City of Charlotte

NPDES MS4 Permit Program

Stormwater Management Program Plan

FY2023 Annual Report

CHARLOTTE SM

Permit Number NCS000240

October 2023

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Section 1: Introduction

On November 1, 1993, the City of Charlotte ("City") began operating under National Pollutant Discharge Elimination System ("NPDES") Municipal Separate Storm Sewer System ("MS4") Permit Number NCS000240. This permit has subsequently been renewed for a 5-year permit term on four occasions and is currently in its 5th permit cycle effective October 10, 2018 through October 9, 2023.

This document provides the Annual Report for the Stormwater Management Program Plan ("SWMP") for fiscal year ("FY") 2023 under the current permit term as required by Part III, paragraph 2 and Part IV, paragraph B of the NPDES MS4 permit. The overall objective of this Annual Report is to document activities conducted in support of the SWMP during FY2023 (July 1, 2021 to June 30, 2023), assess program effectiveness, and discuss future proposed program activities and/or SWMP changes as necessary.

Charlotte Storm Water Services ("CSWS") is the primary agency responsible for managing the City's NPDES MS4 permit, the MS4 system and the SWMP. The implementation of the requirements within the permit program and SWMP are coordinated with other applicable City departments as necessary. In addition, coordination is conducted with the NPDES MS4 permit programs for the jurisdictions in Mecklenburg County adjacent to the City where appropriate and feasible. This coordination is conducted to help ensure uniformity between the local NPDES MS4 stormwater permit programs and jurisdictions. Mecklenburg County stormwater staff along with CSWS staff collectively form Charlotte-Mecklenburg Storm Water Services ("CMSWS"). City and County surface water quality staff within CMSWS work together to accomplish many of the activities discussed in this annual report.

Included in this SWMP Annual Report are:

- Best management practice(s) ("BMPs") that are being used to fulfill the program requirements;
- Measurable goals; and
- Program results

Staff of CSWS, under the direction of the City's Surface Water Quality and Environmental Permitting Program Manager, is responsible for the fulfillment of most of the activities discussed in this SWMP. Exceptions to this include the CSWS-Land Development Team ("CSWS-LD"), which was the primary group during FY2023 responsible for the Development and Redevelopment Plan Review and Construction Site Stormwater Runoff Control programs within the SWMP. In addition, the City's Department of Transportation-Street Maintenance Division and Solid Waste Services Department have responsibility for routine maintenance of certain portions of the MS4, in coordination with CSWS. Funding for the BMPs specified in the SWMP is provided by local stormwater utility fees, except where noted.

Section 2: Background Information

2.1 Population Served

The SWMP covers the jurisdictional area, including the incorporated area and extra territorial jurisdiction (ETJ), for the City of Charlotte, as applicable and defined by the NPDES MS4 permit. **Table 2-1** provides the population for the City of Charlotte based on the 2010 and 2020 US census.

Table 2-1: Population and Growth Rate for the City of Charlotte.

2022 Population (estimated)	2020 Population	2010 Population	Average Annual Percent Change (2010-2020)
897,720	874,579	731,424	1.95%

2.2 Growth Rate

Table 2-1 shows the population growth rate represented as an "Average Annual Percent Change" for the City of Charlotte. This growth rate was calculated by dividing the overall percent change between the 2010 and 2020 Census data by the 10-year interval period.

2.3 Jurisdictional and MS4 Service Areas

The jurisdictional and MS4 service area for the City is provided in **Table 2-2**. The source of this information is the City of Charlotte Planning, Design and Development Department, which updates jurisdictional and geographical boundaries as annexations occur.

Table 2-2: Jurisdictional and MS4 Service Area for the City of Charlotte.

Incorporated Area (Sq. Miles)	ETJ (Sq. Miles)	Total Jurisdiction (Sq. Miles)
310	67	377

2.4 MS4 Conveyance System

The existing MS4 serving the City is composed of street curbs, gutters, catch basins, culverts, pipes, ditches, and outfalls that collect and convey stormwater for discharge to receiving streams. Maintenance and improvements to the MS4 system are funded by stormwater utility fees collected within the City. Maintenance activities include cleaning inlets of debris and sediment, maintaining channels to reduce erosion and maximize pollution reduction capabilities, and the removal of blockages. Improvements to the MS4 system include solving infrastructure problems, channel stabilization, safety improvements, stream habitat enhancement, surface water quality enhancement, and resolving flooding problems associated with stormwater generated from public streets.

Section 3: Public Education and Outreach Program

During the annual report period, the Public Education and Outreach Program distributed educational information to the community and conducted outreach activities focused on the impacts of stormwater discharges on water bodies. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measurable goals; and
- Program results.

3.1 BMP Summary Table

Table 3-1 provides information concerning the BMPs implemented to fulfill the Public Education and Outreach Program requirements.

Table 3-1: BMP Summary Table for the Public Education and Outreach Program.

BMP	Measurable Goals	Implementation Status for Annual Report Period
Describe target pollutants and target pollutant sources	Describe the target pollutants and target pollutant sources the permittee's public education program is designed to address and why they are an issue.	Yes - Implemented
Describe target audiences	Describe the target audiences likely to have significant stormwater impacts and why they were selected.	Yes - Implemented
Informational Web Site	The permittee shall promote and maintain an internet web site designed to convey the program's message.	Yes - Implemented
Distribute public education materials to identified user groups.	Distribute general stormwater educational material to appropriate target groups as likely to have a significant stormwater impact.	Yes - Implemented
Promote and maintain Hotline/Help line	Promote and maintain a stormwater hotline(s) or helpline(s) for the public to request information about stormwater, public involvement & participation, and to report illicit connections & discharges, etc.	Yes - Implemented
Implement a Public Education and Outreach Program.	The permittee's outreach program, including those elements implemented locally or through a cooperative agreement, shall include a combination of approaches designed to reach the target audiences. For each media, event, or activity the permittee shall estimate and record the extent of exposure.	Yes - Implemented

3.2 Target Pollutants and Sources

Table 3-2 provides the specific target pollutants and sources determined by the City for the annual report year.

Table 3-2: Targeted Pollution Sources for the Public Education and Outreach Program.

Target Pollutant	Pollution Source	Issue
Bacteria	Improper Waste Disposal Sanitary Sewer Overflows Pet Waste	Many surface waters in Charlotte are impaired due to high fecal coliform levels. Improper handling and disposal of wastes can result in the discharge of a variety of pollutants to the storm drainage system, causing increases in harmful bacteria. Discharges of food wastes such as fats, oils, and greases to the sanitary sewer system can result in line blockages that cause sanitary sewer overflows. Improper disposal of pet waste can also cause discharges of bacteria to the storm drainage system.
Sediment	Construction Erosion Stream Bank Erosion	Many surface waters in Charlotte are impaired due to turbidity related to sediment discharges. Improper erosion control practices at construction sites can result in sediment discharges to the storm drainage system. In addition, uncontrolled volumes of stormwater runoff can cause scouring of stream banks resulting in increased sediment volumes in streams.

3.3 Target Audiences

Based on the target pollutants and sources, the City determined the following target audiences for the annual report period:

Bacteria-related

- Multi-Family Residential Communities (sewer overflows);
- Commercial Sectors (improper waste disposal; also targets other pollutants); and
- Pet Owners (improper pet waste disposal).

Sediment-related

- Construction Industry (construction erosion).

General pollution information

- School-aged Children; and
- Diverse and under-represented audiences.

3.4 Informational Website

A significant number of resources are utilized to promote and maintain the City's website Stormwater.CharMeck.org which continues to be one of the best ways to provide the public with surface water quality information. **Table 3-3** shows the number of website advertisements, impressions, page views, and the number of unique page views.

Table 3-3: Website Program Results

Activity	Results
Website advertisements run	120
Website advertising media impressions	9,480,266
Website page views	465,097
Website unique page views	191,600

3.5 Public Education Materials

This outreach mechanism is used to target specific pollution sources associated with the public and industrial/commercial facilities such as lawn care practices, handling of used oil and other automotive wastes, good housekeeping techniques, etc. **Table 3-5** shows the number of environmental notices/brochures distributed for the annual report period.

3.5.1 Promotional Items

Promotional items are designed and distributed to complement outreach activities such as group presentations, workshops and public events. All promotional items have the stormwater website and may include other messages, such as the reporting hotline, as space allows. **Table 3-4** shows the promotional items distributed.

Table 3-4: Promotional Items

Promotional Item	Message
Ink Pens	Six rotating messages – report pollution, street to stream, volunteer, turn around don't drown, flooding can happen anywhere, buy flood insurance
Umbrella Rain Gauge	General stormwater information; Stormwater.CharMeck.org
Flashlight	General stormwater information; Stormwater.CharMeck.org
Sunscreen	General stormwater information; Stormwater.CharMeck.org
Stormy's Guide to Stormwater Coloring Book	General stormwater information; Stormwater.CharMeck.org
Hand Sanitizer	Stormwater.CharMeck.org
Stormy Stickers & Temporary Tattoos	General stormwater information; Stormwater.CharMeck.org
Boat Towels	General stormwater information; Stormwater.CharMeck.org; Report pollution by calling 311
Keychains	General stormwater information; Stormwater.CharMeck.org
Koozies	Stormwater.CharMeck.org
Pet Waste Dispensers	General stormwater information; Stormwater.CharMeck.org
Water Bottles	General stormwater information; Stormwater.CharMeck.org; Report pollution by calling 311

Promotional Item	Message
Color Changing Cups	General stormwater information; Stormwater.CharMeck.org; Report pollution by calling 311

3.5.2 Utility Bill Inserts

CMSWS includes utility bill inserts in various monthly water/sewer utility bills issued by the Charlotte Water (CLT-W) department. The inserts focus on various topics which typically include volunteering, surface water quality, flooding, infrastructure and CMSWS services and fee changes. **Table 3-5** shows the total number of stormwater related public educational materials distributed during the annual report period.

Table 3-5: Public Education Materials Program Results

Activity	Results
Environmental notices/brochures issued	279
Utility bill inserts (stormwater related) mailed	1,680,000

3.6 Public Reporting Mechanisms

The City, in cooperation with Mecklenburg County, operates a joint customer service hotline (311) to receive information about a variety of concerns. Citizens can call 311 to report pollution, flooding, and blockages. They can also submit requests for service to 311 using the CLT+ app or by going online to the "Report a Problem" section of the website.

Table 3-6 provides information about the number of callers that reported stormwater and surface water quality issues.

Table 3-6: Public Reporting Program Results

Activity	Results
CLT+ mobile app downloads	32,500
Public requests to hotline received (stormwater related)	751
Public requests to hotline (Surface Water Quality/Pollution related)	216

3.7 Stormwater Public Education and Outreach Program

The City's Stormwater Public Education and Outreach Program provides surface water quality and pollution prevention messages to educate residents and businesses about the ways they can help protect surface water quality and get involved to help reduce stormwater pollution. The program provides these messages in the following ways:

- Mass Media;
- Social Media;
- School Presentations;
- Public Presentations and Events;
- Website;

- Public Education Materials; and
- Special Campaigns and Programs.

3.7.1 Mass Media

Significant resources are spent on providing surface water quality messages through mass media channels because they are one of the most effective ways to reach adult audiences. **Table 3-7** shows the data relative to these media channels for the annual report period.

Table 3-7: Mass Media and Social Media Program Results

Activity	Results
Television advertising spots run	215
Radio advertising spots run	345
Television advertising media impressions	5,680,000
Radio advertising media impressions	923,300
Facebook fans	8,474
Instagram followers	1,376
Twitter followers	1,550
YouTube page subscribers	307
Social media posts made	945
Total Social media engagements (likes, replies, comments, shares)	218,324

3.7.2 Social Media

CMSWS continues efforts to build a social media presence as more and more people are receiving information through this media source. Four social media channels used by CMSWS are shown in **Table 3-8.**

Table 3-8: Social Media Channels

Social Media Account	Name	Handle	URL
Facebook	CMSWS	@StormWaterCM	https://www.facebook.com/StormWaterCM
Twitter	CMSWS	@StormWaterCM	https://twitter.com/StormWaterCM
Instagram	CMSWS	@StormWaterCM	https://www.instagram.com/stormwatercm/
YouTube	CMSWS	N/A	https://www.youtube.com/user/StormWaterServices

3.7.3 School Presentations

During FY2023, CMSWS reached out via e-mail blasts and social media posts to inform teachers about available stormwater educational programs and presentations. **Table 3-8** shows the data relative to the school presentations for the annual report period.

3.7.4 Public Presentations and Workshops

A variety of surface water quality presentations and workshops are available from CMSWS to the public, interest groups, businesses and industrial facilities upon request. **Table 3-8** shows the data relative to the public presentations for the annual report period.

3.7.5 Public Events

CMSWS staff participates in a variety of community events that are used to promote education campaigns, give away promotional products, provide face-to-face education opportunities, and provide formal presentations on surface water quality topics when appropriate. **Table 3-8** shows the data relative to public event participation for the annual report period.

Table 3-8: Presentation and Event Program Results

Activity	Results
School presentations conducted	81
Students educated at school presentations	2,319
Public presentations conducted	29
Residents educated at public presentations	1,319
Public events participated in	10
Residents interacted with at public events	1,440

3.7.6 Special Campaigns and Programs

Pet Waste Campaign: CMSWS conducts a "Scoop the Poop" awareness campaign that targets pet owners as a way to educate them about surface water quality impacts from pet waste and the importance of cleaning it up. CMSWS also attends pet focused events and distributes items such as pet waste bags that carry messaging that encourages residents to scoop the poop and report pollution.

Vehicle Wraps: Vehicle wraps are a unique outreach tool for publicizing stormwater and surface water quality issues. There are currently graphic wraps on five vehicles which staff drive around while conducting work. The wraps serve to make a connection between clean water and healthy aquatic life; address the street to stream connection; smelly streams; and mud pollution.

Stormy Mascot: CMSWS uses the mascot "Stormy the Turtle" in various education and outreach materials and in appearances at various events including parades, photo shoots, and festivals. **Table 3-9** shows the data relative to this program for the annual report period.

Creek Week: CMSWS participates in a nationwide program called Creek Week in order to bring more attention to the importance of creeks in the community. CMSWS partners with several other governmental and non-profit organizations to develop and market events that tie into the overall surface water quality theme. **Table 3-9** shows the data relative to this program for the annual report period.

Regional Stormwater Partnership of the Carolinas (RSPC): CSWS is a member of the RSPC which is currently a partnership of 22 municipal stormwater agencies that work collaboratively on stormwater issues. Resources are pooled to help members achieve MS4 permit requirements with a particular emphasis on public education and outreach.

Table 3-9: Special Campaign and Activity Program Results

Activity	Results
Stormy Mascot appearances at events	5
Creek Week events held	16
RSPC public education TV & radio impressions (estimated)	794,494
RSPC public education TV & radio advertising spots	794

3.8 Program Results

The BMPs shown in **Table 3-1** for the Public Education and Outreach Program were successfully implemented during the annual report period. Discussion in Section 3 provides more detailed information about implementation efforts. **Table 3-10** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 3-10: Program Data Summary

PUBLIC EDUCATION PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023
Advertising spots (TV and Radio)	924	731	663	502	**560**
Advertising media impressions (TV and Radio)	6,063,651	6,970,584	4,160,065	2,616,544	**6,603,300**
Utility bill inserts (stormwater related)	1,330,520	1,530,000	1,407,000	1,413,615	**1,680,000**
Social Media Followers/Subscribers	8,927	9,340	10,054	10,596	**11,707**
Social media posts	620	648	986	922	**945**
Social media responses from public[1.]	1,045	1,240	14,819	129,197	**686,177**
Public requests to hotline (stormwater related)	8,934	9,104	7,810	7,653	**751**
Public requests to hotline (SWQ related)	553	605	445	440	**216**
Presentations (non-school)	135	55	29	36	**29**
Persons educated at presentations (non-school)	3,492	2,088	1,211	1,174	**1,319**
Public events	33	8	5	8	**10**
Citizens interacted with at public events	3,970	1,860	50	745	**1,440**
Website page views	376,617	381,610	417,437	426,455	**465,097**

1. FY2019 - 2020 data reported as social media public comments only. FY2021 - 2023 data included comments, replies, likes, and shares due to the upgraded method that the social media management platform used to report the data.

Section 4: Public Involvement and Participation Program

During the annual report period, the Public Involvement and Participation Program provided opportunities for the public to participate in program development and implementation per the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measurable goals; and
- Program results.

4.1 BMP Summary Table

Table 4-1 provides information concerning the BMPs implemented to fulfill the Public Involvement and Participation Program requirements.

Table 4-1: BMP Summary Table for the Public Involvement and Participation Program.

BMP	Measurable Goals	Implementation Status for Annual Report Period
Volunteer community involvement program	The permittee shall include and promote volunteer opportunities designed to promote ongoing citizen participation.	Yes - Implemented
Establish a Mechanism for Public involvement	The permittee shall provide and promote a mechanism for public involvement that provides for input on stormwater issues and the stormwater program.	Yes - Implemented
Establish Hotline/Help line	The permittee shall promote and maintain a hotline/helpline for the purpose of public involvement and participation.	Yes - Implemented
Public Review and Comment	The permittee shall make copies of their most recent Stormwater Plans available for public review and comment.	Yes - Implemented
Public Notice	Pursuant to 122.34 the permittee must, at a minimum, comply with State, Tribal and local public notice requirements when implementing a public involvement/ participation program.	Yes - Implemented

4.2 Volunteer Involvement Program

4.2.1 Storm Drain Marking Program (SDM)

This program enables volunteers to adhere vinyl printed markers to storm drains along streets they select in their neighborhoods. **Table 4-2** shows the data relative to this program for the annual report period.

4.2.2 Adopt-A-Stream Program (AAS)

This program allows for volunteers to "adopt" segments of streams and agree to walk them, picking up trash and reporting any pollution problems found along the way. **Table 4-2** shows the data relative to this program for the annual report period.

4.2.3 The Big Spring Clean

The Big Spring Clean is a one-day annual event promoted by CMSWS and the local organization Keep Mecklenburg Beautiful. **Table 4-2** shows the data relative to this program for the annual report period.

Table 4-2: SDM, AAS, and Big Spring Clean Program Results

Activity	Results
Storm drains marked	1,159
Storm Drain Marking volunteers	228
Storm Drain Marking volunteer hours	296
Adopt-A-Stream groups	163
Adopt-A-Stream clean-ups	133
Adopt-A-Stream volunteers	2,304
Adopt-A-Stream volunteer hours	4,906
Adopt-A-Stream miles cleaned	125
Adopt-A-Stream trash collected (lbs.)	60,063
Big Spring Clean volunteers	135
Big Spring Clean volunteer hours	405
Big Spring Clean stream miles cleaned	3
Big Spring Clean trash collected (lbs.)	5,275

4.2.4 Volunteer Monitoring

The Volunteer Monitoring Program includes Visual Assessments, Snapshot Assessments, and stream sampling. Visual assessments and Snapshot Assessments allow trained volunteers to quickly assess stream conditions and report problems. Stream monitoring allows volunteers to collect and analyze surface water samples. **Table 4-3** shows the data relative to this program for the annual report period.

4.2.5 Second Saturday and VolunThursday Volunteer Events

The "Second Saturday" events take place usually on the second Saturday of every month and VolunThursday events take place one Thursday per month during lunchtime which allows people who are typically busy on weekends to volunteer. **Table 4-3** shows the data relative to this program for the annual report period.

4.2.6 Tree Planting Program

The City and CMSWS maintain various tree planting programs where citizens can volunteer to plant and maintain trees on select public property and project sites. This effort helps to stabilize soil and reduce stormwater runoff and pollution. **Table 4-3** shows the data relative to this program for the annual report period.

4.2.7 Adopt-A-Street Program

The City's Keep Charlotte Beautiful program maintains an Adopt-A-Street program where residents can volunteer to adopt a section of roadway to remove trash and litter. **Table 4-3** shows the data relative to this program for the annual report period.

Table 4-3: Public Involvement Program Results

Activity	Results
Volunteer Monitoring participants	785
Volunteer Monitoring participant hours	1,053
Volunteer Monitoring samples collected	74
Volunteer Monitoring visual observations made	43
Second Saturday & VolunThursday total events	18
Second Saturday & VolunThursday volunteers	364
Second Saturday & VolunThursday volunteer hours	866
Second Saturday & VolunThursday Events – Stream Clean-ups	13
Second Saturday & VolunThursday trash collected (lbs.)	17,291
Second Saturday & VolunThursday Events – Tree Maintenance	2
Second Saturday & VolunThursday Events – Storm Drain Marking	2
Second Saturday & VolunThursday Events – Rain Garden Maintenance	1
Tree planting volunteers	79
Tree planting volunteer hours	200
Trees planted by volunteers	590
Adopt-A-Street volunteers	4,757
Adopt-A-Street volunteer hours	9,521
Adopt-A-Street miles cleaned	631
Adopt-A-Street bags of trash collected	4,692
Adopt-A-Street bags of recyclables collected	266
SWAC meetings	5
Attendees at SWAC meetings	78

4.3 Public Involvement Mechanism

The City of Charlotte and Mecklenburg County maintain a citizen Storm Water Advisory Committee (SWAC) which serves as the City's stormwater management citizen advisory panel for involving the public in the development and implementation of the permit program. **Table 3** shows the data relative to this program for the annual report period.

4.4 Public Reporting and Information Mechanisms

The City, in cooperation with Mecklenburg County, operates a joint customer service hotline (311) to receive information about a variety of concerns and provide information about various services. Citizens can call 311 to report pollution, flooding, and blockages as well as submit requests for service to 311 using the CLT+ app or by going online to the "Report a Problem" section of the website. Information about public involvement and participation can also be obtained by calling 311. Additional information is discussed in Section 3.6.

4.5 Public Review and Comment Opportunities

The City provides opportunities for public review and comment on the implementation of its NPDES MS4 permit and SWMP plan through website information. One of the other main opportunities for public review and comment is through the SWAC which is discussed in Section 4.3.

4.6 Public Notice

During the annual report period the City issued a public notice related to the Unified Development Ordinance adoption process which includes post-construction and construction stormwater regulations.

4.7 Program Results

The BMPs shown in **Table 4-1** for the Public Involvement and Participation Program were successfully implemented during the annual report period. Discussion in Section 4 provides more detailed information about implementation efforts. **Table 4-4** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 4-4: Program Data Summary

PUBLIC INVOLVEMENT PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023
Total Volunteers	3,859	3,533	5,185	8,494	**4,047**
Total Volunteer hours	16,019	12,277	10,747	19,414	**7,943**
Total miles cleaned by volunteers (linear miles of street & stream)	612	569	516	734	**147**
Total tons trash collected by volunteers (from streams & street)	72	51	52	85	**45**
SWAC meetings	9	8	11	11	**5**
Attendees at SWAC meetings	167	158	73	96	**78**

Section 5: Illicit Discharge Detection and Elimination (IDDE) Program

During the annual report period, staff implemented the Illicit Discharge Detection and Elimination ("IDDE") program to identify and eliminate sources of pollution to the MS4 per the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measurable goals; and
- Program results.

5.1 BMP Summary Table

Table 5-1 provides information concerning the BMPs implemented to fulfill the IDDE Program requirements.

Table 5-1: BMP Summary Table for the Illicit Discharge Detection and Elimination Program.

BMP	Measurable Goals	Implementation Status for Annual Report Period
Maintain appropriate legal authorities	Maintain adequate ordinances or other legal authorities to prohibit illicit connections and discharges and enforce the approved IDDE Program.	Yes - Implemented
Maintain a Storm Sewer System Base Map	The permittee shall maintain a current map showing major outfalls and receiving streams.	Yes - Implemented
Inspection / detection program to detect dry weather flows at MS4 outfalls	Maintain written procedures and/or Standard Operating Procedures (SOPs) for detecting and tracing the sources of illicit discharges and for removing the sources or reporting the sources to the State to be properly permitted. Written procedures and/or SOPs shall specify a timeframe for monitoring and how many outfalls and the areas that are to be targeted for inspections.	Yes - Implemented
Employee Training	Conduct training for appropriate municipal staff on detecting and reporting illicit connections and discharges.	Yes - Implemented
Maintain a public reporting mechanism	Maintain and publicize reporting mechanism for the public to report illicit connections and discharges. Establish citizen request response procedures.	Yes - Implemented
Documentation	The permittee shall document the date of investigations, any enforcement action(s) or remediation that occurred.	Yes - Implemented

5.2 Ordinance Administration and Enforcement

The City's Stormwater Pollution Control Ordinance (SWPCO) continues to be implemented as part of the NPDES MS4 permit program and SWMP. **Table 5-2** shows the data relative to the SWPCO program for the annual report period.

Table 5-2: SWPCO Program Results

Activity	Results
Total NOVs issued	119
Total Enforcement Actions issued	14

5.3 Stormwater System Inventory and Storm System Base Map

The City collects stormwater system inventory using a Stormwater Inventory Program and a Stream Walk Program. The data is used in GIS to create base maps as necessary. **Table 5-3** shows the data relative to the stormwater system inventory program for the annual report period.

5.4 IDDE Manual and Procedures

The City maintains an IDDE Manual to ensure proper implementation of the program. The manual is supported by several associated Standard Operating Procedures (SOPs) that provide detailed information to staff for conducting program activities.

Table 5-3: Stormwater Inventory Program Results

Activity	Results
Stream-walk stream miles assessed	220
New outfalls identified	136
Existing outfalls QA/QC'd	723
Pipe miles inventoried	51.08
Open drainage miles inventoried	20.66
Stormwater features inventoried	13,827

5.5 Employee IDDE Training and Education

Employee IDDE Training and Education involves training municipal employees about the detection of illicit connections and discharges, and the various methods for reporting suspected pollution problems. **Table 5-4** shows the data relative to this program for the annual report period.

Table 5-4: Employee IDDE Training/Education Program Results

Activity	Results
Total staff trained on IDDE	2,592
On-site training presentations and tailgate training sessions at municipal facilities	20
Employees trained at on-site sessions	665
Facilities assigned on-line training sessions	18
Staff trained via on-line training module	327
Staff trained via other methods	1,600

5.6 Public Reporting Mechanisms

The City, in cooperation with Mecklenburg County, operates a joint customer service hotline (311) to receive information about a variety of concerns. Citizens can call 311 to report pollution, flooding, and blockages as well as submit requests for service to 311 using the CLT+ app or by going online to the "Report a Problem" section of the website. Additional information is discussed in Section 3.6.

5.7 Illicit Discharge Detection and Elimination Program and Documentation

5.7.1 Outfall Inspection and Dry Weather Flow Detection

Each year select sub-basin outfalls are inspected for physical condition, the presence of dry weather flows (DWFs), and illicit discharges. These inspections are primarily conducted during Stream Walks, Hot Spot Investigations, and facility inspections. **Table 5-5** shows the data relative to the outfall inspection and DWF detection program for the annual report period.

Table 5-5: Outfall Inspection and DWF Program Results

Activity	Results
Total outfalls inspected	883
DWFs detected	157
DWFs sampled	11
Fecal Coliform samples collected	11
Total Phosphorus samples collected	8
Fecal Coliform results requiring follow-up investigation	3
Stream blockages detected/reported	57
Other potential issues detected	55

5.7.2 Surface Water Quality Monitoring

The two main monitoring programs used to support IDDE efforts are the Fixed Interval and CMANN stream monitoring programs. The Fixed Interval program conducts in-stream monitoring for various chemical and physical parameters on a monthly basis and is discussed further in Section 10. The CMANN program is an automated monitoring network that takes in-stream readings every 60 minutes at select monitoring sites for dissolved oxygen, temperature, pH, conductivity, and turbidity. Data collected by the monitoring probes are sent through telemetry technology to computers and staff receive alerts when programmed pollutant thresholds are exceeded. Staff are then able to investigate suspected pollution issues.

5.7.3 Illicit Discharge Elimination Program

The Illicit Discharge Elimination Program ("IDEP") is a sub-set of the overall IDDE program. Staff conducts proactive illicit discharge detection, investigation and outreach activities in areas where data and staff experience indicate the greatest likelihood for the occurrence of illicit discharges and/or poor housekeeping practices. **Table 5-6** shows the data relative to this program for the annual report period.

5.7.3.1 Water Line Repair Impact Assessment

Due to the potential for MS4 and surface water impacts downstream of municipal water line repair locations, this project seeks to assess impacts both qualitatively, through observation, and quantitatively, through sample collection and analysis. **Table 5-6** shows the data relative to this program for the annual report period.

Table 5-6: IDEP Program Results

Activity	Results
Multi-family community inspections conducted	23
Watershed basin inspections conducted	22
Municipal Water Line Repair Assessments conducted	10
Inspections at previous SWPCO civil penalty facilities	25

5.7.4 Sanitary Sewer Overflows and Septic System Discharges

CMSWS works with two separate City/County departments to reduce sources of bacteria from municipal system SSOs and private septic systems: Charlotte Water (CLT-W) department and Mecklenburg County Groundwater and Wastewater Services.

5.7.4.1 Multi-Family Residential Program

The IDDE multi-family program includes:

- Maintaining a master list of multi-family communities;
- Compiling a list of 50 priority communities for inspection annually;
- Informational letters sent to priority list of multi-family residential communities; and
- Education of multi-family community staff to help them comply with the regulations;

Table 5-6 shows the data relative to this program for the annual report period.

5.7.4.2 Septic Systems

CMSWS works with Mecklenburg County Groundwater and Wastewater Services (GWWS) each year to monitor discharges from septic systems. **Table 5-8** shows the data relative to this program for the annual report period.

Table 5-8: Septic System Program Results

Activity	Results
Total failing septic systems discovered	21
Failing septic systems connected to municipal sanitary sewer system	16
Failing septic systems repaired	5

5.7.5 Public Education and Outreach

The City maintains a public education and outreach program to inform businesses, industries and the public about illicit discharges and improper waste disposal and how they impact the environment. This education and outreach program includes instructions regarding the proper method for reporting illicit discharges.

5.7.5.1 Commercial Sector Education and Outreach

The City has created best practices guidance documents for many commercial sectors based on problems revealed through data including service requests, illicit discharges, violation notices, and staff observations. The documents are available online and staff provide them to businesses during service requests and inspections.

During FY2023, because data analysis showed a significant number of illicit discharges associated with multi-family communities, staff created a new best practices guidance document

for the communities as it relates to stormwater pollution. This document along with a cover letter were mailed to many local multi-family communities. **Table 5-9** shows the data relative to this program for the annual report period.

Table 5-9: Commercial Sector Education Program Results

Activity	Results
Multi-family Community BMP mailers issued	619

5.7.5.2 Service Requests and Documentation

The 311-call center refers calls for stormwater general, structural, and flooding concerns to CSWS while surface water quality (SWQ) concerns are referred to CMSWS-LUESA. Responding to SWQ service requests continues to be one of the most important methods for detecting and eliminating illicit discharges and connections in the City.

5.8 Program Results

The BMPs shown in **Table 5-1** for the Illicit Discharge Detection and Elimination Program were successfully implemented during the annual report period. Discussion in Section 5 provides more detailed information about implementation efforts. **Table 5-9** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 5-9: Program Data Summary

IDDE PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023
SWPCO NOVs issued	125	124	100	118	**119**
SWPCO enforcement actions issued	11	13	7	13	**14**
Stream miles assessed	218	196	214	191	**220**
Outfalls inspected	1,237	802	474	732	**883**
Illicit discharges detected/corrected	282[2.]	262[2.]	245[2.]	259	**226**
SWQ Service requests/reported problems	553	605	445	440	**473**
Municipal employee IDDE onsite training sessions and facilities assigned online module	86	54	81	49	**38**
Employees trained on IDDE	1,993	1,692	1,870	2,631	**2,592**

Section 6: Construction Site Stormwater Runoff Control Program

During the annual report period, the Construction Site Stormwater Runoff Control program conducted site evaluations and enforced the local ordinance per the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measurable goals; and
- Program results.

6.1 BMP Summary Table

Table 6-1 provides information concerning the BMPs implemented to fulfill the requirements of the Construction Site Stormwater Runoff Control Program. Funding for the BMPs in this section is covered by local land development fees.

Table 6-1: BMP Summary Table for the Construction Site Stormwater Runoff Control Program.

BMP	Measurable Goals	Implementation Status for Annual Report Period
Erosion and Sediment Control Program	The permittee has a delegated Sediment and Erosion Control Program. As such, to the extent authorized by law, the permittee is responsible for compliance with the Sediment Pollution Control Act of 1973 and Chapter 4 of Title 15A of the North Carolina Administrative Code. The delegated Sediment and Erosion Control Program effectively meets the maximum extent practicable (MEP) standard for Construction Site Runoff Controls by permitting and controlling development activities disturbing one or more acres of land surface and those activities less than one acre that are part of a larger common plan of development as authorized under the Sediment Pollution Control Act of 1973 and Chapter 4 of Title 15A of the North Carolina Administrative Code.	Yes - Implemented
Develop requirements for construction site operators	The NCG010000 permit establishes requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality, as part of the Permittee's delegated program.	Yes - Implemented
Public information and reporting	The permittee shall provide and promote a means for the public to notify the appropriate authorities of observed erosion and sedimentation problems. The permittee may implement a plan promoting the existence of the NCDEQ, Division of Land Resources "Stop Mud" hotline to meet the requirements of this paragraph.	Yes - Implemented
Plan reviews	Implement construction site plan reviews as part of the Permittee's delegated program. For new development and redevelopment projects to be built within the permittee's planning jurisdiction by entities with eminent domain authority, the permittee shall, to the maximum extent practicable, coordinate the approval of the construction site runoff control with the Division of Land Resources of NCDEQ.	Yes - Implemented

6.2 Erosion and Sediment Control Program

The City operates a delegated Sediment and Erosion Control program under authority granted by the North Carolina Sedimentation Commission. The "City of Charlotte – Soil Erosion and Sedimentation Control Ordinance (SESCO)," amended and adopted by City Council in 2008, serves as the backbone of the program.

6.3 Construction Site Requirements

The program requires that all land disturbing activities comply with ordinance requirements for controlling erosion and sediment on site. As an additional requirement, and in compliance with NPDES regulations, all construction sites one acre or greater must have an approved soil erosion and sediment control plan designed specifically for the site as required by NPDES General Permit NCG010000 for Construction Related Activities.

6.4 Public Information and Reporting

The City's Erosion Control Program maintains a website to assist with the dissemination of information to the development community and the public. In addition, the City, in cooperation with Mecklenburg County, operates a joint customer service hotline (311) to receive information about a variety of concerns. Citizens can call 311 to report pollution, flooding, and blockages as well as submit requests for service to 311 using the CLT+ app or by going online to the "Report a Problem" section of the website. **Table 6-3** shows the data relative to this program for the annual report period.

6.4.1 Education and Training Materials

The City maintains an education and training program for developers, contractors and other interested parties within the region. **Table 6-2** shows the data relative to this program for the annual report period. In-person training sessions were not conducted during FY2023.

In addition, developers, builders and responsible parties receive handouts and materials at preconstruction meetings and at other times as necessary to explain ordinance requirements, minimum standards and other relevant information for the financially responsible party and/or site operators.

Table 6-2: CMCSI Training Program Results

Activity	Results
Total persons trained by program	228
Persons trained on-line	228

6.5 Plan Reviews

All land disturbing activities one acre or greater are required to obtain approval of the soil erosion and sediment control plan prior to scheduling a preconstruction conference. Erosion control plans submitted by the applicants are reviewed and approved by CSWS-LD erosion control staff.

6.6 Program Results

The BMPs shown in **Table 6-1** for the Construction Site Stormwater Runoff Control Program were successfully implemented during the annual report period. Discussion in Section 6

provides more detailed information about implementation efforts. **Table 6-3** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 6-3: Program Data Summary

CONSTRUCTION SITE RUNOFF PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023
SESCO NOVs issued	51	41	35	55	**55**
SESCO civil penalties issued	60	31	20	27	**32**
Site inspections conducted	3,513	4,902	5,044	5,100	**5,119**
Service requests/reported problems	500	550	510	505	**337**
CMCSI training sessions (in-person)	3	2	0[3.]	0[3.]	**0**
Persons trained on CMCSI	349	339	257	339	**228**
Project/site plans reviewed	1,254	1,030	1,293	1,617	**1,378**

3. In-person training not conducted due to Covid-19 pandemic.

Section 7: Post-Construction Stormwater Management Program

During the annual report period, the City implemented its Post-Construction Stormwater Management program in accordance with the Post-Construction Stormwater Ordinance ("PCSO") and program administrative manual. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measurable goals; and
- Program results.

7.1 BMP Summary Table

Table 7-1 provides information concerning the BMPs implemented to fulfill the requirements of the Post-Construction Stormwater Management Program. Funding for the BMPs in this section is covered by local stormwater utility fees and land development fees.

Table 7-1: BMP Summary Table for the Post-Construction Stormwater Management Program.

BMP	Measurable Goals	Implementation Status for Annual Report Period
Post-Construction Stormwater Management Program	Maintain an ordinance (or similar regulatory mechanism) and program to address stormwater runoff from new development and redevelopment.	Yes - Implemented
Strategies which include BMPs appropriate for the MS4	Maintain strategies that include a combination of structural and/or non-structural BMPs implemented in concurrence with ordinance above. Provide a mechanism to require long-term operation and maintenance of structural BMPs. Require annual inspection reports of permitted structural BMPs performed by a qualified professional.	Yes - Implemented

Deed Restrictions and Protective Covenants	The permittee shall provide mechanisms such as recorded deed restrictions and protective covenants so that development activities maintain the project consistent with approved plans.	Yes - Implemented
Operation and Maintenance Plan	The developer shall provide the permittee with an operation and maintenance plan for the stormwater system, indicating the operation and maintenance actions that shall be taken, specific quantitative criteria used for determining when those actions shall be taken, and who is responsible for those actions. The plan must clearly indicate the steps that shall be taken and who shall be responsible for restoring a stormwater system to design specifications if a failure occurs and must include an acknowledgment by the responsible party. Development must be maintained consistent with the requirements in the approved plans and any modifications to those plans must be approved by the Permittee.	Yes - Implemented
Educational materials and training for developers	Provide educational materials and training for developers. New materials may be developed by the permittee, or the permittee may use materials adopted from other programs and adapted to the permittee's new development and redevelopment program.	Yes - Implemented

7.2 Post-Construction Stormwater Management Program

The City's post-construction program is designed to meet the stormwater management and surface water quality protection requirements of North Carolina Administrative Code at 15A 02H Sections .0126, .0150 - .0154 (NPDES) and at 15A 02H Section .1000 (Stormwater Management) to address post-construction stormwater runoff from new development and applicable redevelopment projects as required by the NPDES MS4 permit program and as allowable under current State law. The City PCSO covers the entire jurisdictional area (incorporated and ETJ areas) of the City and includes provisions for enforcement remedies and civil penalties to ensure compliance. **Table 7-2** shows the data relative to this program for the annual report period.

7.3 Post-Construction BMP Strategies

Structural BMP strategies for the City's Post-Construction Stormwater Management program consist mainly of structural stormwater control measure(s) ("SCMs") such as sand filters, wet ponds, wetlands, and bioretention areas. **Table 7-2** shows the data relative to this program for the annual report period.

7.4 Deed Restrictions and Protective Covenants

As part of the PCSO program, the City requires deed restrictions and protective covenants to ensure that development projects remain consistent with approved plans. Stream and buffer boundaries are required to be specified on all surveys and record plats. An operation and maintenance agreement for SCMs is required to be referenced on record plats and recorded in deeds.

7.4.1 Setbacks for Built-Upon Areas

The PCSO program requires a minimum of 30-foot buffers on all perennial and intermittent streams draining less than 50 acres, and incrementally increased required buffer widths up to 100-feet for streams draining 640 acres or more. These buffers are recorded on record plats as noted in sub-section 7.4.

7.5 Operation and Maintenance Plan

The PCSO program requires an operation and maintenance agreement executed by the responsible party (owner) of each stormwater control measure (SCM).

CSWS conducts annual inspections of SCMs to ensure proper operation and maintenance and compliance with the PCSO. **Table 7-2** shows the data relative to this program for the annual report period.

7.6 Education and Training Program

The City implements an education and training program designed to provide developers, designers, and site owners with the information necessary to comply with the City's Post-Construction Stormwater Ordinance. **Table 7-2** shows the data relative to this program for the annual report period.

7.7 Program Results

The BMPs shown in **Table 7-1** for the Post-Construction Stormwater Management Program were successfully implemented during the annual report period. Discussion in Section 7 provides more detailed information about implementation efforts. **Table 7-2** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 7-2: Program Data Summary

POST-CONSTRUCTION PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023
PCSO NOVs/CARs issued[4.]	948	933	711	834	**249**
PCSO civil penalties issued	0	4	7	8	**3**
Site plans reviewed	126	157	162	255	**282**
SCMs added by development	112	90	144	137	**120**
SCM inspections conducted[5.]	1,600	1,600	1,440	1,630	**1,486**
PCSO training sessions	1	1	1	1	**1**
Persons trained on PCSO[6.]	128	74	124	195	**184**

4. Includes NOVs and Corrective Action Requests (CARs); and notice of maintenance and report due letters to remind the property owner that a yearly inspection report is due.

5. Includes Post-Construction and Peak Detention SCMs inspected.

6. Number includes only attendees at workshops. Others were educated about aspects of the Post-Construction program through phone calls, website, meetings, and other methods.

Section 8: Pollution Prevention/Good Housekeeping Program

During the annual report period, inspection, training, and program development activities were conducted for municipal facilities and operations as part of the Pollution Prevention and Good Housekeeping Program per the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measurable goals; and
- Program results.

8.1 BMP Summary Table

Table 8-1 provides information concerning the BMPs implemented to fulfill the requirements of the Pollution Prevention & Good Housekeeping Program.

Table 8-1: BMP Summary Table for the Pollution Prevention/Good Housekeeping Program.

BMP	Measurable Goals	Implementation Status for Annual Report Period
Operation and maintenance program for municipal facilities and operations.	Maintain and implement an operation and maintenance program for municipal facilities owned and operated by the permittee that have been determined by the permittee to have significant potential for generating polluted stormwater runoff that has the ultimate goal of preventing or reducing pollutant runoff.	Yes - Implemented
Site Pollution Prevention Plans for municipal facilities and operations.	Maintain and implement Site Pollution Prevention Plans for municipal facilities owned and operated by the permittee that have been determined by the permittee to have significant potential for generating polluted stormwater runoff that has the ultimate goal of preventing or reducing pollutant runoff.	Yes - Implemented
Inspection and evaluation of municipal facilities and operations.	Maintain an inventory of municipal facilities and operations owned and operated by the permittee that have been determined by the permittee to have significant potential for generating polluted stormwater runoff, including the MS4 system and associated structural SCMs, conduct inspections at facilities and operations owned and operated by the permittee for potential sources of polluted runoff, the stormwater controls, and conveyance systems, and evaluate the sources, document deficiencies, plan corrective actions, implement appropriate controls, and document the accomplishment of corrective actions.	Yes - Implemented
Spill Response Procedures municipal facilities and operations.	Maintain spill response procedures for municipal facilities and operations owned and operated by the permittee that have been determined by the permittee to have significant potential for generating polluted stormwater runoff.	Yes - Implemented
Prevent or Minimize Contamination of Stormwater Runoff from all areas used for Vehicle and	Describe measures that prevent or minimize contamination of the stormwater runoff from all areas used for vehicle and equipment cleaning, including fire stations that serve more than three fire trucks and ambulances. Perform all cleaning operations indoors, cover the cleaning operations, ensure wash water drains to the sanitary sewer system, collect stormwater runoff from the cleaning area and	Yes - Implemented

Equipment Cleaning	providing treatment or recycling, or other equivalent measures. If sanitary sewer is not available to the facility and cleaning operations take place outdoors, the cleaning operations shall take place on grassed or graveled areas to prevent point source discharges of the wash water into the storm drains or surface waters. Where cleaning operations cannot be performed as described above and when operations are performed in the vicinity of a storm drainage collection system, the drain is to be covered with a portable drain cover during cleaning activities. Any excess standing water shall be removed and properly handled prior to removing the drain cover. Facilities that serve three or fewer fire trucks and ambulances and that cannot comply with these requirements shall incorporate structural measures during facility renovation.	
Streets, roads, and public parking lots maintenance	The permittee shall evaluate BMPs to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots within the corporate limits. Within 12 months of permit issuance, the permittee must update its Stormwater Plan to include the BMPs selected.	Yes - Implemented
Streets, roads, and public parking lots maintenance	Within 24 months of permit issuance, the permittee must implement BMPs selected to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots identified by the permittee in the Stormwater Plan.	Yes - Implemented
Operation and Maintenance (O&M) for municipally-owned or maintained structural SCMs and the storm sewer system (including catch basins, the conveyance system, and structural stormwater controls).	Within 12 months of permit issuance, the permittee shall develop and implement an operation and maintenance program for structural SCMs and the storm sewer system (including catch basins, the conveyance system, and structural stormwater controls).	Yes - Implemented
Staff training	Maintain and implement a training plan that indicates when, how often, who is required to be trained and what they are to be trained on.	Yes - Implemented

8.2 Operation and Maintenance Program

Operation and maintenance of municipal facilities with regards to stormwater is primarily managed through implementation of Stormwater Pollution Prevention Plan(s) (“SWPPPs”) and the municipal facility inspection program.

8.3 Municipal Facility Stormwater Pollution Prevention Plans

SWPPPs are developed for all applicable municipal facilities listed in the SWMP. The SWPPPs are reviewed and updated annually with all documentation kept in the SWPPPs, including site maps.

8.4 Municipal Facility Inventory and Site Inspections

All parcels of land owned or operated by the City continue to be examined to determine whether they should be included in the Municipal Facilities Inventory within the Pollution Prevention/Good Housekeeping Program. **Table 8-2** shows the data relative to this program for the annual report period.

Table 8-2: Municipal Facility Program Results

Activity	Results
New City owned parcels reviewed for inventory	22
Municipal facility inspections conducted	32
SWPPP reviews conducted	32
Spill Prevention & Response Plan reviews conducted	32

8.5 Municipal Spill Response Procedures

Spill prevention and response procedures (SPRPs) are maintained for all facilities (and associated field operations) listed in the SWMP.

8.6 Vehicle and Equipment Cleaning Operations

Municipal employees wash the majority of vehicles and equipment at commercial or municipal vehicle wash facilities that drain to the sanitary sewer system. Vehicle and equipment washing at municipal facilities continue to be assessed during annual inspections at facilities listed in the SWMP, where applicable.

8.7 Streets, Roads, and Public Parking Lots Maintenance

The City implements the following practices to address polluted stormwater runoff from these sources, as shown below:

- Street sweeping program;
- Adopt-A-Street program;
- Leaf and yard waste collection program;
- Trash receptacles along downtown streets;
- Trash receptacles and litter control activities at Park and Ride parking lots; and
- Public education to address polluted stormwater runoff from municipally-owned streets and public parking lots.

Table 8-3 shows the data relative to this program for the annual report period.

Table 8-3: Streets/Roads and Parking Maintenance Program Results

Activity	Results*
Streets/roads swept (miles)	12,406
Streets/roads sweeping debris removed (lbs.)	2,433,780
Yard waste collected (tons)	43,790
Adopt-A-Street miles cleaned	631
Adopt-A-Street bags of trash collected	4,692
Adopt-A-Street bags of recyclables collected	266

8.8 Municipal SCMs and MS4 System Operation and Maintenance

The City maintains an inventory of municipal structural SCMs which are inspected for proper operation and maintenance at various frequencies based on the type of SCM. The inventory continues to be updated as new SCMs are constructed. Routine maintenance activities for these SCMs include:

- Mowing;
- Trash removal;
- Woody growth removal;
- Cattail removal; and
- Inlet and outlet clearing.

The City also conducts extensive cleaning and maintenance of the MS4 system which includes, but is not limited to:

- Catch basin cleaning (manually and with vacuum trucks);
- Storm drain top cleaning;
- Curb and gutter cleaning;
- Culvert/channel cleaning;
- Drainage structure installation and repair;
- Ditch reshaping; and
- Erosion control.

Table 8-4 shows the data relative to this program for the annual report period.

Table 8-4: Stormwater System Maintenance Program Results

Activity	Results
Catch basins top cleaned (surface grates, inlets, etc.)	27,868
Catch basins cleaned (entire catch basin vacuumed out)	725
Municipal SCMs in inventory	251
Municipal SCM inspections conducted	194
Municipal SCM maintenance activities conducted	22

8.9 Employee Staff Training at Municipal Facilities

Training is conducted for employees at all of the facilities listed in the SWMP. The goal of training is to inform employees of the actions necessary to reduce the discharge of pollutants from their facilities/operations and protect surface water quality. **Table 8-5** shows the data relative to this program for the annual report period.

Table 8-5: Municipal Facility Employee Training Program Results

Activity	Results
Training sessions conducted (in person)	23
Employees trained at sessions (in person)	786
Employees trained via on-line training module	433
Total employees trained	**1,219**

8.10 Program Results

The BMPs shown in **Table 8-1** for the Prevention and Good Housekeeping Program were successfully implemented during the annual report period. Discussion in Section 8 provides more detailed information about implementation efforts. **Table 8-6** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 8-6: Program Data Summary

MUNICIPAL GOOD HOUSEKEEPING PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023
New City-owned parcels reviewed for inventory	35	42	12	19	**22**
Municipal facilities inspected	32	33	53[7.]	54[8.]	**32**
Municipal operation program evaluations	17	14	1	2	**1**
O & M improvement recommendations made	72	78	91	82	**60**
Municipal facility employee in-person training sessions	86	18	43	50	**23**
Municipal facility employees trained	1,993	1,008	1,156	1,253	**1,219**

7. FY2021 inspections included 20 municipal fire stations which are only inspected once per permit term
8. FY2022 inspections included 22 municipal fire stations which are only inspected once per permit term

Section 9: Program to Monitor and Control Pollutants in Stormwater Discharges to Municipal Systems

During the annual report period, inspection and monitoring activities were conducted under the Program to Monitor and Control Pollutants in Stormwater Discharges to Municipal Systems per the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measurable goals; and
- Program results.

9.1 BMP Summary Table

Table 9-1 provides information concerning the BMPs implemented to fulfill the requirements of the Industrial Facilities Program.

Table 9-1: BMP Summary Table for the Program to Monitor and Control Pollutants in Stormwater Discharges to Municipal Systems.

BMP	Measurable Goals	Implementation Status for Annual Report Period
Maintain an Inventory of Industrial Facilities	Maintain an inventory of permitted hazardous waste treatment, disposal, and recovery facilities, industrial facilities that are subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), industrial facilities identified with an industrial activity permitted to discharge stormwater to the permittee's MS4, or as identified as an illicit discharge under the IDDE Program. For the purposes of this permit, industrial activities shall mean all permitted industrial activities as defined in 40 CFR 122.26.	Yes - Implemented
Inspection Program	Identify priorities and inspection procedures. At a minimum, priority facilities include those identified above in subsection II.H.2.a.	Yes - Implemented
Evaluate Industrial Facilities discharging stormwater to the City's MS4	The Permittee is required to evaluate control measures implemented at permitted hazardous waste treatment, disposal, and recovery facilities, industrial facilities that are subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), industrial facilities identified with an industrial activity permitted to discharge stormwater to the permittee's MS4, or as identified as an illicit discharge under the IDDE Program. For permitted facilities, the municipality shall establish procedures for reporting deficiencies and non-compliance to the permitting agency. Where compliance with an existing industrial stormwater permit does not result in adequate control of pollutants to the MS4, municipality will recommend and document the need for permit modifications or additions to the permit issuing authority. For the purposes of this permit, industrial activities shall mean all permitted industrial activities as defined in 40 CFR 122.26. For the purpose of this permit, the Permittee is authorized to inspect the permitted hazardous waste treatment, disposal, and recovery facilities as an authorized representative of the Director.	Yes - Implemented

9.2 Industrial Facility Inventory

An inventory of industrial facilities is maintained showing those facilities that discharge to the City's MS4 and have the potential to discharge significant pollutant loads. Facilities included in the inventory fit into one or more of the following categories:

- Hazardous waste TSD facility;
- SARA Title III facility (TRI reporter);
- NPDES Stormwater permitted facility;
- Stormwater No Exposure Certificate facility;
- Industrial Wastewater Pre-Treatment permitted facility; and
- Facilities identified as having an illicit discharge under the IDDE Program.

9.3 Industrial Facilities Inspection Program

The purpose of the Industrial Facilities Inspection program is to evaluate activities at industrial facilities that may impact stormwater discharges and then work with identified problem facilities to reduce stormwater pollution from the facility. **Table 9-2** shows the data relative to this program for the annual report period.

Table 9-2: Industrial Facility Program Results

Activity	Results
Industrial facility inspections conducted	43
Vehicle maintenance facility inspections conducted	20
Industrial facilities monitored via runoff sampling	6

9.3.1 Industrial Facilities Monitoring Program

The purpose of the Industrial Facilities Monitoring Program is to monitor stormwater runoff from selected industrial facilities and identify and correct pollution sources related to industrial activities. **Table 9-2** shows the number of facilities monitored during wet weather conditions for the annual report period.

9.4 Evaluation Measures

The appropriate evaluation measures to reduce polluted discharges to the City's MS4 are industrial inspections and monitoring. Inspection letters note that the inspection is being conducted to satisfy both State and City NPDES MS4 permit requirements.

9.5 Program Results

The BMPs shown in **Table 9-1** for the Industrial Facilities and Monitoring Program were successfully implemented during the annual report period. Discussion in Section 9 provides more detailed information about implementation efforts. **Table 9-3** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 9-3: Program Data Summary

INDUSTRIAL FACILITIES PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023
Master industrial inspection inventory sites	514	515	514	517	**426**
Facilities inspected[9.]	63	62	60	61	**63**
Facilities monitored	12	9	8	8	**6**

9. This data is a combination of industrial facilities and vehicle maintenance facilities.

Section 10: Water Quality Assessment and Monitoring Program

During the annual report period, monitoring activities were conducted per the Water Quality Assessment and Monitoring program plan and the SWMP. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measurable goals; and
- Program results.

10.1 BMP Summary Table

Table 10-1 provides information concerning the BMPs implemented to fulfill the requirements of the Water Quality Assessment and Monitoring Program.

Table 10-1: BMP Summary Table for the Water Quality Assessment and Monitoring Program.

BMP	Measurable Goals	Implementation Status for Annual Report Period
Water Quality Assessment and Monitoring Plan	Maintain a Water Quality Assessment and Monitoring Plan. The Plan shall include a schedule for implementing the proposed assessment and monitoring activities.	Yes - Implemented
Water Quality Monitoring	Maintain and implement the Water Quality Assessment and Monitoring Plan submitted to DWQ.	Yes - Implemented

10.2 Water Quality Assessment and Monitoring Plan

The City implements the Water Quality Assessment and Monitoring Plan that specifies the basic surface water quality monitoring program and activities to be performed at specified stream sites within the major watersheds in the City.

10.3 Surface Water Quality Monitoring Implementation

The City conducts the fixed interval monitoring program at the monitoring sites listed in the plan. **Table 10-2** shows the data relative to this program for the annual report period.

10.4 Water Quality Assessment and Monitoring Plan Revisions

The City has reviewed the basic monitoring program plan and data generated during the annual report period and proposes no changes to the plan.

10.5 Program Results

The BMPs shown in **Table 10-1** for the Water Quality Assessment and Monitoring Program were successfully implemented during the annual report period. Discussion in Section 10 provides more detailed information about implementation efforts. **Table 10-3** shows a summary of the various items and corresponding data results for activities conducted under the program.

Table 10-2: Program Data Summary

SURFACE WATER QUALITY MONITORING PROGRAM	FY2019	FY2020	FY2021	FY2022	FY2023
Stream sites monitored	23	23	23	23	**23**
Stream samples collected	276	253	276	276	**276**
Laboratory sample analyses conducted	3,312	3,036	3,312	3,312	**3,312**
Stream physical measurements (DO, Temp, pH, Cond)	1,104	1,012	1,104	1,104	**1,104**

Section 11: Total Maximum Daily Load (TMDL) Program

The City continued to fulfill the NPDES MS4 permit requirements regarding the TMDL Program by implementing the following BMPs within the six minimum NPDES MS4 permit measures. The following sub-sections explain:

- The BMPs implemented to meet program requirements;
- Measurable goals; and
- Program results.

11.1 BMP Summary Table

Table 11-1 provides information concerning the BMPs implemented to fulfill the Total Maximum Daily Load (TMDL) Program requirements. These BMPs pertain to the City's existing TMDL watershed plan that was developed under the City's previous NPDES MS4 permit.

Table 11-1: BMP Summary Table for Total Maximum Daily Load (TMDL) Program.

BMP	Measurable Goals	Implementation Status for Annual Report Period
Identify, describe and map watershed, outfalls, and streams	Within 24 months the permittee shall prepare a plan that: • Identifies the watershed(s) subject to an approved TMDL with an approved Waste Load Allocation (WLAs) assigned to the permittee, • Includes a description of the watershed(s), • Includes a map of watershed(s) showing streams & outfalls • Identifies the locations of currently known major outfalls within its corporate limits with the potential of contributing to the cause(s) of the impairment to the impaired segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments and • Includes a schedule to discover and locate other major outfalls within its corporate limits that may be contributing to the cause of the impairment to the impaired stream segments, to their tributaries, and to segments and tributaries within the watershed contributing to the impaired segments.	Yes – BMP developed, implemented, and maintained as applicable during the annual report period per the City's TMDL watershed plan.
Existing measures	Within 24 months the Permittee's plan: • Shall describe existing measures being implemented by the Permittee designed to achieve the MS4's NPDES WLA and to reduce the TMDL pollutant of concern to the MEP within the watershed to which the TMDL applies; and • Provide an explanation as to how those measures are designed to reduce the TMDL pollutant of concern. • The Permittee shall continue to implement the existing measures until notified by DWQ.	Yes – BMP developed, implemented, and maintained as applicable during the annual report period per the City's TMDL watershed plan.
Assessment of available monitoring data	Within 24 months the permittee's plan shall include an assessment of available monitoring data. Where long-term data is available, this assessment should include an analysis of the data to show trends.	Yes – BMP developed, implemented, and maintained as applicable during the annual report period per the City's TMDL watershed plan.
Monitoring Plan	Within 36 months the permittee shall develop and submit to the Division a Monitoring Plan for the permittee's assigned NPDES regulated WLA as specified in the TMDL. The permittee shall maintain and implement the Monitoring Plan as additional outfalls are identified and as accumulating data may suggest. Following any review and comment by the Division the permittee shall incorporate any necessary changes to monitoring plan and initiate the plan within six months. Modifications to the monitoring plan shall be approved by the Division. Upon request, the requirement to develop a Monitoring Plan may be waived by the Division if the existing and proposed measures are determined to be adequate to achieve the MS4's NPDES WLA to MEP within the watershed to which the TMDL applies.	Yes – BMP developed, implemented, and maintained as applicable during the annual report period per the City's TMDL watershed plan.

Additional Measures	Within 36 months the permittee's plan shall: • Describe additional measures to be implemented by the permittee designed to achieve the permittee's MS4's NPDES WLA and to reduce the TMDL pollutant of concern to the MEP within the watershed to which the TMDL applies; and • Provide an explanation as to how those measures are designed to achieve the permittee's MS4's NPDES regulated WLA to the MEP within the watershed to which the TMDL applies.	Yes – BMP developed, implemented, and maintained as applicable during the annual report period per the City's TMDL watershed plan.
Implementation Plan	Within 48 months the permittee's plan shall: • Describe the measures to be implemented within the remainder of the permit term designed to achieve the MS4's NPDES WLA and to reduce the TMDL pollutant of concern to the MEP and • Identify a schedule, subject to DWQ approval, for completing the activities.	Yes – BMP developed, implemented, and maintained as applicable during the annual report period per the City's TMDL watershed plan.
Incremental Success	The permittee's plan must outline ways to track and report successes designed to achieve the MS4's NPDES regulated WLA and to reduce the TMDL pollutant of concern to MEP within the watershed to which the TMDL applies.	Yes – BMP developed, implemented, and maintained as applicable during the annual report period per the City's TMDL watershed plan.
Reporting	The permittee shall conduct and submit to the Division an annual assessment of the program designed to achieve the MS4's NPDES WLA and to reduce the TMDL pollutant of concern to the MEP within the watershed to which the TMDL applies. Any monitoring data and information generated from the previous year are to be submitted with each annual report.	Yes – BMP developed, implemented, and maintained as applicable during the annual report period per the City's TMDL watershed plan.

11.2 TMDL Watershed Plan

The City maintains a TMDL watershed plan for the applicable identified watersheds that are subject to an approved TMDL within the City's jurisdiction as defined in Part II, Sec J.1 and J.2 within the City's current NPDES MS4 permit. The plan is available for review on the City's website:
https://charlottenc.gov/StormWater/SurfaceWaterQuality/Documents/TMDL%20Watershed%20Plan%20FY2021%20-%20FINAL.pdf

11.2.1 TMDL Watershed Identification

Currently, there are seven approved TMDLs applicable to multiple streams in the City, some of which also include portions of Mecklenburg County. These are referenced in the City's TMDL watershed plan.

11.2.2 Outfall Identification for TMDL Watersheds

The City developed and maintains an existing outfall inventory for the applicable TMDL watersheds. This inventory is maintained using a GIS coverage to show existing outfalls within the TMDL watersheds. These are referenced in the City's TMDL watershed plan.

11.3 Identification of Existing Measures

The City identified existing programs and measures which are currently in use within the City's NPDES MS4 permit and surface water quality monitoring programs that are designed to address the assigned MS4 NPDES regulated waste load allocation stated in the TMDL. These are referenced in the City's TMDL watershed plan.

11.4 Assessment of Available Monitoring Data

Fixed interval surface water quality data collected from 2006 through 2023 was analyzed for all applicable TMDL watersheds and pollutants of concern in the City and County. These data help to illustrate surface water quality trends in relation to the NC surface water quality standards. These are referenced in the City's TMDL watershed plan.

11.5 Monitoring Plan for Assigned MS4 NPDES Regulated Waste Load Allocation

As part of the TMDL watershed plan the City developed a monitoring plan for each pollutant of concern with an assigned MS4 NPDES regulated WLA within each watershed with an approved TMDL within the City's jurisdiction. This is referenced in the City's TMDL watershed plan.

11.6 Identification of Additional Measures

The City identified additional measures for implementation within the City's MS4 permit program that are designed to achieve the assigned MS4 NPDES regulated WLA and to reduce the TMDL pollutant of concern to the MEP within the watershed to which the TMDL applies. These are referenced in the City's TMDL watershed plan.

11.7 Implementation of Additional Measures

The TMDL watershed plan was updated to discuss the implementation of the additional programs and measures identified in sub-section 11.6. These are referenced in the City's TMDL watershed plan.

11.8 Tracking Incremental Success

BMP data parameters were identified to track incremental success within the TMDL watershed plan. These parameters and corresponding data for the annual report period are shown in sub-section 11.10.

11.9 Program Results

The overall TMDL Program and Watershed Plan were successfully implemented during the annual report period. **Table 11-2** shows a summary of the various BMPs implemented and corresponding data results per TMDL watershed for the annual report period. BMPs that apply to the City or a program as a whole, such as television advertisements, cannot be differentiated by watershed and are therefore reported as "Citywide." Additional information concerning these BMPs is provided in the City's TMDL Watershed Plan.

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Table 11-2: TMDL Program Data Summary for FY2023

TMDL WATERSHED BMP	Citywide	Irwin	Lake Wylie	Little Sugar	Long	McAlpine	McKee	Steele	Sugar
Public Education and Outreach									
Television advertising spots	215								
Radio advertising spots	345								
Social media posts	945								
Social media engagements	686,177								
Public requests to stormwater hotline – SWQ related	216								
School presentations		5	0	13	0	23	0	4	6
Students educated at school presentations		108	0	319	0	599	0	70	125
Public presentations	29								
Citizens educated at public presentations	1,319								
Public events	10								
Attendees interacted with at public events	1,440								
Website page views	465,097								
Website unique page views	191,600								
Utility bill inserts		146,160	18,480	53,760	15,120	70,560	3,696	9,744	13,272
CMCSI education workshops conducted (in-person)	0								
Persons trained on CMCSI	0								
Environmental notices and brochures distributed	279								
Flow Free (Fats Oils & Grease-FOG) brochures distributed	5,583								
Flow Free (FOG) presentations	10								
Citizens educated during Flow Free (FOG) presentations	2,715								

TMDL WATERSHED BMP	Citywide	Irwin	Lake Wylie	Little Sugar	Long	McAlpine	McKee	Steele	Sugar
Public Involvement									
Storm drains marked		195	0	159	196	247	14	12	14
Adopt-A-Stream trash removed (lbs.)		13,680	2,000	23,493	869	8,874	0	440	1,835
Adopt-A-Stream miles cleaned		21	1	51	3	22	0	2	9
Big Spring Clean trash removed (lbs.)		1,035	0	2,240	0	745	0	0	0
Big Spring Clean stream miles cleaned		1	0	2	0	1	0	0	0
Volunteer Monitoring samples collected		10	0	20	0	33	0	1	1
Volunteer Monitoring visual observations		5	5	14	0	24	0	0	0
Trees planted during tree planting volunteer events	590								
Adopt-A-Street bags of trash collected	4,692								
Adopt-A-Street bags of recyclables collected	266								
Adopt-A-Street miles cleaned	631								

TMDL WATERSHED BMP	Citywide	Irwin	Lake Wylie	Little Sugar	Long	McAlpine	McKee	Steele	Sugar
Illicit Discharge Detection and Elimination (IDDE)									
Stream walk miles inspected		11	0	65	0	0	0	0	102
Stream walk outfalls inspected		70	0	349	0	0	0	0	356
Dry weather flows sampled		3	0	4	0	0	0	0	3
Multi-family sewer system inspections		2	0	16	0	14	0	0	6
Multi-family community mailers sent	50								
Stormwater pollution ordinance violations/NOVs issued		22	2	34	6	25	0	1	9
Stormwater pollution ordinance enforcements issued		4	0	3	1	1	0	0	2
Septic system failures detected/corrected		1	0	2	1	8	1	1	1
Municipal employees trained on IDDE	2,592								
IDEP priority basin inspections		5	0	3	0	9	0	0	1
IDEP outfall inspections		0	0	0	0	0	0	1	0
Citizen service requests responded to		59	5	143	30	94	2	12	41

TMDL WATERSHED BMP	Citywide	Irwin	Lake Wylie	Little Sugar	Long	McAlpine	McKee	Steele	Sugar
Construction Site Stormwater Runoff Control									
Erosion control ordinance NOVs issued	55								
Erosion control ordinance civil penalties issued	32								
Project/site plans reviewed	1,378								
Sites inspected	5,119								
Post-Construction Stormwater Management									
Post-Construction ordinance NOVs and CARs issued	249								
Post-Construction ordinance penalties issued	3								
Post-Construction education workshops conducted	1								
Citizens educated at Post-Construction workshops	184								
Project/site plans reviewed	282								
Buffer areas protected/added (acres)	426								
Buffer mitigation plans approved		0	0	2	1	2	0	0	0
SCMs added		10	7	29	5	11	0	17	10
SCMs inspected		2	88	49	144	45	17	80	56
Pollution Prevention/Good Housekeeping									
City facilities inspected		3	0	6	0	1	0	0	2
City facility outfalls inspected		13	0	29	0	8	0	0	17
Stormwater pollution prevention plans implemented		3	0	6	0	1	0	0	2
Spill prevention response plans implemented		3	0	6	0	1	0	0	2
Catch basins top cleaned	27,868								
Catch basins cleaned (entire basin)	725								
Street sweeping (miles swept)	12,406								
Street sweeping debris (lbs.)	2,433,780								
Yard waste collected (tons)	43,790								

TMDL WATERSHED BMP	Citywide	Irwin	Lake Wylie	Little Sugar	Long	McAlpine	McKee	Steele	Sugar
Industrial Facilities									
Industrial facilities inspected		22	2	11	2	2	0	5	10
Industrial facility outfalls inspected		34	11	10	5	0	0	8	13
Surface Water Quality Monitoring									
Fixed interval TSS samples collected		13	13	65	13	91	13	13	26
Fixed interval Turbidity samples collected		13	13	65	13	91	13	13	26
Fixed interval Dissolved Oxygen samples collected		12	12	12	12	12	12	12	12
Fixed interval Fecal Coliform samples collected		13	13	65	13	91	13	13	26
CMANN Turbidity observations/readings[1.]		30,110	21,988	81,119	9,331	59,603	7,786	6,524	35,054
CMANN Dissolved Oxygen observations/readings [1.]		32,907	21,591	76,998	12,303	55,744	12,313	7,065	38,165

1. CMANN is an automated monitoring network that collects data readings typically once per hour (select sites collect readings every 15 min.). Data reported is QA/QC accepted data only.
2. Includes Fixed Interval and CMANN program investigations.

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