyard Stream Repair Class

The Stormwater Program continues to maintain educational signs along the Cape Fear River Trail. In total, there are four signs that educate citizens about Stormwater, the importance of wetlands, and how the habitats surrounding the Cape Fear River benefit the City.

Photographs 9 & 10: Educational Signs on Cape Fear River Trail

Section 4: Public Involvement and Participation

4.1 Volunteer Involvement Program

The City of Fayetteville through the Parks and Recreation Department coordinates two programs, Adopt-A-Street and Adopt-A-Site, to provide trash and litter pickup along streets and sites that have been adopted by volunteer groups. The groups volunteer to clean these areas several times a year. The City provides trash bags along with a list of safety procedures to be followed during the cleanup. The groups report their activities back to the City, and the City picks up the full trash bags for proper disposal. There are a total of 21 Adopt-A-Street participants that take on streets throughout the City, and assume the responsibility to clean the streets several times a year. Additionally, there are 15 specific sites throughout the City of Fayetteville that have been adopted and are cleaned on a regular basis. These groups provide a valuable service toward the improvement of water quality by picking up and properly disposing of trash and litter that could otherwise be discharged to the City's storm drainage system during the next rain event.

The Stormwater Program continues to partner with Fayetteville Beautiful, a local affiliation of Keep America Beautiful. Fayetteville Beautiful is responsible for a citywide clean up each spring. During the clean up on April 1, 2017, 316 volunteers picked up approximately 3,810 pounds of litter from City streets. Fayetteville Beautiful strives to keep the City clean, and to educate the public about the importance of putting litter in its proper place, thus keeping it out of local rivers and streams.

4.2 Public Involvement Mechanism

The City continues has an active Stormwater Advisory Board (SWAB) that meets regularly. The SWAB was established via ordinance in July 2009 as the City formed its own Stormwater Utility and Program continuing under the same general format as the Joint Stormwater Advisory Board as originally established with Cumberland County in 1995.

The City SWAB consisting of Fayetteville citizens provides guidance and advice to the City Council pertaining to the Stormwater Management Program. Additionally, the SWAB has the powers and duty in matters relating to the administrative review of any orders or decisions made by the Stormwater Manager. During the past year, the SWAB discussed several items, to include updating their bylaws to be more consistant with City ordinance, development of a City Right of Way maintenance policy and revision of the Stormwater Ordinance, expansion of the Stormwater Advisory Board, and budget discussions. The Board also adjuncticated an illicit discharge appeal, as well as to hear program updates from staff. The members are ready to continue their work on the board, and look forward to the next year of service.

4.3 Hotline / Help Line

Information on the City's Stormwater Hotline can be found previously in this Annual Report in Section 3.5.

4.4 Public Review and Comment

The Stormwater Plan continues to be posted on the City's Stormwater webpage for information as well as to seek public input. Additionally, hard copies have been made available at City Hall for any interested citizens.

As the City's Stormwater Program continues to evolve and improve, the Stormwater Program looks to review, revise, and update the Stormwater Plan during the coming permit year.

4.5 Public Notice

All regular meetings, special meetings, and hearings of the Stormwater Advisory Board are filed in accordance with the North Carolina Open Meetings Law. Notices of meetings are posted in a central location in City Hall, as well as posted on the City's website. All records, files, and accounts are considered public records as provided in the North Carolina General Statutes.

The Stormwater Program advertises in the Fayetteville Observer when necessary for Public Hearing Notices to notify residents about proposed changes to the Stormwater Management Ordinance.

Section 5: Illicit Discharge Detection and Elimination (IDDE)

5.1 Ordinance Administration and Enforcement

Article II. Illicit Connections and Improper Disposal of Chapter 23 Stormwater Management became effective in the City in July 2009. Prior to that, the City had been covered under Cumberland County's Ordinance as part of the previous joint Permit with the County. The City's Ordinance contains the exact same provisions as the previous County Ordinance. The Ordinance makes it illegal to place, deposit, or discharge anything except for stormwater runoff into the storm drainage system. There are some "DEQ approved" exceptions but overall the Ordinance is very inclusive. The Ordinance provides City staff with a right-of-entry to private property including buildings for enforcement actions when required. There is also a Schedule of Civil Penalties, reviewed and approved annually by City Council on the City's Fee Schedule, which details the fines and penalties associated with ordinance violations. The Ordinance is available to the public online through the City's Stormwater website, or through www.online.encodeplus.com/regs/fayetteville-nc/. During the reporting year, 14 Notices of Violation (NOV) were issued.

5.2 Stormwater System Inventory

The City has previously inventoried the stormwater system that is considered part of the public system. Thus, the inventory contains all stormwater structures and conveyances within the public right-of-way and follows the system to its outfalls into Waters of the State. The parts of the stormwater system that originate on private property are not part of the inventory. The inventory is updated with new structures and conveyances as they are constructed through as-builts that are submitted to the City at project completion.

Stormwater continues to utilize the stormwater inventory to detect and eliminate illicit connections and improper disposal, as well as to continue to ensure that all structures and conveyances are functioning as intended. Also, this information is being used to schedule maintenance by the City of Fayetteville along with NCDOT. The stormwater system inventory was instrumental in identifying outfalls to Waters of the State that need to be monitored as part of the field screening process. The stormwater system inventory was also proactively utilized to identify existing culverts under roadways that warranted inspection to detect any possible defects or structural problems.

5.3 Inspection / Detection Program

The City investigates possible illicit connections or improper disposal activities to detect and eliminate them. The City acts as the enforcement agent and has authority to issue fines. Additionally, during any enforcement action, the Inspector will educate the violator on stormwater quality and how similar situations can be avoided in the future. The City followed up on 20 documented work orders as a potential illicit connection or improper disposal. Many of these work orders involve improper disposal of yard waste, automotive fluids, and sediment, and two that involved restaurants improperly disposing of waste, which according to the Ordinance are considered improper disposals. If the potential violation is not obvious or if the need arises to more accurately identify a pollutant, the Stormwater Inspectors will collect samples and conduct water quality monitoring on an as needed basis. Also and as detailed later in this Annual Report, the City

works closely with the NCDEQ Land Quality Section's regional office in Fayetteville to correct the sediment situations and issue possible fines where warranted.

During the stormwater system inventory, the City located and identified all known outfalls to Waters of the State regardless of their size. As the City has completed the stormwater inventory, that data has been used to identify all major outfalls to Waters of the State that are 36 inches and greater. The City has identified 274 major outfalls to Waters of the State during this reporting period. In order to create a baseline, the City completed an initial dry weather screening of all the major outfalls once their location was established. Each year, the City aims to screen 100% of the identified outfalls for dry weather flows and evidence to detect and eliminate illicit connections or improper disposal. However, if it is not possible for all of the major outfalls to be screened, the major outfalls that are not screened in a given year are placed on the following year's list and are the first to be screened. Therefore, most of the major outfalls are screened every year but all of them are screened every two years at a minimum. Results of the screenings are recorded in an Excel spreadsheet and are considered a permanent record. During this reporting year, 80% of the major outfalls were screened. During inspections of the outfalls, the Inspector noted several outfalls had heavy vegetation and iron bacteria present. Some outfalls also had issues present that were due to construction nearby.

All of the major outfalls were screened for dry weather flows during this reporting year. The table below reflects the number of outfalls in each of the respective drainage basins.

BASIN NAME	# OF OUTFALLS	BASIN NAME	# OF OUTFALLS
Beaver Creek 1	34	Carvers Creek	10
Beaver Creek 2	25	Cross Creek	37
Beaver Creek 3	10	Little Cross Creek	26
Blounts Creek	48	Little Rockfish 1	12
Bones Creek	18	Little Rockfish 2	2
Buckhead Creek	19	Rockfish	2
Cape Fear 1	16	Stewarts Creek	1
Cape Fear 2	14		

Culvert Inspection Program

In November 2013, Stormwater developed a comprehensive Culvert Inspection Program to monitor the culverts under existing roadways (both City and NCDOT) within the City limits. Culverts are important to the City's infrastructure, as they help to control and direct the flow of runoff away from City streets during rain events. The City has identified over 300 culverts that are inspected on a yearly basis. These culverts are not only inspected for functionality, but water quality issues as well.

Inspections are conducted by walking mapped areas of culverts that have been identified. During the inspection, several types of data are collected, such as the condition of the culvert, debris/sediment found, percentage of culvert filled, severity rating, flowing water, and any obvious water quality issues (i.e. color, sheen, turbidity). All analysis is done in the field and is then addressed with appropriate staff. If water quality issues are present, samples are collected and tested

as needed for various water quality issues to include: detergents, total chlorine, total copper, pH, turbidity, dissolved oxygen and conductivity.

During the reporting year, 302 culverts were inspected. Of the 302 culverts inspected, most are in good condition, with only a few having erosion issues and some heavy vegetation. If maintenance work is needed in any of the culverts, the appropriate agency responsible for the culvert is notified. For City-maintained culverts, the City Streets Superintendent is notified, and for NCDOT-maintained culverts, the local NCDOT Maintenance Engineer is notified. It is the goal of the Stormwater Program, through the Culvert Inspection Program, to identify issues with the City's infrastructure, and correct them before the issue becomes a severe and/or dangerous problem.

Coordination with Fayetteville Public Works Commission (PWC)

Stormwater and PWC continue to work jointly on promoting water quality issues through their public relations programs. Additionally, Stormwater forwards potential sanitary sewer leaks to PWC upon discovery. Likewise, PWC alerts Stormwater anytime there is a sanitary sewer overflow that would potentially impact the water quality of the City's stormwater drainage system and, more importantly, local streams. In cases of sanitary sewer overflows, Fayetteville PWC sends email messages to both the Stormwater Manager and the Stormwater Inspections Supervisor detailing the specifics of the occurrence. Responses by Stormwater may vary depending on the nature of the problem and the threat to water quality. Therefore, there is open communication and continuous dialogue between these two agencies.

During the reporting year, PWC notified Stormwater and NCDEQ of 27 sanitary sewer overflows. Information on the overflows is as follows:

- July 17, 2018 Sanitary Sewer overflow at 5466 Yadkin Road, Fayetteville
  Approximately 300 gallons entered the system.
- August 9, 2018 Sanitary sewer overflow at 1145 Christina Street, Fayetteville
  Approximatley 100 gallons entered the system.
- September 17, 2018 Sanitary sewer overflow at 407 South King Street, Fayetteville
  Approximately 950 gallons entered the system
- September 18, 2018 Sanitary sewer overflow S. King Street and Locust Street, Fayetteville. Approximately 1,724,400 gallons entered the system.
- September 18, 2018 Sanitary sewer overflow 405 Vanstory Street, Fayetteville
  Approximately 1,136,850 gallons entered the system.
- September 19, 2018 Sanitary sewer overflow at 926 Carver Street, Fayetteville
  Approximately 4,216 gallons entered the system.
- September 19, 2018 Sanitary sewer overflow at 1712 Troy Drive, Fayetteville
  Approximately 141,075 gallons entered the system.
- September 20, 2018 Sanitary sewer overflow at 4013 Eastdale Drive, Fayetteville
  Approximately 418 gallons entered the system.
- October 9, 2018 Sanitary sewer overflow at 6828 Willow Court, Fayetteville
  Approximately 32,700 gallons entered the system.
- November 14, 2018 Sanitary sewer overflow at 6217 Falkland Court, Fayetteville
  Approximately 840 gallons entered the system.
- November 19, 2018 Sanitary sewer overflow at 905 Kensington Park Road, Fayetteville
  Approximately 120 gallons entered the system.
- November 26, 2018 Sanitary sewer overflow at 872 Santiato Drive, Fayetteville
  Approximately 640 gallons entered the system.

- December 5, 2018 Sanitary sewer overflow at 2118 Ancon Drive, Fayetteville
  Approximately 6750 gallons entered the system.
- December 8, 2018 Sanitary sewer overflow at 2717 Colgate Drive, Fayetteville
  Approximately 50 gallons entered the system.
- December 11, 2018 Sanitary sewer overflow at 416 Robeson Street, Fayetteville
  Approximately 600 gallons entered the system.
- December 12, 2018 Sanitary sewer overflow at 704 Ellis Street, Fayetteville
  Approximately 210 gallons entered the system.
- December 13, 2018 Sanitary sewer overflow at 6709 Brookshire Street, Fayetteville
  Approximately 5 gallons entered the system.
- January 3, 2019 Sanitary sewer overflow at 255 Ann Street, Fayetteville
  Approximately 20 gallons entered the system.
- February 13, 2019 Sanitary sewer overflow at 3200 Natal Street, Fayetteville
  Approximatley 4988 gallons entered the system.
- March 6, 2019 Sanitary sewer overflow at 705 Robeson Street, Fayetteville
  Approximately 8250 gallons entered the system.
- March 19, 2019 Sanitary sewer overflow at 714 Westmont Drive, Fayetteville
  Approximately 2340 gallons entered the system.
- March 28, 2019 Sanitary sewer overflow at 1812 Conover Drive, Fayetteville
  Approximatley 150 gallons entered the system.
- April 10, 2019 Sanitary sewer overflow at 5744 Waters Edge Drive, Fayetteville
  Approximately 15 gallons entered the system.
- April 12, 2019 Sanitary sewer overflow at 5426 Osage Court, Fayetteville
  Approximately 75 gallons entered the system.
- April 22, 2019 Sanitary sewer overflow at 5350 Silver Pine Drive, Fayetteville
  Approximately 10,200 gallons entered the system.
- June 4, 2019 Sanitary sewer overflow at 234 Green Street, Fayetteville
  Approximately 4 gallons entered the system.
- June 26, 2019 Sanitary sewer overflow at 3609 Ridgecrest Avenue, Fayetteville
  Approximately 1,150 gallons entered the system.

Coordination with County Health Department

Stormwater continues to forward discoveries of failing and potentially failing septic tanks to the Cumberland County Health Department and works with their personnel as needed to resolve the matter. The number of septic tank failures within the city limits of Fayetteville was not readily available, due to the fact that at the time of this report, the County had not finished their Annual Report. When issues arise, they are addressed through the repair of the system, and/or connecting to a sanitary sewer. Additionally, Stormwater has coordinated with the County Health Department to resolve issues of stagnant water and mosquito problems.

Sanitary Sewer Extension

In addition to the above coordination with the County Health Department, properties in Cumberland County that are primarily on septic tank continue to be annexed into the City of Fayetteville. As a result, these properties will be converted over time to the sanitary sewer. Thus, the proliferation of septic tanks in the urbanized area continues to be reduced. Therefore, reducing the opportunity where septic tanks can fail and in turn impact the local water quality.

5.4 Employee Training

Stormwater has documented "selected" training that each of the Stormwater staff has received over time. The Inspectors have attended a variety of internal and external classes, training seminars, and certification programs. Thus, each of the Inspectors has had adequate training to effectively inspect illicit connections, industrial facilities, stormwater SCMs, etc. Inspectors are also given opportunities for on the job training in each of these areas. Some of the major certifications that the Inspectors continue to receive training on are:

- Illicit Discharge Detection and Elimination Training
- Hazardous Materials Operations/OSHA Level II Chemical Spill Response
- Stormwater Permit and SWPPP Compliance Training
- Stormwater SCM Maintenance Training
- Erosion and Sediment Control Training I and II
- NPDES Certified Stormwater Inspector
- NC Notary Training
- Surface Water Identification Training and Certification
- Eco Stream Identification

The City of Fayetteville sent several representatives, including Stormwater staff, to the 2018 APWA NC Stormwater Management Division's Fall Conference. The event was attended by stormwater professionals from throughout North Carolina and included educational sessions that addressed current stormwater issues in North Carolina, as well as networking opportunities for professionals and peers.

Engineering Division staff received training on the Stormwater SCM Reviewer Certification through North Carolina State University. The staff recertifies their certification as it expires. Staff also attended classes on Geographic Information Systems (GIS) and Low Impact Development (LID) in order to stay current with these programs.

Stormwater continues to utilize the online training program to provide annual stormwater pollution prevention training to City employees. This format allows for City employees to be trained on stormwater pollution prevention on their own time around their work schedules. One of the biggest obstacles to scheduling training with other Departments is finding a date and time that works well with everyone involved. This online training will also help ensure that Departments are regularly trained on an annual basis and the flexible format ensures that more Departments will have access to training during any given time period. During this reporting year, FAST Bus Garage employees were trained using this online program.

5.5 Public Education and Outreach

Ongoing inspection visits of specific businesses such as commercial car washes, carpet cleaners, lawn care services, charitable car washes, etc. ensure continued education as to proper material disposal. The City provides free educational videos to businesses and other entities who may pose a potential high risk for pollution to educate them on stormwater pollution prevention. A description of these videos can be found in Section 8.9 (Employee / Staff Training) of this report. Follow-up investigations and monitoring occurs on all potential illicit connections and improper disposal activities.

5.6 Public Reporting Mechanism

Information on the City's Stormwater Hotline can be found previously in this Annual Report in Section 3.5.

Section 6: Construction Site Runoff Controls

6.1 Locally Delegated Program

The City does not currently have a locally delegated erosion control program for administrating a Construction Site Runoff Controls Program. This program has been and is currently provided by the local office of the NCDEQ Land Quality Section. Even though the City's existing Construction Site Runoff program is handled by the local office of the NCDEQ Land Quality Section, the City continues to aggressively inspect construction sites that are brought to their attention through complaints or other sources. The City developed a standard operating procedure (SOP) that provides a step by step outline as to how perform the inspection and any needed follow-up. These activities are fully coordinated with NCDEQ Land Quality Section. There continues to be an excellent working relationship between the City and NCDEQ to address all problems associated with construction sites.

Additionally, the above referenced program by NCDEQ's Land Quality Section regulates construction sites that are one (1) acre and larger. The City considers smaller sites as potentially discharging sediment and performs inspections and pursues enforcement measures through our local Ordinance when needed.

Section 7: Post-Construction Site Runoff Controls

7.1 Post-Construction Stormwater Management Program

During the last year, the City continued to perform engineering reviews of new development plans, both commercial and single-family, based on the City's Stormwater Management Ordinance, Chapter 23 of the City of Fayetteville's Code of Ordinances. Article III, Stormwater Control, requires stormwater SCMs to control peak discharge on new development as well as redevelopment so that the post-development peak discharge rate will be no greater than the predevelopment peak discharge rate. This provision minimizes the downstream flooding impacts arising from new development. In February 2012, the City adopted proposed revisions to Article III to make the Ordinance compliant with Phase II post-construction requirements. The Article was subsequently approved by the Division of Water Quality (DWQ). Based on the State's approval, the City of Fayetteville was delegated the authority to administer the post-construction program on a local level. Therefore, the Ordinance contains both stormwater quantity and quality provisions. Last of all and to address the concern regarding the ongoing maintenance of stormwater facilities in single-family subdivisions, the City decided to accept the functional maintenance responsibility for these facilities, if the developer requests such.

During this reporting year, no changes were made to the Ordinance. Staff continues to review the Ordinance to ensure that it is serving its purpose the way that it is written. Additionally, City staff continues to regularly meet with the Homebuilders Association of Fayetteville (HBAF) as the City's Post-Construction Stormwater Management Program continues to evolve. Thus, there is

ongoing dialogue with the development community on the Ordinance, its provisions, and implementation.

During the reporting year, the City retained a municipal advisory firm, Raftelis, to perform an evaluation of the City's stormwater program with a specific focus on the development review process and the rate fee. As a result of this review, the City Council voted to raise the rate in order to support the development of a watershed master plan for the City. It was also agreed that additional staff would be brought on board to help oversee the watershed studies and resulting capital projects.

The above referenced Stormwater Management Ordinance is available on the City's website as well as through the Internet at http://www.online.encodeplus.com/regs/fayetteville-nc/.

7.2 Post-Construction SCM Strategies

The above referenced Article III utilizes the "Stormwater Design Manual" as developed by the North Carolina Division of Water Quality. Therefore, local engineers and developers are able to utilize any of the SCMs in the Manual to address their post-construction site runoff control requirements. Currently, the City of Fayetteville utilizes the State's Stormwater Design Manual in their locally delegated Water Supply Watershed and Phase II Stormwater Programs.

Article III requires the long term operation and maintenance of structural SCMs by the property owner. This is accomplished by requiring that the structural SCM be inspected on an annual basis and the inspection report submitted to the City of Fayetteville. The inspection and report are designed to determine any maintenance needs and how they are to be repaired. Article III requires that the inspection be performed and the report signed by a qualified professional. The City's Stormwater Management Ordinance defines a qualified professional as "a qualified registered North Carolina professional engineer, surveyor, landscape architect, soil scientist, aquatic biologist, or person certified by the North Carolina Cooperative Extension Service for stormwater treatment practice inspection and maintenance."

The exception to the above is in single-family subdivisions where the developer requests that the City provide the functional maintenance responsibility for the structural SCM. In these cases, the City performs the annual inspection and determines any functional maintenance needs. If necessary, City resources provide the needed repairs. The property owners in the subdivision are still responsible for the routine maintenance such as grass cutting, trash removal, and landscaping.

During the reporting year, the Engineering staff reviewed 63 plans for initial compliance with the Stormwater Ordinance and Administrative Manual and other local requirements, and had 81 plans resubmitted for review. Additionally, inspections were made at various stages of the SCM installation process to ensure that the SCM will be functional once the project is complete.

7.3 Deed Restrictions and Protective Covenants

Section 23-32 Minimum Stormwater Quality Control Requirements of Article III of the Ordinance contains the following provision:

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

7.4 Operation and Maintenance Plan

Section 23-27 Plan Requirements of Article III of the Ordinance contains the following provision:

A plan for maintenance of privately owned stormwater management facilities shall be included as part of the stormwater design plan which as a minimum shall specify the following:

a. *Types of maintenance activities which should be anticipated so that the proposed drainage system and stormwater management facilities will operate as designed.*
b. *The frequency and amount of maintenance that should be anticipated.*
c. *The equipment that will be required to perform the needed maintenance.*
d. *Name, address, and telephone number of the party responsible for maintenance.*

Section 23-39 outlines the requirements for the operation and maintenance agreement which must be executed on all privately owned stormwater management facilities. The city shall provide a standard agreement for this purpose.

Please note that Article III of the Ordinance requires that the above Operation and Maintenance Plan be submitted to the City for review and approval prior to the issuance of a permit for the construction of the improvements.

7.5 Setbacks for Built-Upon Areas

Section 23-32 Minimum Stormwater Quality Control Requirements of Article III of the Ordinance contains the following provisions:

For low density projects:

Built-upon area shall be at a minimum of 30 feet landward of all perennial and intermittent surface waters draining less than or equal to 640 acres. Built-upon area shall be at a minimum of 75 feet landward of all perennial and intermittent surface waters draining greater than 640 acres.

For high density projects:

Built-upon area shall be at a minimum of 50 feet landward of all perennial and intermittent surface waters draining less than or equal to 640 acres. Built-upon area shall be at a minimum of 75 feet landward of all perennial and intermittent surface waters draining greater than 640 acres.

7.6 Education and Training Program

Stormwater maintains an Administrative Manual that details how stormwater plans are to be prepared, submitted, and reviewed by the City. The Manual outlines the entire process from

approval of the construction plans to the inspection and approval of the stormwater control measures (SCMs). The Manual was specifically prepared to educate and train engineers and developers on the new requirements for Post-Construction Site Runoff Controls. As a matter of fact, the City engaged a Stakeholder Committee consisting of local engineers and developers to assist in the development of the Administrative Manual.

Since the Administrative Manual became effective in February 2012, local engineers and developers have used it for the preparation and submittal of plans to the City. In particular, the Appendices contain numerous forms that are required during the design, construction, and closeout phases of the stormwater SCMs. Additionally, City staff uses the Manual to review and approve the design, construction, and closeout of all stormwater projects. In particular, the Appendices contain numerous form letters that the City utilizes to approve, disapprove, or issue notices of violation for all phases of a stormwater project. Stormwater also plans to review and update the Administrative Manual on a regular basis to ensure that it reflects any updates to Article III of the Ordinance (Stormwater Control) or other procedural modifications. The Administrative Manual is available to the public on the City of Fayetteville Stormwater website (www.fayettevillenc.gov/stormwater).

Section 8: Pollution Prevention and Good Housekeeping for Municipal Operations

8.1 Operation and Maintenance Program

The City provides an extensive network of municipal operations designed to keep these operations and services functioning properly. A number of these operations impact the storm sewer system directly, such as storm sewer system maintenance and street sweeping, and indirectly, such as landscape management and municipal building maintenance. The cumulative impact of all these operations on the storm sewer system can potentially be significant, so it is important to have operation and maintenance programs that take impacts to the storm sewer system into consideration.

First of all, the City has developed a list of its facilities that have significant potential for generating polluted stormwater runoff. A list of these facilities is provided in Section 8.2. During this past year as well as for many previous years, the Stormwater Inspectors have inspected each of these facilities for any situations that may generate polluted stormwater runoff. Any concerns that are found during the initial inspection are always verified and corrected during follow-up inspections.

Also, the Stormwater Program is in ongoing contact with those other City operations that have the potential for impacting stormwater runoff. In particular and as outlined in Section 5.4, Stormwater oversees and coordinates various training opportunities for City employees. During the past year, employees from Parks and Recreation, the FAST Bus Garage, and the Street Maintenance Division received specific training. Additionally, City employees are reminded how their actions can impact the quality of stormwater runoff through the Public Education and Outreach Program.

Recycling

In regards to the recycling of household items, the City of Fayetteville's Solid Waste Division provides a curbside recycling program for its citizens where recyclables are picked up weekly. Citizens are given the choice whether to use the standard 36-gallon rollout container or purchase

a 96-gallon rollout container. Items that are suitable for recycling are: glass bottles and containers, plastic containers, aluminum cans, steel cans, newspapers, corrugated cardboard and food boxes, and mixed paper. The recycling program not only reduces the amount of waste going to the landfill but as reduces the opportunity for these items to end up in the storm drainage system. The City of Fayetteville also has seven sites where recyclable items can be dropped off throughout the City to include recreational centers and fire stations.

Household Hazardous Waste

The Cumberland County Household Hazardous Waste (HHW) Facility continues to provide for the proper disposal of household hazardous waste materials. The HHW Facility reported that 12,152 pounds of household hazardous waste had been collected and processed during the past year.

Used Oil Collection

The used oil recycling program continued in the private commercial sector. Also, the County Solid Waste Department provides used oil recycling at its rural container sites as well as the Ann Street Landfill and Household Hazardous Waste (HHW) Facility. The HHW Facility reported that 2,743 pounds of motor oil were collected last year.

8.2 Facility Stormwater Pollution Prevention Plans

In previous years, Site Pollution Prevention Plans (SPPP) have been developed for all of the City of Fayetteville facilities listed in Section 8.3. The SPPPs are used as an implementation guide for maintaining good housekeeping and reducing stormwater pollution. Topics covered in the SPPP include: best management practices, monitoring, training, inspections, spill prevention/response, vehicle/equipment cleaning, and preventative maintenance. Pertinent staff from each facility was trained on their respective Site Pollution Prevention Plan when the plan was developed and provided to the facility.

8.3 Facility Inventory and Site Inspections

Facility	Industrial Permit	Physical Address
PWC Wastewater Treatment Plant (Cross Creek)		601 North Eastern Boulevard
PWC Water Treatment Plant (P.O. Hoffer)		502 Hoffer Drive
PWC Water Treatment Plant (Glenville Lake)		628 Filter Plant Road
PWC Electrical Storage Yard		1035 Old Wilmington Road
PWC Fleet Maintenance Facility		1035 Old Wilmington Road
PWC Electric Generation Plant (Butler Warner)		2274 Custer Avenue
Fayetteville Regional Airport	Yes	400 Airport Road
Fayetteville Area System of Transit Bus Garage	Yes	455 Grove Street
Solid Waste Facility		455 Grove Street
Building Maintenance Facility & Fueling Station		325 Grove Street
Street Division Facility		335 Alexander Street
Milan Street Storage Yard		400 Milan Road
Marsh Street Storage Facility and Truck Wash		704 Marsh Street
Parks and Recreation Maintenance Facility		602 Ann Street
Parks and Recreation Maintenance / Storage		214 Gray Street

Facility		
Waste Industries Transfer Station		583 Winslow Street

Fayetteville Public Works Commission (PWC) Wastewater Treatment Plant (Cross Creek)
This Fayetteville PWC Wastewater Treatment Plant was last inspected by Stormwater on May 30, 2019 with no discrepancies found. This facility previously operated under Permit Number NC00023957. However and on August 27, 2015, the Fayetteville NCDEQ office issued No Exposure Certification NCGNE1080 removing this facility from its previous permit requirements. Stormwater will continue to inspect this facility on an annual basis to ensure compliance with the no exposure certification.

Fayetteville Public Works Commission (PWC) Water Treatment Plant (P.O. Hoffer)
This facility was inspected on June 13, 2019. There were no apparent issues at the facility. The Supervisor of the Hoffer Water Treatment Plant was emailed the inspection summary dated June 14, 2019.

Fayetteville Public Works Commission (PWC) Electrical Storage Yard
The PWC Electrical Storage Yard was inspected by Stormwater on June 12, 2019 and did not any areas of concern. PWC Environmental Compliance staff was informed of the inspection via a letter from Stormwater written on June 14, 2019.

Fayetteville Public Works Commission (PWC) Fleet Maintenance Facility
The PWC Fleet Maintenance Facility was inspected by Stormwater on June 12, 2019 and did not have any areas of concern. PWC Environmental Compliance staff was informed of deficiencies via a letter from Stormwater written on June 14, 2019.

Fayetteville Public Works Commission (PWC) Electric Generation Plant (Butler Warner)
The PWC Butler Warner Electric Generation Plant currently operates under a State Industrial Permit (NCS000369). This facility was last inspected by Stormwater on March 28, 2019. There were no issues found at the time of the inspection and the supervisor was sent an inspection summary via email on 4-1-19.

Fayetteville Regional Airport
The Fayetteville Regional Airport currently operates under Certificate of Coverage Number NCG150056 which was issued on June 4, 2010. The General Permit (NCG150000) for this Certificate of Coverage was reissued by the NC Division of Water Quality on September 1, 2014. This facility was last inspected by Stormwater on October 16, 2019. There were no discrepancies noted during the inspection and the supervisor was sent an inspection summary via email on 10-16-18.

Fayetteville Area System of Transit (FAST) Bus Garage
The FAST Bus Garage continues to operate under Certificate of Coverage Number NCG080712 which was renewed on December 4, 2012. The General Permit (NCG080000) for this Certificate of Coverage was reissued by the NC Division of Water Quality on November 1, 2012. This facility was inspected on March 21, 2019. The only issues found were refresh hydrocarbon booms around outfall and storm drain locations to reduce petroleum product pollution, update Stormwater Pollution Prevention Plan (SPPP) to include the new general permit, add a list to SPPP to include significant spills in the last 3 years, and cover large on site dumpsters to reduce

solids entering the storm drainage system. Staff was notified of findings via a letter written on March 25, 2019.

Solid Waste Facility
This facility was inspected on March 21, 2019 and the area needs to cover permanent large on site dumpsters to reduce solids entering the storm drainage system. Staff was notified of findings via a letter written on March 25, 2019.

Building Maintenance Facility and Fueling Station
This facility was last inspected by Stormwater on June 20, 2019 and several issues were identified which needed to be addressed. Corrective action that needs to be taken is store old tires and empty chemical jugs under covered shelter until disposal, do not wash equipment on gravel lot without proper inlet protection at stormwater drain and routinely police site for windblown debris cleanup. Staff was informed of deficiencies via a letter from Stormwater on June 26, 2019.

Street Division Facility
This facility was inspected by Stormwater on June 20, 2019. The facility was found to have some concerns with cleanup of wind-blown debris and pallets should be localized in one area at each site. The Streets Division Superintendent and City Traffic Engineer were informed of deficiencies via a letter on June 26, 2019.

Milan Road Storage Yard
This location was last inspected by Stormwater on June 20, 2019 and was found to need a dumpster to deposit creek cleaning debris into. The Superintendent of Street Maintenance was informed of the deficiency via a letter dated June 26, 2019.

Marsh Street Storage Facility and Truck Wash
This facility was last inspected by Stormwater on June 20, 2019 and was found to have deficiencies which needed to be addressed. Corrective actions to be taken are to refresh the rock entrance/exit into the site and the rock conveyance leading to the stormwater outfall and the sand/salt pile should be covered and have a berm installed to prevent runoff into the stormwater drainage system. The Superintendent of Street Maintenance was informed of deficiencies via a letter from Stormwater on June 26, 2019.

Parks and Recreation Maintenance Facility on Ann Street
This facility was last inspected on June 20, 2019 and was found to have a minor issue which needed to be addressed. The dumpster area needed to be cleaned up. The Supervisor for Parks and Recreation Maintenance was notified of deficiencies via a letter from Stormwater on June 26, 2019.

Parks and Recreation Maintenance / Storage Facility on Gray Street
This facility was last inspected on June 20, 2019 and was found to have minor deficiencies which needed to be addressed. Issues include replacing the fabric insert inside the drop inlet and remove empty buckets from fence behind tractor attachments and store under covered shelter until disposal. The Supervisor for Parks and Recreation Maintenance was notified of deficiencies via a letter from Stormwater on June 26, 2019.

Waste Industries Transfer Station

This facility was inspected on June 5, 2019. The facility was found to have only a few concerns such as, replacing the fueling hose on the diesel tank, continuing to monitor catch basin clean-up and general clean-up of the grounds from windblown debris should be done on a regular basis. Staff was informed of these deficiencies via a letter from Stormwater on June 10, 2019.

8.4 Municipal Spill Response Procedures

Spill Response Procedures have been developed and incorporated into the previously mentioned Site Pollution Prevention Plans for Milan Road Storage Yard located at 400 Milan Road, Marsh Street Facility located at 704 Marsh Street, Street Maintenance and Traffic Services Facility located at 335 Alexander Street, Building Maintenance, Parks and Recreation Facility and Fueling Station located at 280 Lamon Street, the Parks and Recreation Maintenance Facility located at 602 Ann Street, and the Parks and Recreation Maintenance / Storage Facility located at 214 Gray Street. Within the SPPPs, the municipal spill response procedures for each facility have been identified and outlined. Stormwater Staff gave a presentation outlining the pollution prevention plan to pertinent staff at each of the locations mentioned above. The staff was provided copies of the SPPP and additional handouts with regards to the presentation during the training.

Additionally, Spill Prevention, Control, and Countermeasure (SPCC) Plans have been developed for PWC Wastewater Treatment Plant (Cross Creek) located at 601 North Eastern Boulevard, PWC Water Treatment Plant (P.O. Hoffer) located at 502 Hoffer Drive, PWC Water Treatment Plant (Glenville Lake) located at 628 Filter Plant Road, PWC Electrical Storage Yard and Fleet Maintenance Facility located at 1035 Old Wilmington Road, and PWC Electric Generation Plant located at 2274 Custer Avenue. As part of these SPCC Plans, Facility Maps showing the onsite stormwater system and flow directions have been developed to control any spills that might occur.

8.5 Vehicle and Equipment Cleaning Operations

The Marsh Street Truck Wash is used to wash trucks, street sweepers, and other heavy equipment, etc. The facility was constructed with sumps in the drain inlets where sediment will settle out and will be later removed and disposed of properly by the City's Jet-Vac. The system also drains to an oil / water separator where the discharge is treated. Last of all, the wash water is eventually discharged to the sanitary sewer, not the storm drainage system.

8.6 BMP Evaluation for Streets, Roads, and Public Parking Lots Maintenance

Based on the City's previous evaluation of BMPs in 2016 to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots within the corporate limits, the City continues to follow the select BMPs to fully implement:

- Street Sweeping
- Yard Waste Containerization
- Loose Leaf Collection
- Spill Response (HAZMAT)
- Person Street "Greenstreet" Streetscape
- Public Parking Lots

- Animal Control
- Dog Park
- Coordination with NCDOT

Each of the above BMPs is detailed in Section 8.7.

8.7 BMP Implementation for Streets, Roads, and Public Parking Lots Maintenance

Street Sweeping

Street Sweeping operations are an effective best management practice for water quality, in that it removes potential pollutants from entering the storm drainage system during rain events. The Stormwater Program now provides all funding for the City's street sweeping operations. The City Street Maintenance Division performs this service on City streets as well as on some NCDOT roads, including selected thoroughfares, through a maintenance agreement. In regards to the street sweeping schedule, the thoroughfares are typically swept at night due to less traffic. These streets are swept ten (10) times during the year or about once per month except during the heart of winter. The sweeping process requires a water spray that does not work well in cold temperatures. The thoroughfare schedule includes NCDOT streets through the agreement previously referenced. Residential / subdivision streets are swept four (4) times per year plus shortly behind the leaf collection as close as possible. Thus, most of the residential / subdivision streets are swept five (5) or six (6) times per year. During the past reporting year, 4,519 tons of debris was removed as a result of the City's street sweeping efforts.

Yard Waste Containerization

The City's Solid Waste Division collects containerized yard waste once per week throughout the year. Citizens have the choice to purchase a brown yard waste container through Solid Waste, or may use clear plastic yard waste bags or other approved containers to containerize debris. Containerization of yard waste and debris helps the City to continue to look appealing, as well as to prevent this material from flowing into the storm drainage system. Details regarding the pickup of yard waste are outlined in Chapter 22, Article I of the City's Solid Waste Ordinance. Stormwater promotes yard waste containerization through its educational program to help prevent stormwater pollution.

Loose Leaf Collection

Stormwater promotes the City of Fayetteville's loose leaf collection. During the fall leaf season, City residents can place their loose leaves and pine straw at the curb for pick-up during specific collection periods. This program provides for the timely removal of the leaves prior to them being washed into the storm drainage system. Stormwater coordinates with Solid Waste to educate citizens on proper placement of their loose yard waste to ensure that it does not reach the drainage system. At other times throughout the year, Chapter 22, Article I of the City's Solid Waste Ordinance requires containerization of all leaves for efficient and effective pick-up. Again, the containerization requirement keeps the leaves from being washed down streets and other conveyances, and into the storm drainage system.

Spill Response

The Hazardous Materials (HAZMAT) Team continues to provide regional emergency spill response. The members of the HAZMAT unit are not only skilled fireman, but are also certified in hazardous materials by the State of North Carolina. Firemen who are part of the HAZMAT

team also receive a wide variety of training to handle different types of hazardous materials and situations once they are assigned. The HAZMAT team is also contracted by the State of North Carolina as one of seven Regional Response teams. The team is in charge of responding to incidents that cover a twelve county area. It is through these response teams that counties in the region receive the necessary help and materials to handle large HAZMAT calls.

HAZMAT responds anytime there is an opportunity where hazardous materials or substances might be discharged to the environment. The Stormwater Program is concerned about those incidents where hazardous materials or substances might be discharged into the storm drainage system and possibly into Waters of the State. During the reporting year, HAZMAT responded to 20 documented spills or releases within the City Limits that had the potential of impacting the storm drainage system.

Stormwater takes an active role in any HAZMAT spill response where material could potentially enter the drainage system and eventually Waters of the State. Stormwater will plug any drainage lines in the vicinity of a spill where the spill might enter a portion of the drainage system. If necessary, Stormwater will contact an environmental firm who is qualified to clean materials out of the storm drainage system. Stormwater coordinates the efforts to ensure that hazardous materials do not reach the Waters of the State.

Person Street "Greenstreet" Streetscape

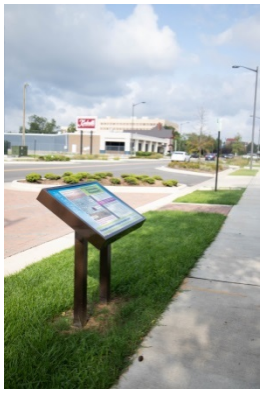
Previously, City Engineering completed the design on a "Greenstreet" project for two blocks of Person Street (which is a major corridor for Downtown Fayetteville). During the reporting year, the City of Fayetteville completed construction on the two block street renovation of Person Street. Person Street is located upstream and discharges its runoff to Blounts Creek. The design for this project incorporates innovative Low Impact Development (LID) devices which aida in runoff reduction and pollution reduction. Devices such as linear bio-filtration bump-outs, Silva Cells, and an experimental undersized permeable pavement design are used in this project. These devices meet LID volume reduction and quality improvement goals for this project. Blounts Creek is a biologically impaired stream upstream of the Greenstreet project and benefits from improved water quality from the devices.

This project's objective is to evaluate the applicability of Silva Cells, a subsurface stormwater system, to urban environments within the Sandhills region, assess the application of using LID practices within existing linear transportation right-of-ways and analyze the potential to increase the recommended permeable pavement drainage areas. The anticipated goals to be accomplished through this project include decreasing the overall runoff volume entering into Blounts Creek, increasing the stormwater runoff quality, expanding public education regarding stormwater impacts, providing a more pedestrian friendly transportation corridor, and revitalizing the aesthetic value of this thoroughfare through infrastructure upgrades.

The City of Fayetteville and NC State University's Biological and Agricultural Engineering Stormwater Engineering Group have begun to conduct research on this project. This project, using innovative water quality treatment devices through stormwater engineering, will provide results that can be disseminated on a national and international scale through publication in scientific journals and technical papers. Through this dissemination of information, it is the objective that LID implementation in urban environments will be more widely used and accepted.

The City of Fayetteville is looking to set the example to the development community and surrounding communities by leading the way in environmental stewardship and implementation of LID practices.

The City continues to maintain the educational signs that describe the stormwater control measures along the greenstreet.

Photographs 11 & 12: Person Street Educational Signs

Animal Control

The City of Fayetteville continues to enforce Chapter 3, Article II of Cumberland County's Animal Control Ordinance within the City limits. This Ordinance requires owners of animals to immediately dispose of animal waste from any public or private property, properly. Violators of this Ordinance can face violation notices, fines, leading up to loss of animal (until fees are paid) for habitual offenders. This ordinance helps our community to look better and it has a positive impact on water quality.

Dog Park

A trend in many communities is to set aside a public place where owners can bring their dogs for recreation. Along those lines, the City of Fayetteville continues to operate the Riverside Dog Park, located near the Cape Fear Botanical Gardens. The park is a joint effort of community involvement between the Bark for a Park committee and Fayetteville / Cumberland Parks and Recreation. There are two designated areas, one for dogs smaller than twenty-five pounds and the other for any dog larger. All dogs in the park are to be on a leash and have license and tags on their collars. Additionally, dog owners are educated and encouraged to properly dispose of their dog's waste. The park is supplied with dog waste bags to help encourage this behavior. The proper disposal of dog waste makes for a better park but it also improves the quality of the stormwater runoff leaving the park.

Coordination with NCDOT

Stormwater continues to coordinate with the local NCDOT on various stormwater activities such as street sweeping and ditch maintenance programs as well as issues related to their NPDES permit implementation.

8.8 Operation and Maintenance for Municipally Owned or Maintained Structural Stormwater SCMs and Storm Sewer System

On May 1, 2015, the City finalized the document "Operation and Maintenance for Municipally-Owned or Maintained Structural Stormwater SCMs and the Storm Sewer System". This document summarized the City's operation and maintenance program for structural stormwater SCMs and the storm sewer system (including catch basins, the conveyance system, and structural stormwater controls). The City's operation and maintenance program highlights the following components:

- Structural Stormwater SCMs
- Maintenance Transfer Program
- Drainage Inspection
- Drainage System Maintenance
- Limited Creek Cleaning Program
- Beaver Management Program

Each of the above components is detailed below.

Additionally and to supplement the above referenced document, the Stormwater staff during the reporting year reviewed several Standard Operating Procedures (SOP) for various activities involving the inspection and maintenance of the stormwater drainage system. The SOPs are as follows:

- Storm Drainage System Maintenance and Inspection
- Catch Basin Maintenance and Inspection
- Drainage Ditch Maintenance and Inspection

Structural Stormwater SCMs

The City of Fayetteville owns or maintains several structural stormwater SCMs throughout the City. The following is a list of those structural stormwater SCMs, the type of SCM, and the entity responsible for maintenance:

Structural SCM Location	Type	Maintenance Responsibility
Airborne and Special Operations Museum	Rain Garden, Constructed Wetland, and Bioretention Areas	City of Fayetteville
Fayetteville Regional Airport	Dry Extended Detention Basin and Grassed Swale	Airport Grounds Maintenance
Swainey Avenue	Dry Extended Detention Basin	City of Fayetteville
Butler Warner Generation Plant	Wet Detention Basin	Fayetteville PWC Grounds Maintenance
Waddell Drive	Wet Detention Basin	Fayetteville PWC Maintenance

Thelbert Drive	Wet Detention Basin	Fayetteville PWC Maintenance
Fayetteville PWC Electrical Storage Yard	Sediment Basin	Fayetteville PWC Grounds Maintenance
Winslow Street Transfer Station	Wet Detention Basin, Forebay, and Sediment Baskets	Waste Management
Person Street "Greenstreet" Streetscape	Linear Bio-Filtration Swales, 13 Bio-Retention Bump-Outs, Silva Cells, Permeable Pavement, and Filterra Bioretention Systems	City of Fayetteville
James Creek North	Extended Dry Detention Basin	City of Fayetteville
Transit Multi-Model Facility	Rain Harvesting for Irrigation	Fayetteville Area Transit System (FAST)
Rosehill Road Aquatic Center	Extended Dry Detention Basin	City of Fayetteville
Fire Station #12 Hope Mills Road	Wet Detention Basin	City of Fayetteville
Westover Aquatic Center	Extended Dry Detention Basin	City of Fayetteville

The Stormwater Inspectors inspect each of the above SCMs on an annual basis. The Inspectors utilize the *BMP Maintenance and Inspection Checklist* as contained in Appendix 4-3 of the City of Fayetteville's "Administrative Manual for Implementation of the Stormwater Control Ordinance" for that specific structural stormwater SCM.

The annual maintenance on each of the SCMs is performed by personnel from the City Department or other responsible party as listed above. First of all, maintenance activities focus on issues as outlined in the above referenced Inspection Report. Additionally, the maintenance personnel perform those maintenance tasks as outlined in the applicable *Maintenance Tasks and Schedule* contained in Appendix 4-2 (SCM Maintenance Plan) of the City of Fayetteville's "Administrative Manual for Implementation of the Stormwater Control Ordinance".

In regards to the innovative Low Impact Development (LID) devices anticipated as part of the Person Street "Greenstreet" Streetscape, Operation and Maintenance Manuals will be developed as part of the design and construction process. Once installed and properly functioning, these structural stormwater SCMs will be maintained by the Stormwater Program accordingly.

Maintenance Transfer Program

Chapter 23 (Stormwater Management), Article III (Stormwater Control) of the City of Fayetteville Code of Ordinances contains provisions that allow developers of single-family residential subdivisions to transfer functional maintenance responsibility of their SCMs to the City. This transfer takes place once the SCM has been constructed and fully functional for at least one year. Also, the groundcover and required plant life must be fully established prior to the transfer of functional maintenance responsibility. The property where the SCM is located will be owned by the homeowner association. Therefore, the homeowner association will have

responsibility for the routine maintenance of the facility. Routine maintenance includes the cutting of the grass, trash removal, and upkeep of the landscaping. The homeowner association is also required to remove any invasive plant life such as cattails, hydrilla, etc.

The following is a list of those structural stormwaterSCMs and the type of SCM that have been transferred to the City for functional maintenance:

Structural Stormwater SCM	Type
Lakedale Ph1	Wet Detention
Winberry Subdivision	Dry Extended Detention Basin

The Stormwater Inspectors inspect the dry extended detention basins in the James Creek North and Winberry subdivisions on an annual basis. The Stormwater Inspectors use the *SCM Maintenance and Inspection Checklist, Dry Extended Detention Basin* as contained in Appendix 4-3 of the City of Fayetteville's "Administrative Manual for Implementation of the Stormwater Control Ordinance" to perform these inspections.

Maintenance on these dry extended detention basins is conducted by Stormwater Program personnel based on issues highlighted in the above referenced Inspection Report. In addition to addressing those maintenance issues observed during the annual inspection, Stormwater Program personnel perform the maintenance tasks as outlined in *Dry Extended Detention Basin, Maintenance Tasks and Schedule* contained in Appendix 4-2 (SCM Maintenance Plan) of the City of Fayetteville's "Administrative Manual for Implementation of the Stormwater Control Ordinance".

Drainage Inspection

Stormwater originally and continues to make routine inspections of the drainage system based on drainage complaints. Stormwater inspects the problem area, assesses the source of the problem, then reports the problem to the appropriate agency (City Street Maintenance Division, City or County Engineering, NCDOT, etc.). Stormwater maintains a computerized database of open Work Orders until the problem is resolved. This complaint driven process was greatly enhanced based on the results from the stormwater inventory. Therefore, based on data from the inventory, the inspection and maintenance of the storm drainage system has become more efficient, effective, and systematic.

Additionally, all members of the City's Street Maintenance Crews including the Leaf Cleaning Crews have been instructed to observe the storm drainage system as they carry out their daily responsibilities in the field. Based on their field observations, they report any potential maintenance needs through the proper channels. Also, the Inspectors in the Construction Management look for any drainage system maintenance needs as they inspect construction projects involving new and replacement/upgraded infrastructure throughout the City.

Drainage System Maintenance

During the last year, the City Street Maintenance Division reported that more than 7,992 linear feet of the drainage system were cleaned by the Jet-Vac process as documented in the City's work order system. This maintenance practice provides benefits by removing sediments and other pollutants that might otherwise be washed downstream during a heavy rain. During this reporting year, the Streets Division and Stormwater Program continued to use the RovverX Long-Range Pipe

Inspection Crawler to assist in drainage pipe inspection. This camera system continues to aid staff in detecting issues (damaged pipes, problems with pipe joints, and potential illegal connections) within the City's piped drainage infrastructure. The camera has greatly enhanced system maintenance and upkeep, while also allowing for a more timely resolution to problems that are detected. Also, the Streets Division and Stormwater Program continue to use pole cameras to quickly and effectively address minor issues or concerns with the storm drainage system.

Limited Creek Cleaning Program

Based on a change to City ordinance in June of 2019, the City has discontinued the Creek Cleaning program.

Due to the sandy nature of the soils in the Fayetteville area, there is a tendency for sediment buildup to occur in many of the local streams. Based on existing Nationwide Permits as issued by the US Army Corps of Engineers, the City is allowed to remove this sediment accumulation for a distance of 150 feet downstream of the City's major outfalls. In those cases, the Stormwater Program coordinates with both the NCDEQ as well as the US Army Corps of Engineers, as necessary, to ensure that the sediment is properly removed and that the original streambed is not altered. Coordination with these agencies is always done prior to the sediment removal.

Beaver Management Assistance Program

The Limited Creek Cleaning Program has grown to include coordination with the local wildlife Beaver Management Assistance Program (BMAP) to remove debris and obstructions in local waterways. Through a Cooperative Service Agreement, the City of Fayetteville partners with the US Department of Agriculture Wildlife Services (USDA APHIS WS) to provide City residents with these needed services to reduce or eliminate property damage and threats to human health and safety caused by beaver activities within the City limits. The Beaver Management Assistance Program effectively removed 8 beavers during the reporting year.

8.9 Employee / Staff Training

During the reporting year, Stormwater staff continued to utilize the training packages "Storm Watch" and "Storm Warnings" which cover Stormwater Pollution Prevention to train City employees as well as made the packages available to local businesses. This past year employees from Parks and Recreation, and the FAST Bus Garage,participated in the Good Housekeeping training for City Employees. It is the goal of Stormwater that all departments that have a potential to pollute stormwater will receive training on a regular basis. The materials cover the following:

- Good Housekeeping and Spill Prevention
- Vehicle and Equipment Washing, Fueling, and Repair
- Vehicle and Equipment Maintenance
- Spill Reporting and Response
- Street Maintenance
- Outdoor Storage and Management of Materials and Wastes
- Landscaping and Lawn Care
- Outdoor Manufacturing
- Dust Producing Processes

It should be noted that all current Stormwater Inspectors have a "Stormwater SCM Inspection and Maintenance Certification" as required by the North Carolina Department of Environment and Quality (NCDEQ) and the City of Fayetteville.

Section 9: Industrial Facilities Evaluation and Monitoring

9.1 Industrial Facility Inventory

The City receives a listing of all the facilities in the City of Fayetteville that have an Industrial NPDES Stormwater Discharge Permit from the local office of NCDEQ. This listing also includes those EPA Section 313 facilities located in the City of Fayetteville. The inventory is primarily comprised of those facilities supplemented by field findings, Yellow Pages review, and other sources. The inventory of industries is updated annually based upon receipt of the latest listing of Industrial NPDES Stormwater Discharge Permits from the Fayetteville Regional Office of NCDEQ. Currently, the City has 25 permitted industries on the industrial list that are inspected on an annual basis.

9.2 Industrial Facilities Inspection Program

The City has developed a standard operating procedure (SOP) that is used by all of its Inspectors as they make industrial facility inspections. The SOP provides a step-by-step outline as to how the inspection as well as any needed follow-up actions is to take place. Additionally, the City has updated a previously developed standard Inspection Form using the EPA Municipal Separate Storm Sewer System (MS4) Program Evaluation Guidance Manual. The new form is used and filled out by all of the Inspectors conducting inspections of industrial facilities. The Inspection Form contains an extensive checklist including the following:

- Review of the Stormwater Pollution Prevention Plan (SWPPP)
- Review and inspection of all activities both inside and outside of the facility
- Observations at all stormwater outfalls
- SCMs are reviewed and their effectiveness assessed
- History of any spills or leaks are reviewed
- Photographs are taken of the facility and its activities

Industrial inspections are conducted on a priority basis. Those industries with the greatest potential to cause environmental harm and impact the quality of stormwater runoff are assigned a higher priority and inspected before others. The Stormwater Inspector completes an industrial site inspection checklist report as described above for each site inspected. The inspection checklist information is transferred to an Excel spreadsheet as a permanent record. For the time period July 1, 2018 to June 30, 2019, the City inspected all 25 of the facilities on the above referenced inventory. If problems are noted during the inspection, the facility is notified of the deficiencies and instructed to make the necessary improvements in order to achieve compliance. The compliance status of such facilities is indicated as "pending" in the inventory to note that the facility will need to be re-inspected at a later date to determine compliance.

During this reporting year, Stormwater inspected Valley Proteins, an EPA Section 313 facility within the City's permit jurisdiction. This facility is located on Martindale Drive. Valley Proteins was inspected on March 25, 2019 and was found to be in compliance with its Certificate of Coverage. Valley Proteins is also considered an EPA Section 313 facility due to its

containment measures for the bulk storage of its chemicals. Inlet protection was the only good housekeeping suggestion made. All chemical storage is properly stored and kept out of the way as to prevent illegal discharge to the storm drainage system. This property will continue to be inspected by the City in the future to ensure continued compliance.

As a supplement to the industrial inspections and in a continuing effort to improve local water quality, the City has continued with inspecting local area restaurants to make sure that they are practicing good housekeeping in particular in the disposal of their cooking waste byproducts (grease). Similar to the industrial inspections, the Stormwater Inspector completes a site inspection checklist report for each restaurant inspected. The inspection checklist information is transferred to an Excel spreadsheet as a permanent record. If the restaurant is found to be in non-compliance, the inspector will issue a Notice of Violation, and provide guidance on how the problem can be remedied. For the time period July 1, 2018 to June 30, 2019, the City inspected 475 restaurants. There were a few restaurants that were found to be deficient in good housekeeping practices. The issues found were trash on the ground, leaking tallow bins, and grease on the ground. In each instance, the Stormwater Inspector worked with the restaurant to have the incident corrected. In 13 instances, a Notice of Violation was issued. Restaurants were given a period of time to clean up the issues, and all complied to avoid fines being assessed.

When restaurant facilities are inspected, the Stormwater Inspectors provide them with educational materials and notify the owners of educational and training resources available to them through the City. Additionally, if any unresolved issues are found, a notice of violation (NOV) and possible fine can be issued.

During this reporting year, Stormwater staff attended a Food Truck Exposition where Staff sat on a panel and set up a booth to help educate food truck owners on the importance of having the proper equipment in place to prevent spills and stormwater pollution. There were several food truck owners in attendance. This was the second year that Stormwater has attended this exposition. It is Stormwater's goal to educate and develop relationships with business owners so that the risk of grease spills and illicit discharges to the system are reduced.

9.3 Evaluation Measures

During an industrial inspection, the Stormwater Inspector conducts visual monitoring of the receiving waters at the industrial discharge point. The Inspector checks to see if the discharge has an abnormal color, any odor, or sheen on the surface. The inspector also collects a sample of the discharge for visual observation and to determine if any substances are suspended in the water column. If necessary, photographs are taken of the outfall. If evidence of polluted runoff is suspected, a sample of the discharge is collected and further analyzed by an approved independent local laboratory for a number of pollutant parameters. If pollutants are verified in the runoff, the City notifies the facility immediately and requires actions to be taken to remedy the situation.

As a supplement to the major outfall inspections described earlier in Section 5.3 "Inspection/Detection Program" of this Annual Report, the City also monitors and inspects outfalls (12 inches and larger) associated with industrial activities to make sure that they are not discharging any potential pollutants to the City's storm drainage system or to Waters of the State. Similar to the major outfall inspections, the Stormwater Inspector completes an outfall inspection

checklist report for each industrial outfall inspected. The inspection checklist information is transferred to an Excel spreadsheet as a permanent record. For the time period July 1, 2018 to June 30, 2019, the City inspected 38 industrial outfalls. Some minor maintenance issues such as heavy sediment in catch basins, erosion and ditch line maintenance were noted. No other significant water quality issues were observed.

Section 10: Water Quality Assessment and Monitoring

10.1 Water Quality Assessment and Monitoring Plan

The City's current Water Quality Assessment and Monitoring Plan was reviewed and approved by the NC Division of Water Quality via a June 12, 2013 email. The Plan details monitoring activities, parameters, and data assessment required by the Permit. The Plan specifies water quality monitoring activities to be performed on a quarterly basis at a total of six (6) stream sites on major watersheds in the City. Monitoring is conducted for chemical and physical parameters on a fixed interval monitoring basis. A specific day of each calendar quarter (specifically, the 2nd Wednesday of the first month of each calendar quarter) is targeted for monitoring at each monitoring location. Additionally, the samples will be collected approximately 72 hours (48 to 96 hours) after rainfall has ceased. This will allow the streams to return to their normal dry weather flow depth following the rainfall.

Table 10-1 on the following page provides a list of the water quality parameters sampled at the monitoring sites.

Stormwater staff maintains a Sample Collection Guidance Manual for the Water Quality Assessment and Monitoring Program. The document outlines detailed procedures and consistent methods required to obtain samples for the quarterly ambient in-stream monitoring program.

Table 10-1: Water Quality Monitoring Parameters

Parameter	Sample Type	Frequency
Temperature	In-situ	Quarterly
Turbidity	In-situ	Quarterly
Dissolved Oxygen	In-situ	Quarterly
pH	In-situ	Quarterly
Conductivity	In-situ	Quarterly
Total Suspended Solids	Grab	Quarterly
Total Nitrogen	Grab	Quarterly
Total Kjeldahl Nitrogen	Grab	Quarterly
Ammonia (NH3)	Grab	Quarterly
NO_2 + NO_3	Grab	Quarterly

Total Phosphorous	Grab	Quarterly
Chromium (Cr)	Grab	Quarterly
Copper (Cu)	Grab	Quarterly
Lead (Pb)	Grab	Quarterly
Zinc (Zn)	Grab	Quarterly
Fecal Coliform	Grab	Quarterly

Table 10-2 below contains a description and location of the six (6) monitoring sites in the Monitoring Plan.

Table 10-2: Description of City of Fayetteville Water Quality Monitoring Sites

Site	Stream	Location
BLT	Blounts Creek	Culvert at Campbell Avenue
XCK	Cross Creek	Culvert at Hillsboro Street
BVR	Beaver Creek	Bridge at Cumberland Road
BCK	Buckhead Creek	Culvert at Coventry Road
LRC	Little Rockfish Creek	Bridge at Lakewood Drive
CCK	Carvers Creek	Culvert at Ramsey Street and I-295

Figure 10-1 shows a map and location of the six (6) monitoring sites within the Monitoring Plan.

Figure 2-1: Fayetteville Jurisdiction and Drainage Basins

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MPDES Permit No. NCS000246 - Stormwater Plan

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Figure 10-1: Fayetteville Water Quality Monitoring Sites

10.2 Water Quality Monitoring Implementation

Stormwater has continued the in-stream ambient water quality monitoring program initiated in the fall of 2005 when four sites located along Blounts Creek, Cross Creek, Beaver Creek, and Buckhead Creek were chosen for in-stream ambient water quality monitoring. These sites were selected to avoid potential duplication of other monitoring activities by NCDEQ, Fayetteville Public Works Commission (PWC), the Middle Cape Fear River Basin Association, and the US Geological Survey (USGS).

In 2010, Stormwater evaluated the in-stream ambient water quality monitoring program and compared it to the program in Charlotte, North Carolina. As a result of that evaluation and to get a better picture of the overall water quality throughout the City of Fayetteville, the City added two new sampling locations to the previous four locations and started collecting samples in August of 2010. The two newer sites are located along Little Rockfish Creek and Carvers Creek. With the addition of the two locations, water quality samples are now collected and analyzed in each of the major watersheds in the City. Figure 10-1 shows the location of the six monitoring sites. During this reporting year, Stormwater was able to collect samples from each of the six sites on a quarterly basis. The results of the in-stream ambient water quality monitoring program are shown in Figure 10-2 for the fiscal year 2018-2019.

The parameters shown in the top portion of the table are collected and reported in the field during the sample collection. The parameters shown in the middle of the table are reported from the laboratory following the analysis of the sample. The parameters shown in the bottom of the table are observations made by the field personnel during sample collection.

In reviewing the results from last year (see Figure 10-2), we observe that some indication of pollution is present at each of the six in-stream monitoring stations. In an urban setting, this is to be expected. Pollutants of concern include Nutrients (as indicated by Nitrogen and NO_2+NO_3) and Fecal Coliform. These parameters are detected in many of the samples. Also, elevated levels of Turbidity and Total Suspended Solids were observed in particular in Beaver Creek during the January 2019 sampling event. This may be attributable to increased construction in the Fayetteville area due to an improving economy and large transportation projects. The Stormwater Program will pay close attention to this and coordinate with the local office of the NCDEQ Land Quality Section who administers the City's Construction Site Runoff program.

CITY OF FAYETTEVILLE AMBIENT STREAM MONITORING RESULTS - 2018-2019 ANNUAL REPORT																												
	BLOUNTS CREEK				CROSS CREEK				BEAVER CREEK				BUCKHEAD CREEK				LITTLE ROCKFISH CREEK				CARVERS CREEK			
	BLT-001	BLT-002	BLT-003	BLT-004	XCK-001	XCK-002	XCK-003	XCK-004	BVR-001	BVR-002	BVR-003	BVR-004	BCK-001	BCK-002	BCK-003	BCK-004	LRC-001	LRC-002	LRC-003	LRC-004	CCK-001	CCK-002	CCK-003	CCK-004
SAMPLE DATE & TIME	7-16-18 @ 10:20	10-3-18 @ 9:30	1-8-19 @ 9:15	4-23-19 @ 10:20	7-16-18 @ 10:00	10-3-18 @ 9:14	1-8-19 @ 8:56	4-23-19 @ 9:23	7-16-18 @ 14:05	10-3-18 @ 10:30	1-8-19 @ 10:22	4-23-19 @ 11:21	7-16-18 @ 10:45	10-3-18 @ 9:51	1-8-19 @ 9:47	4-23-19 @ 10:50	7-16-18 @ 1:50	10-3-18 @ 10:20	1-8-19 @10:08	4-23-19 @ 11:08	7-16-18 @ 9:30	10-3-18 @ 8:35	1-8-19 @ 8:24	4-23-19 @ 8:56
Analyst	JO/ST	JO/ST	JO/NB	JO/NB	JO/ST	JO/ST	JO/NB	JO/NB	JO/ST	JO/ST	JO/NB	JO/NB	JO/ST	JO/ST	JO/NB	JO/NB	JO/ST	JO/ST	JO/NB	JO/NB	JO/ST	JO/ST	JO/NB	JO/NB
Hours since last rainfall	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+	72+
Air Temp, F.	78.3	74.8	58.3	70.5	75.7	74.8	58	69.7	84.3	74.8	57.5	67.8	78.4	75.5	58	69.1	88.1	73.4	56.4	68.8	75.6	75.5	61.8	68.4
Water Temp, F.	79.5	74.7	55.7	65.6	78.3	74.7	54	65.9	82	75.9	55.3	67.7	72.3	70.6	58	63.9	81.4	73.7	54.9	65.5	75.5	75.2	55	65
Turbidity, NTU	1.7	7	0.1	19	1.4	7.1	4.5	5.4	5.3	4.9	17.5	8	1.6	3.2	0	1.7	9.6	5.8	6.4	6.6	4.7	9.5	18.2	8.9
Dissolved Oxygen, %	6.6	7.38	9.18	8.7	5.1	7.13	10.05	6.9	5.18	5.85	8.25	5.63	7.03	6.33	7.6	7.08	6.2	5.66	7.7	5.96	4.24	6.1	10.2	8.9
PH	7.22	7	6.52	7.02	6.54	6.58	6.36	5.96	6.7	6.24	6.3	6.34	5.71	5.95	6.08	6.31	6.48	5.31	5.56	5.54	5.6	5.52	5.75	5.69
Conductivity, µmhos/cm^2	0.069	0.087	0.088	0.07	0.061	0.057	0.048	0.05	0.057	0.067	0.059	0.066	0.07	0.073	0.065	0.069	0.043	0.027	0.025	0.027	0.084	0.083	0.053	0.058
GRAB SAMPLE	BLT-001	BLT-002	BLT-003	BLT-004	XCK-001	XCK-002	XCK-003	XCK-004	BVR-001	BVR-002	BVR-003	BVR-004	BCK-001	BCK-002	BCK-003	BCK-004	LRC-001	LRC-002	LRC-003	LRC-004	CCK-001	CCK-002	CCK-003	CCK-004
Ammonia (NH3), mg/L	<0.0470	0.111	0.164	<0.180	0.0719	<0.0470	0.0693	<0.180	0.0525	0.0741	0.0955	<0.180	0.0669	<0.0470	<0.0470	<0.180	<0.0470	0.0477	<0.0470	<0.180	0.0887	0.0545	0.179	<0.180
Fecal Coliform	150	460	110	240	39	200	100	68	250	120	240	38	560	390	71	86	47	130	120	55	41	100	140	41
Total Nitrogen, mg/L	0.901	1.3631	1.961	1.1538	1.0922	0.865	1.6027	1.4419	1.8325	1.1301	1.8683	1.3497	3.6169	1.327	2.237	1.7808	0.9769	0.8637	1.7949	1.215	1.8377	0.9408	2.169	1.481
NO2+NO3, mg/L	0.254	0.3961	0.677	0.7538	0.1203	0.208	0.4134	0.6219	0.58	0.446	0.6528	0.8897	1.76	1.18	1.21	1.5708	0.3299	0.206	0.3479	0.475	0.249	0.2763	0.31	0.491
Total Phosphorous, mg/L	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.019	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085
TSS, mg/L	2	7.17	3.50	14.2	2.67	6.83	3.00	4.5	2.83	4.17	7.83	5.0	2	5.17	1.50	1.2	4.58	10.00	5.17	7.14	5.28	9	11.00	6.94
TKN, mg/L	0.6	0.92	1.12	0.22	0.9	0.61	1.12	0.64	1.2	0.61	1.12	0.28	1.79	<0.100	0.98	0.03	0.6	0.61	1.4	0.56	1.5	0.61	1.68	0.81
Chromium (Cr), mg/L	0.001	0.0033	0.00348	0.002	0.001	0.00339	0.00214	0.002	0.001	0.00309	0.00214	0.003	<0.001	0.00286	0.00244	0.003	0.001	0.00345	0.00228	0.003	0.001	0.00348	0.00237	0.003
Copper (Cu), mg/L	0.00175	0.0019	0.00199	0.002	0.00249	0.00149	0.00146	0.002	0.00162	0.00191	0.0021	0.002		0.00109	0.00164	0.002	0.00164	0.00155	0.00477	0.002	<0.00100	0.00147	0.00167	0.002
Lead (Pb), mg/L	<0.002	<0.0050	0.000981	<0.008	<0.002	<0.00500	0.00078	<0.008	<0.002	<0.00500	0.00114	<0.008	<0.002	<0.00500	0.000795	<0.008	<0.002	<0.00500	0.00083	<0.008	<0.002	<0.00500	0.000671	<0.008
Zinc (Zn), mg/L	0.01	0.0235	0.017	0.013	0.006	0.0137	0.008	0.006	<0.005	0.0119	0.008	0.006	0.014	0.0181	0.016	0.013	<0.005	0.0109	<0.002	<0.002	<0.005	0.0108	0.005	0.007
OBSERVATIONS	BLT-001	BLT-002	BLT-003	BLT-004	XCK-001	XCK-002	XCK-003	XCK-004	BVR-001	BVR-002	BVR-003	BVR-004	BCK-001	BCK-002	BCK-003	BCK-004	LRC-001	LRC-002	LRC-003	LRC-004	CCK-001	CCK-002	CCK-003	CCK-004
Oil Sheen	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Foam	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No
Litter & Trash	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
Dead Fish	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Live Fish	No	No	No	No	Yes	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	No	No	No
Dead Amphibians	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Live Amphibians	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	Yes	Yes	No	Yes
Crayfish	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Water bugs (insects)	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	No	No	Yes	Yes	No	No
Mussels	Yes	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Algal growth	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No
Color of Water	Clear	Clear	Clear	Clear/Cloud	Clear	Clear	Clear	Clear	Cloudy	Cloudy	Muddy	Murky	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Stained	Clear
Odor of Water	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Illicit Discharge?	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Figure 10-2: Ambient Instream Monitoring Results

Impaired Streams Program

Stormwater developed an Impaired Streams Program to monitor streams that have been classified as impaired within the City limits in 2014. In many cases, it is possible that an impaired stream could progress negatively overtime, and may have a Total Maximum Daily Load (TMDL) assigned to them to improve their water quality. In order to be proactive, Stormwater has developed this program on a voluntary basis to monitor impaired streams and make necessary adjustments to improve their water quality prior to the potential issuance of a TMDL.

This program will allow Stormwater to assess the effect pollutants may have on streams, as well as determine how the streams are impacted by their surrounding environments. Stormwater uses several methods to analyze the health of a stream, such as analytical laboratory sampling, field sampling, site inspections, and walking the stream. The Stormwater Program samples for 20 to 32 parameters at each sample site depending on what related issues are found during the inspection. These methods allow staff to assess both the chemical and biological conditions of a stream. Information obtained through sampling and inspection is then recorded on an Excel Spreadsheet. Using the spreadsheet, staff will be able to analyze the results overtime to determine patterns and possible pollution issues within a stream.

The Stormwater Program identified the sample sites based on stream segments that the state has deemed as impaired, along with input from the PWC Watersheds Group, to ensure that there is no duplication of sample sites. From these efforts, 20 sample sites were identified. This program allows Stormwater to understand the characteristics of our impaired streams.

Previously, Stormwater staff developed a Standard Operating Procedure (SOP) for inspecting and collecting sampling data from our designated impaired stream segments. The document outlines the City's efforts to monitor and reduce pollutants in local streams classified as impaired by NCDEQ. The written document is also highly effective in showing procedural consistency and the process when audited by DENR and EPA. While there are no TMDLs currently assigned to the City, the collected data and a validated process will be great tools and provide historical information to hopefully avoid or at least delay future TMDLs in the local area.

Section 11: Total Maximum Daily Loads (TMDLs)

The Stormwater Program has determined that a Total Maximum Daily Load (TMDL) has not yet been developed and approved or established by EPA for the receiving waters of the City of Fayetteville's MS4 NPDES stormwater discharge. Therefore, this Permit section is currently not applicable in the City of Fayetteville.

Section 12: Miscellaneous Stormwater Activities

During the reporting year, Stormwater has participated in several activities to help promote stormwater initiatives and support research for stormwater quality projects. These activities are listed below.

Urban Water Consortium

Stormwater is an active member of the Urban Water Consortium group of the Water Resources Research Institute. This group was established in 1985 to provide a program of research and development, and technology transfer on water resource issues shared by urban areas across the state. Through this group, WRRI and the State of North Carolina help individual facilities and regions solve problems related to local environmental or regulatory circumstances. Stormwater actively participates due to the importance of sharing information with other municipalities that face the same challenges as Fayetteville, as well as recognizing the importance of research and funding of stormwater quality related projects. The group meets quarterly in different locations around the state.

Stormwater Association of North Carolina (SWANC)

Stormwater is an active member of SWANC, which is a statewide organization that advocates for the interests of stormwater programs at the NC General Assembly and the NC Department of Environmental Quality(DEQ). Staff continues to be active with the Publicity committee, as well as attending most of the quarterly meetings.

Section 13: Plans for the Upcoming Year

The City continues through its Stormwater Program to implement the provisions of its 2018 issued permit. In moving forward, the City looks to accomplish the following in the coming year:

- Continue to implement the Water Quality Assessment and Monitoring Plan.
- Continue to train City Employees using the Online Stormwater Training Module.
- Continue to update the Stormwater Inventory with stormwater structures and conveyances that were constructed during and after the field data collection.
- Complete recovery efforts from Hurricane Matthew to include repair of a creek bank failure next to a City facility and repair of a City maintained dam.
- Continue to implement provisions from the renewed 2019 permit.
- Update the Stormwater Management Plan based on the renewed Stormwater Permit.
- Continue moving forward with a citywide Stormwater Watershed Master Plan.

This past year marked the ninth year that the City of Fayetteville has operated its own independent stormwater program, permit, and utility that initially started with the previous joint City / County stormwater program, permit, and utility that ceased as of July 1, 2009. The upcoming year will mark the twenty-third year that the City of Fayetteville has been covered by a NPDES Municipal Stormwater Discharge Permit.

In order to provide adequate funding to meet the requirements of the NPDES stormwater program, the Stormwater Program the City collects a stormwater utility fee of $72.00 per year per equivalent residential unit (ERU). There was no fee increase requested for the Fiscal Year 2020 year. The fee supports the NPDES permit compliance, campital infrastructure improvements, and the development of a citywide stormwater watershed masterplan.

Should any additional information be required, please contact:

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