

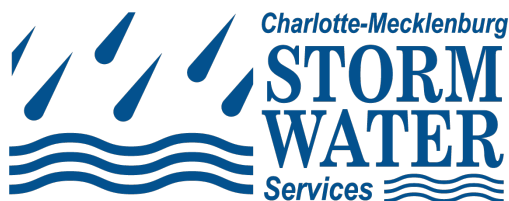
# ***Storm Water Management Program Assessment Report for Permit No. NCS000395***

***Reporting Period:  
July 1, 2021 through June 30, 2022***

***Co-Permittees:  
Mecklenburg County, Charlotte-Mecklenburg Schools, Central Piedmont  
Community College and the Towns of Cornelius, Davidson, Huntersville,  
Matthews, Mint Hill and Pineville***

***Report Date: October 2022***

***Report Prepared by:  
Charlotte-Mecklenburg Storm Water Services  
2145 Suttle Avenue  
Charlotte, NC 28208-5237***



## Table of Contents

Section 1:	Introduction.....	1
Section 2:	Overview and Funding.....	2
Section 3:	Stormwater Management Program Administration.....	3
3.1	Implementation Status for FY2022.....	3
Section 4:	Public Education and Outreach Program.....	6
4.1	Implementation Status for FY2022.....	6
4.2	Status of Improvements Identified for Implementation in FY2022.....	15
4.3	Improvements Identified for Implementation in FY2023.....	15
Section 5:	Public Involvement and Participation Program.....	17
5.1	Implementation Status for FY2022.....	17
5.2	Status of Improvements Identified for Implementation in FY2022.....	23
5.3	Improvements Identified for Implementation in FY2023.....	24
Section 6:	Illicit Discharge Detection and Elimination Program.....	25
6.1	Implementation Status for FY2022.....	25
6.2	Status of Improvements Identified for Implementation in FY2022.....	40
6.3	Improvements Identified for Implementation in FY2023.....	41
Section 7:	Construction Site Storm Water Runoff Control Program.....	42
7.1	Implementation Status for FY2022.....	42
7.2	Status of Improvements Identified for Implementation in FY2022.....	43
7.3	Improvements Identified for Implementation in FY2023.....	44
Section 8:	Post-Construction Site Runoff Control Program.....	46
8.1	Implementation Status for FY2022.....	46
8.2	Status of Improvements Identified for Implementation in FY2022.....	49
8.3	Improvements Identified for Implementation in FY2023.....	50
Section 9:	Pollution Prevention/Good Housekeeping for Municipal Operations.....	52
9.1	Implementation Status for FY2022.....	52
9.2	Status of Improvements Identified for Implementation in FY2022.....	57
9.3	Improvements Identified for Implementation in FY2023.....	57
Section 10:	Total Maximum Daily Loads (TMDLs).....	59
10.1	Implementation Status for FY2022.....	59
10.2	Status of Improvements Identified for Implementation in FY2022.....	59
10.3	Improvements Identified for Implementation in FY2023.....	60
Section 11:	Program Effectiveness.....	62
Section 12:	Program Enhancements for FY2023.....	63

## **Figures**

Figure 1: Percentage of Survey Respondents Aware that Stormwater Drains to Surface Waters	14
Figure 2: The Big Spring Clean Locations in FY2022.....	22
Figure 3: Number of Volunteers by Fiscal Year.....	23
Figure 4: Mecklenburg County Phase II Stream Monitoring Sites.....	37
Figure 5: Stream Walk/Outfall Inspection-Inventory.....	38
Figure 6: Ratio of the Number of NOV's Issued to Number of IDDE Inspections.....	39
Figure 7: Percentage of Repeat Violations.....	39

Figure 8: Ratio of Number of NOV's Issued to Erosion Control Inspections Conducted.....	43
Figure 9: Ratio of Number of Deficiencies Detected to BMP Inspections Conducted .....	49
Figure 10: Ratio of Number of Deficiencies Detected to Municipal Inspections Conducted .....	57

## **Tables:**

Table 1: BMP Summary Table for Stormwater Management Program Administration.....	3
Table 2: Modifications to the Storm Water Plan Document for FY2023 .....	4
Table 3: BMP Summary Table for the Public Education and Outreach Program .....	6
Table 4: Presentations Conducted in FY2022 .....	12
Table 5: Events Attended in FY2022.....	13
Table 6: Status of Improvements Identified for Implementation in FY2022 .....	15
Table 7: Improvements Identified for Implementation in FY2023 .....	16
Table 8: BMP Summary Table for the Public Involvement and Participation Program .....	17
Table 9: Status of Improvements Identified for Implementation in FY2022 .....	23
Table 10: Improvements Identified for Implementation in FY2023 .....	24
Table 11: BMP Summary Table for the IDDE Program .....	25
Table 12: Action/Watch Level Exceedances Identified by Fixed Interval Monitoring.....	35
Table 13: Status of Improvements Identified for Implementation in FY2022 .....	40
Table 14: Improvements Identified for Implementation in FY2023 .....	41
Table 15: BMP Summary Table for the Construction Site Storm Water Control Program .....	42
Table 16: Status of Improvements Identified for Implementation in FY2022 .....	44
Table 17: Improvements Identified for Implementation in FY2023 .....	44
Table 18: BMP Summary Table for the Post-Construction Site Runoff Control Program .....	46
Table 19: BMP Numbers by Type and Jurisdiction.....	47
Table 20: Summary of BMP Inspections.....	47
Table 21: Summary of BMP Education.....	48
Table 22: BMP Inspections Revealing Problems from 2007 through 2022 .....	48
Table 23: Status of Improvements Identified for Implementation in FY2022 .....	49
Table 24: Improvements Identified for Implementation in FY2023 .....	50
Table 25: BMP Summary Table for the Pollution Prevention/Good Housekeeping Program .....	52
Table 26: Employee Training by Jurisdiction in FY2022 .....	55
Table 27: Summary of Inspection Findings from FY2008 through FY2022 .....	56
Table 28: Improvements Identified for Implementation in FY2023 .....	58
Table 29: BMP Summary Table for the TMDL Program.....	59
Table 30: Status of Improvements Identified for Implementation in FY2022 .....	59
Table 31: Improvements Identified for Implementation in FY2023 .....	60
Table 32: Measures of Success in FY2022.....	62
Table 33: Improvements Identified for Implementation in FY2023 .....	63

## **Attachments**

Attachment 1: Annual Assessment Report for TMDL Program Implementation .....	66
--	----

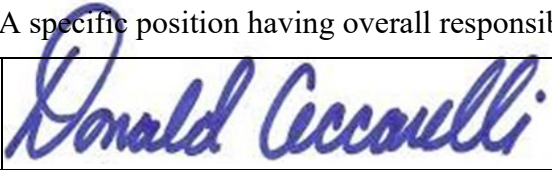
## Certification

By my signature below I hereby certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

I am also aware that the contents of this document shall become an enforceable Section of the NPDES MS4 Permit, and that both the Division and the Environmental Protection Agency have NPDES MS4 Permit compliance and enforcement authority.

- ☐ I am a ranking elected official.
- ☐ I am a principal executive officer for the permitted MS4.
- ☒ I am a duly authorized representative for the permitted MS4 and have attached the authorization made in writing by a principal executive officer or ranking elected official which specifies me as (*check one*):
- ☒ A specific individual having overall responsibility for stormwater matters.
- ☐ A specific position having overall responsibility for stormwater matters.

Signature:	
Print Name:	Don Ceccarelli
Title:	Division Director, Storm Water Services
Signed this <u>6<sup>th</sup></u> day of <u>December</u> 2022.	

## Section 1: Introduction

This document satisfies the annual assessment and reporting requirement of Storm Water Permit No. NCS000395 as follows:

- Evaluate program compliance, the appropriateness of best management practices (BMPs), and progress towards achieving measurable goals; and
- Evaluate the performance and effectiveness of the Storm Water Quality Management Program Plan, herein referred to as the Storm Water Plan.

The purpose of the Storm Water Plan is to describe the actions undertaken by the Permittee to ensure compliance with Permit requirements, including all BMPs and their associated measurable goals. Implementation of the BMPs consistent with the provisions of the Storm Water Plan constitutes compliance with the standard of reducing pollutants to the maximum extent practicable as required by the Permit. Charlotte-Mecklenburg Storm Water Services (CMSWS) has developed and is maintaining the Storm Water Plan for Permit No. NCS000395 on behalf of all co-permittees, including Mecklenburg County, Charlotte-Mecklenburg Schools (CMS), Central Piedmont Community College (CPCC), and the Towns of Cornelius, Davidson, Huntersville, Matthews, Mint Hill, and Pineville. This Storm Water Plan is available on the following website: <http://storm.water.charmeck.org> (select “Surface Water Quality,” select “Program Overview,” select “Current Storm Water Management Plan” under Phase II Permit at the bottom of the page).

Section 2 of this annual report provides background information regarding the implementation of the Storm Water Plan, including a fiscal analysis. Sections 3 through 9 provide the following:

- Detailed description of the status of the implementation of the Storm Water Plan, including information on the development and implementation of each major component of the plan between July 1, 2021 and June 30, 2022 (FY2022). Activities and associated schedules for implementation of the Storm Water Plan during FY2022 are contained in the Permittee’s FY2022 Work Plan, which is available upon request.
- Description of any proposed changes to the Storm Water Plan, including a justification for these changes and how the changes will impact the effectiveness of the Storm Water Plan.
- Summary of data accumulated through the implementation of the Storm Water Plan, including an evaluation of this data.
- Assessment of compliance with the Permit requirements, including a description of the specific BMPs implemented and whether the measurable goals for these BMPs have been satisfied. Additional detail regarding these BMPs and measurable goals is provided in Sections 3 through 9 of the Storm Water Plan provided at the above website.

Section 10 of this document provides an evaluation of overall program compliance and the effectiveness of the Storm Water Plan as well as the individual BMPs contained in the Plan. Section 11 describes the program modifications to be implemented to accomplish the intent of the Storm Water Plan and enhance overall Program effectiveness. Section 12 describes the modifications to the Storm Water Plan for FY2023 as a result of the FY 2022 evaluation of the effectiveness of the Plan.

## **Section 2: Overview and Funding**

CMSWS is responsible for developing, implementing, managing and overseeing the Storm Water Plan under the direction of Mecklenburg County's Water Quality Program Manager. The specific tasks, deadlines and assigned staff for fulfillment of the Storm Water Plan are described in an annual Work Plan. A copy of this Work Plan is available upon request to Mecklenburg County's Water Quality Program Manager. As specified in the Permit, each co-permittee is responsible for compliance with the terms and conditions of the Permit for storm water activities and watershed specific requirements within their jurisdictional area. Appropriate legal authority has been established by each jurisdiction for implementation of the Storm Water Plan through the adoption of Surface Water Pollution Control Ordinances that prohibit illicit discharges to the MS4 as well as the adoption of post-construction and erosion control ordinances. Mecklenburg County is delegated authority by each jurisdiction to enforce these ordinances. Funding for implementation of the Storm Water Plan is shared by each jurisdiction based on an adopted Funding Strategy. Implementation costs for the reporting period of July 1, 2021 through June 30, 2022 (FY2022) were \$792,229.84 including \$708,982.13 in labor costs and \$83,247.71 in operating costs, including laboratory, equipment, and supplies. For FY2023, costs are estimated at \$756,410.38, including \$652,014.24 in staff costs and \$104,396.14 in operating costs. The Phase II jurisdictions in Mecklenburg County utilize the revenue they receive from their storm water fee to fund the implementation of the Program with the exception of CMS and CPPC, which do not receive revenue from the storm water fee and therefore fund Phase II Program implementation through their general budget.

### Section 3: Stormwater Management Program Administration

A program has been developed and is currently being implemented for administering the Phase II Permit for Mecklenburg County's Phase II jurisdictions/entities for the purpose of ensuring that all Permit requirements are effectively and efficiently fulfilled by co-permittees in accordance with the SWMP and that the administration requirements specified in the Permit are being met. The program is administered by CMSWS's Water Quality Program as described in the following Sections. The goal of Program Administration is to implement, manage and oversee the provisions of the SWMP to control to the maximum extent practical the discharge of pollutants from the municipal storm sewer system associated with stormwater runoff and illicit discharges, including spills and illegal dumping and to ensure that all Phase II Permit requirements are effectively and efficiently fulfilled.

#### 3.1 Implementation Status for FY2022

Table 1 describes the BMPs identified in the Storm Water Plan for the Stormwater Management Program Administration and the specific actions completed between July 1, 2021 and June 30, 2022 (FY2022) for implementation of these BMPs as well as whether the measurable goals for the BMPs specified in the plan have been fulfilled.

Table 1: BMP Summary Table for Stormwater Management Program Administration

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
#1	Coordinate with co-permittees for Permit compliance and complete audits and program assessments as well as submit Permit applications, reports, etc. as required (PD-1 (Permit Development))	During FY2022, quarterly reports were provided to all co-permittees (referred to as Statements) summarizing activities performed for Permit compliance, hours involved, and costs. The NCDEQ audit was completed in FY2021. The Phase II Permit was renewed effective February 20, 2022. No State audits were performed in FY2022. The information contained in this Annual Assessment Report serves as a self-audit to NCDEQ for FY2022, including the status of completion of all BMPs and measurable goals as well as recommendations for improvement that are summarized in Table 31. These improvements will be implemented through the FY2023 Work Plan. This report will be provided to NCDEQ. In addition, the online annual BIMS report was completed and submitted to NCDEQ on August 19, 2022.	X	
#2	Evaluate the effectiveness of the Storm Water Plan and update as necessary, including all written policies and procedures. (PD-3 (Evaluate Management)) Plan)	Part II, Section A of Mecklenburg County's Phase II Permit (Permit # NCS000395) specifies that the Storm Water Quality Management Program Plan, referred to as the Storm Water Plan, must be kept up to date by the permittee. It further specifies that the permittee must evaluate the effectiveness of the Storm Water Plan at least annually and modify as necessary to address any procedural, protocol or programmatic changes. The modified Storm Water Plan must be submitted to the Director of NCDEQ within 90 days for approval. In November 2023, CMSWS completed its annual review of the Storm Water Plan developed for compliance with Permit # NCS000395. As a result of this review, the modifications described in Table 2 were implemented effective November 31, 2022. All written policies and procedures were also reviewed and updated as necessary.	X	



Table 2: Modifications to the Storm Water Plan Document for FY2023

Section & Page # from October 2021 Version	Description of the Modification
Section 2, page 2	Change authorized representative from Dave Canaan to Don Ceccarelli.
Section 2, page 2	Added a table identifying the dates when annual reviews of the SWMP were completed and responsible staff.
Section 3, page 3	Replaced Figure 1 with a map that more clearly delineates the different Phase II jurisdictions.
Section 3.3, page 3	Added definitions at the bottom of Table 2.
Section 3.4, page 10	Added definitions at the bottom of Table 3.
Section 3.5, page 9	Updated Table 3 with most current TMDL information.
Section 3.5, page 13	Replaced Figure 3 with an image that defined DO, TP, and TN.
Section 3.7, page 15	Replaced Table 6 with updated list of facilities with NPDES Industrial Permits.
Section 4, pages 18, 19, and 20	Updated the BMP summary table for Program Administration so that it would be consistent with the text in the annual Work Plan in Time Pro.
Section 4.4, pages 22 and 23	Changed to differentiate between SOPs and SAPs for the SWMP that include an approval page and revision history and SOPs for inclusion in SWPPP that do not include these.
Section 4.6, page 25, and Table 12	Updated annual assessment process and changed Table 12 to include SWMP changes made in FY2022.
Section 5.4.1, page 36	Replaced Figure 4 with a utility bill insert from October 2022.
Section 5.4.3, page 38	Rewrote this section around articles and newsletters instead of print ads
Section 5.4.5, page 39	Replaced Figure 5 with a web Banner for 2022.
Section 5.6 on pages 42 and 43	Change the measure of success for increasing awareness for the Public Education Program from 50% to 60% and removed the measure for increasing extent of exposure.
Section 5.4.8, page 30	Changed the pollution prevention video locations from the website to YouTube.
Section 5.5, page 41	Added the Underserved Communities Reach Plan developed in FY2023 to the information regarding efforts to reach our diverse community.
Section 6.2, pages 45 and 45	Updated the BMP summary table for Public Involvement and Participation so that it would be consistent with the text in the annual Work Plan in Time Pro.
Section 6.4.6, page 50	Updated the volunteer monitoring information to include the Streamside Snapshot as a third volunteer option available to participants.
Section 6.6, page 51	Changed the measure of success for increasing the number of volunteers for the Public Involvement Program to an increase from the average for the past 3 years.
Section 7.2, page 52, Table 18, numbers 21, 24, 25 and 26	Added # trained as an annual reporting metric for “c” under #21 and “a” under #24, 25 and 26.
Section 7.7.1, page 62	Added “total number and location of Notice of Violations issued” as a means of identifying priority areas with a high likelihood of illicit discharges.
Section 7.7.1, page 62 and	Changed time for responding to Category 1 service requests from within 4 hours to as soon as possible upon receipt. Also changed Category 2 from a 4-hour to a 2-hour response.
Section 7.7.1.2, page 63	Changed samples for fixed interval monitoring collected on the second Tuesday and Thursday of each month to just the second Tuesday. Also, eliminated 1 monthly sampling during base flow to identify illicit discharges.
Section 7.7.1.2, page 65	Replaced Figure 10 with the newest SUSI map for the 4 <sup>th</sup> quarter of FY2022.
Section 7.7.5, page 73	Updated Figure 12 to include NOV's issued from 7-1-2020 to 6-30-2022.
Section 7.8, page 73	Updated the last paragraph in this Section to describe IDDE municipal staff training completed for Permit term ending February 16, 2022.
Section 7.10, page 74	Changed the measure of success for increasing pollution problems identified for the IDDE Program to an increase from the average for the past 3 years.



Section & Page # from October 2021 Version	Description of the Modification
	Also, changed the measure of success for repeat violators to a decrease from the average of the last 3 years.
Sections 8.4 and 8.5, page 78	Expanded references to include erosion control ordinances for the Towns.
Section 8.8, page 78	Removed reference to CMCSI being conducted twice a year.
Section 8.11, page 80	Changed the measure of success for Construction Site Runoff Control Program to documenting inspection activities instead of documenting activities for completion of Work Plan program activities.
Section 9.6, page 87	Added BMPs installed for compliance with Huntersville's LID Ordinance prior to June 30, 2007 are not subject to these requirements.
Section 9.11, page 90, #9	Changed the length of Maintenance Bond from not less than 2 years from the BMP approval date of the Storm Water Administrator to as-built approval date.
Section 9.11, page 92	Added #11 to include actions taken to ensure maintenance of low-density projects.
Section 9.13, page 93	Changed the measure of success for the Post-Construction Runoff Control Program to documenting inspection activities instead of documenting activities for completion of Work Plan program activities.
Section 10.3, page 98	Changed the number of properties owned by co-permittees in CMSW's inventory from 3,052 to 3,208.
Section 10.3, page 99, Table 24	Changed job titles from Sr. Environmental Specialist to Solid Waste Facility Manager.
Section 10.3, page 100, Table 27	In the footnote to the table, changed the date for discontinuing operations at the Old Compost Central & Recycling Center from late 2021 to the spring of 2023.
Section 10.4, page 103	Change the effective date for when CMS owns 176 schools from January 1, 2021 to January 1, 2022.
Section 10.8, page 105	In the second bullet, changes 8.6 to 10.7.
Section 10.9, page 105	Updated for FY2022 numbers.
Section 10.16, page 111	Changed the measure of success for Pollution Prevention and Good Housekeeping to a decrease from the average for the past 3 years.
Section 10.16, page 111	Changed the measure of success for improving compliance for the Pollution Prevention and Good Housekeeping Program to a decrease from the average for the past 3 years.
Section 11.91, page 134	Updated Table 36 with new data.
Section 11.10, page 137 and 141	Added the BMP measures implemented in the TMDL watersheds during FY2022.
Appendix A, page 144	Updated the BMP Summary Table
Appendix B	Updated the organizational chart for CMSWS.
Appendix E, pages 187 through 190	Replaced old municipal facility inspection form with the new one.

## Section 4: Public Education and Outreach Program

CMSWS has developed and implemented a Public Education and Outreach Program for Mecklenburg County's Phase II jurisdictions/entities. The goals of the Public Education and Outreach Program are as follows:

1. Change public behaviors to reduce sources of water pollution and improve water quality.
2. Promote participation in activities aimed at restoring water quality conditions.

### 4.1 Implementation Status for FY2022

Table 3 describes the BMPs identified in the Storm Water Plan for the Public Education and Outreach Program and the specific actions completed between July 1, 2021 and June 30, 2022 (FY2022) for implementation of these BMPs as well as whether the measurable goals for the BMPs specified in the plan have been fulfilled.

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

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
3, 4, 5, 7, 8	Education & Outreach (Planning & Coordination, Educational Materials, Newsletters, Website, Schools, & Commercial) (PE-10)	<p>During FY2022, CMSWS' pollution prevention education included the distribution of educational materials by staff when conducting inspections and responding to citizen requests for service. All Phase II town halls were supplied with residential pollution prevention brochures. All town libraries were also supplied material, except for Pineville. The following handouts/brochures/pamphlets are available to staff for distribution:</p> <ul style="list-style-type: none"> <li>• A Guide to Used Oil Recycling</li> <li>• Scoop the Poop (proper handling of pet waste)</li> <li>• What Goes In Here Ends Up Here – postcard regarding neighborhood trash pollution</li> <li>• A Resident's Guide to Pollution Prevention</li> <li>• Volunteer Opportunities (English and Spanish)</li> <li>• A Brief Look at Charlotte-Mecklenburg Storm Water Services – Your Storm Water Fees at Work</li> <li>• Grease Free (proper disposal of grease from Charlotte-Mecklenburg Utilities)</li> <li>• Household Hazardous Waste – What do you do with left over chemicals</li> <li>• Environmental Notices for Homeowners– Disposal into the storm drain is against the law (English, Spanish, Chinese, Vietnamese, and Korean)</li> <li>• Environmental Notices for Businesses– Disposal into the storm drain is against the law (English, Spanish, Chinese, Vietnamese, and Korean)</li> <li>• Water Watchers door hanger</li> <li>• Household Hazardous Waste slider</li> <li>• Dispose of Leaves Properly postcard</li> <li>• Water Quality Buffers postcard</li> <li>• When Surface Waters Turn Colors (Pollen, Tannin, Iron Bacteria)</li> <li>• Automotive Facilities Pollution Prevention Poster (English and Spanish)</li> <li>• Clean Boating BMP</li> <li>• Fish Consumption Advisory</li> <li>• Invasive, Exotic Plants</li> <li>• NC Division of Natural Resources Fact Sheets: <ul style="list-style-type: none"> <li>○ Iron Bacteria</li> <li>○ Surface Film</li> </ul> </li> </ul>	X	

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		<ul style="list-style-type: none"> <li>○ Water Foam</li> <li>• Non-Structural Best Management Practices Handout <ul style="list-style-type: none"> <li>○ Mobile Detailer</li> <li>○ Landscapers</li> <li>○ Painters</li> <li>○ Contractors</li> <li>○ Carpet Cleaners (English and Spanish)</li> <li>○ Vehicle Service</li> <li>○ Food Service (Chinese, English, and Spanish)</li> <li>○ Multi-Family Complexes</li> <li>○ Stone Cutting &amp; Fabrication Industry</li> <li>○ Concrete Industry (English and Spanish)</li> <li>○ Commercial Property Management</li> <li>○ Asphalt Sealing (English and Spanish)</li> <li>○ Pool &amp; Spa Maintenance (English and Spanish)</li> <li>○ Horizontal Directional Drilling</li> <li>○ Breweries</li> <li>○ Equipment Repair</li> <li>○ Pressure Washers (English and Spanish)</li> <li>○ Rooftop Workers</li> <li>○ Realtors</li> <li>○ Well Drillers (English and Spanish)</li> <li>○ Utility Contractors (English and Spanish)</li> </ul> </li> <li>• Structural Best Management Practices Handout <ul style="list-style-type: none"> <li>○ Dry Detention</li> <li>○ Rain Garden</li> <li>○ Sand Filter</li> <li>○ Stormwater Wetland</li> <li>○ Wet Pond</li> </ul> </li> </ul> <p><u>Distribution of Educational Promotional Items</u>  The following promotional items are available for distribution at events.</p> <ul style="list-style-type: none"> <li>• Hand Sanitizer</li> <li>• Lip Balm</li> <li>• Ink Pens</li> <li>• Temporary Stormy Tattoos</li> <li>• Stormy Stickers</li> <li>• Magnets</li> <li>• “Scoop the Poop” bag dispenser w/flashlight</li> <li>• Stormy Plush</li> <li>• Color changing cups</li> <li>• Sunscreen</li> <li>• Flashlights</li> <li>• Keychains</li> <li>• Lunch boxes</li> <li>• Umbrellas</li> <li>• Water Bottles</li> <li>• Rain Gauges</li> <li>• Grocery bags</li> <li>• Whistles</li> <li>• Golf/boat towels</li> </ul>		

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		<ul style="list-style-type: none"> <li>• Koozies</li> </ul> <p>During FY2022, educational content was developed and disseminated to the Phase II co-permittees covering the targeted pollutants in the Storm Water Plan. Newsletters focused on the actions the public should take to reduce pollution, including participating in volunteer programs, and reporting suspected pollution problems. The @StormWaterCM social media accounts (Facebook, Twitter &amp; Instagram) were used as the main method to disseminate messages to Town residents. CMSWS staff emailed Town contacts at the beginning of each month with a calendar list of the relevant posts to share with their followers. Phase II social media contacts were then responsible for sharing messages on the Towns' or institutions' social media accounts. The Town of Pineville was also emailed messages to be included in the local town mailer. The topics for Pineville this year included proper control of sediment and fecal coliform bacteria sources as well as the promotion of volunteer activities. In order to address compliance with the Goose Creek TMDL, additional social media messages were created for the Town of Mint Hill that focused on promoting the sale of tree seedlings and rain barrels by the Mecklenburg County Soil and Water Conservation District and how to properly dispose of cooking oil and grease. Additional water quality education topics were included with monthly emails to volunteers if space was available. In FY2022, an Underserved Communities Reach Plan (UCRP) was developed that involved reviewing all public education and public involvement programs offered and providing recommendations to enhance the reach to diverse and underserved communities. Emails were sent to over 700 Phase II teachers in September, October, November, January, and February. These emails included information about the CMSWS educational programs. Programs offered include activities on pollution prevention, the history of water usage and pollution of drinking water sources in Mecklenburg County, a demonstration of the EnviroScape model, A Day in the Life of Water Quality Staff, and a macroinvertebrate identification lesson. All programs were offered virtually and in-person. As a result, 9 school presentations were given in the Phase II jurisdiction to 250 students as follows:</p> <ul style="list-style-type: none"> <li>• 1/11/22, Lake Norman Charter School – 8<sup>th</sup> Grade, EnviroScape and Career Video, 200 students</li> <li>• 3/2/22, Blythe Elementary – 2<sup>nd</sup> Grade, EnviroScape, 50 students</li> </ul> <p>Also, in FY2022 a new children's video was created "Lessons with Stormy" featuring an animated Stormy the Turtle which provides basic lessons of pollution prevention and the street to stream concept. This video will be used to reach elementary age students county-wide. In addition to school presentations, CMSWS conducted 43 public presentations, both virtually and in-person (see Table 4) and attended 13 events (see Table 5). During FY2022, the "Scoop the Poop" campaign included Social Media Posts and videos, vehicle magnets, presence at multiple dog events around the County including Pawsitively Matthews, Pet Palooza, and Subaru for the Love of Pets event. During FY2022, informational pages covering a wide variety of topics were maintained on the Storm Water Services website, including current water quality conditions, storm water pollutants and ways to minimize them, reporting pollution, volunteering, municipal storm water projects/activities, etc. These web pages also provide a means to register for various volunteer initiatives. The targeted pollutants on the pollution prevention pages include bacteria, pet waste, turbidity, sediment,</p>		

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		<p>phosphorus, nitrogen, organics, fertilizers, pesticides, yard waste, surfactants, hydrocarbons, pH, and toxic compounds. The targeted audiences include residential, commercial and institutional. The general messages promoted on the webpages are street to stream, only rain should go down the storm drain, and be a Good Neighbor/Volunteer. The webpages also provide contacts for reporting pollution problems/concerns and submitting questions to staff. During FY2022, Google Analytics showed CMSWS's webpages had 426,455 page views and 178,115 unique page views, which is an increase from the 417,437 page views in FY2021. The pages most often visited other than the homepage were the Streams and Lakes page, and the Storm Water Design Manual. For Industrial and Commercial Education, a new Concrete Industry BMP sheet was created. CMSWS staff updated the handouts, developed a list of current businesses in the county, and drafted a cover letter. The handouts and letters were completed in English and Spanish. The final mailing list identified 168 concrete contractors. CMSWS also collaborated with Charlotte Water and created a Utility Contractor BMP sheet for horizontal drilling in the Critical Watershed areas. The BMP sheet will be mailed in FY2023. Utility bill inserts were sent to over 200,000 Charlotte Water customers in July, August, September, January, February, April, and May related to water quality and pollution prevention. A Safe Swimming education and outreach campaign was developed to reach residents who use lakes in Mecklenburg County for swimming and recreation. Due to increased threats to water quality in these recreational waters, a campaign was developed with the following 4 purposes:</p> <ul style="list-style-type: none"> <li>Promote the Char-Meck Alert System which will be a major component of the notification process for No Swimming Advisories. (Additional notifications procedures are outlined in the Water Quality Program Communication Plan)</li> <li>Promote the 311 hot line for residents to report potential problems they see in the lakes.</li> <li>Promote the idea that it is best to wait 72 hours after rain events before swimming, especially in coves or near outfalls to reduce the chance of swimming in waters that may be high in bacteria due to stormwater impacts.</li> <li>Provide education/outreach for citizens regarding cyanobacteria blooms.</li> </ul> <p>A marketing and media plan was developed to promote the Char-Meck Alert notification system and the other items listed above. The plan was developed to focus on the 4 messages outlined above. It included paid digital advertising on various media outlets including social media, community newsletters, and airplane banners. In addition to a media plan, a Utility Bill Insert (UBI) was developed and distributed in the spring of 2022, a direct mailing was conducted to all waterfront property owners, and various give away items such as boat key rings, can koozies, and boat towel were created with educational messaging and distributed at boat ramps and other outlets. Social media posts were routinely conducted during spring and summer, and short educational videos were created and posted.</p>		
6 & 16	Public Education Media Campaign PE-10(d)	<p>In FY2022, CMSWS identified and implemented educational campaigns to target the following four (4) key objectives:</p> <ul style="list-style-type: none"> <li><u>Water Quality</u> – Increase public awareness of surface water quality issues and how to report pollution problems (target pollutants: fecal coliform and sediment)</li> </ul>	X	

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		<ul style="list-style-type: none"> <li><u>Volunteer</u> – Increase public action/volunteer engagement to reduce surface water pollution</li> <li><u>Flood Safety</u> – Increase public awareness of flood risks and flood safety</li> <li><u>Infrastructure</u> – Increase public awareness of storm drainage infrastructure that carries rainwater to streams and the importance of improving infrastructure to support a thriving city.</li> </ul> <p>These objectives supported content produced for media outlets, social media, and the webpage with a target audience of adults ages 25-54. Media outlets included Social Media, PPC &amp; Display &amp; Data Fusion, YouTube, Charlotte Five, Charlotte Agenda, Broadcast Television, Radio and the Webpage.</p> <p><u>Social Media</u> – CMSWS staff maintain a Facebook, Instagram, and Twitter Page (@StormWaterCM). The page is maintained using Sprout Social. In FY2022, we saw 3,010,357 impressions; 992,044 reaches; 481,717 engagements, and 72,053 clicks on social media.</p> <ul style="list-style-type: none"> <li>Facebook: 53 video posts; 199 photo posts; 34 link posts; 1 text posts</li> <li>Instagram: 4 carousel posts; 69 video posts; 310 photo posts</li> <li>Twitter: 46 video posts; 158 photo posts; 30 link posts; 17 text posts</li> </ul> <p><u>PPC &amp; Display &amp; Data Fusion</u> – 2,637,703 impressions; 3,198 clicks</p> <p><u>YouTube</u> – 2,125,390 impressions; 1,789 clicks</p> <p><u>Charlotte Five</u> – 16,800 impressions; 4 articles</p> <p><u>Charlotte Agenda</u> – 7,550 impressions; 7 calendar posts</p> <p><u>Broadcast Television</u> – 1,202,944 impressions; 493,200 reaches; 24% reach; 1.6 frequency; 150 ads</p> <p><u>Radio</u> – 1,413,600 impressions; 324,200 reaches; 75.4% reach; 4.6 frequency; 352 ads</p> <p><u>Webpage</u> – CMSWS' webpage, StormWater.CharMeck.org contains information about stormwater projects, stormwater pollution reporting, flooding, surface water quality, volunteer opportunities, fees, and regulations. Edits to the webpage are made throughout the year, with staff performing webpage reviews at least twice per FY. During FY2022, Google Analytics showed CMSWS's webpages had 426,455 page views and 178,115 unique page views, which is an increase from the 417,437 page views in FY2021.</p>		
9	Evaluate Effectiveness of Public Education and Outreach Program (PE-9)	<p>During FY2022, an evaluation was completed of the Public Education and Outreach Program revealing that the program components and BMPs specified in the Storm Water Plan are performing effectively and efficiently at achieving program goals and that they meet or exceed permit requirements. Provided below is a report of the status of the program's attainment of the specific measures of success contained in the Storm Water Plan.</p> <ul style="list-style-type: none"> <li><u>Documentation of Storm Water Program Activities</u> – Public education SOPs have been reviewed and updated annually. All the measurable goals assigned to the BMPs have been satisfactorily fulfilled and properly documented in CMSWS's Cityworks and/or the Volunteer Database.</li> <li><u>Increasing Awareness</u> – Storm Water Public Opinion Surveys are conducted annually to measure the effectiveness of the Public Education and Outreach Program at improving awareness of water quality issues as well as to assess citizen's level of concern/interest. The FY2022 survey was completed in April and May 2022. The measure of success for the Public Education and Outreach Program is a</li> </ul>	X	



BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		<p>minimum of 60% of survey respondents indicating they are aware that water flowing into storm drains goes directly to creeks and lakes. For FY2022, 81.5% of survey respondents indicated awareness, which is an increase of 7.6% from FY2021 which was 75.7%. This increase tested to be significant at a 95% confidence level.</p> <p>Other metrics used to measure program success are the number of events attended and public presentations given. In FY2022, 43 presentations (see Table 4) were given which is a slight increase from FY21, which had 38. Some presentations were in person, while some were virtual. In FY2022, 15 events were attended reaching approximately 1,773 people. Due to the pandemic, no events were attended in FY2021. The program continued to further develop educational handouts and brochures and has numerous flyers for various issues in multiple languages. In FY2022 there was a focus to increase bilingual material. All educational BMP sheets created are also translated to Spanish. Some Utility Bill Inserts with educational messaging were also translated into Spanish. An Underserved Community Reach Plan was developed to identify areas for improvement regarding our Public Education program and recommendations from this plan will be incorporated into future workplans and initiatives. In order to educate the public regarding pollution from pet waste, a “Scoop the Poop” campaign included Social Media Posts and videos, vehicle magnets, presence at multiple dog events around the County including Pawsitively Matthews, Pet Palooza, and Subaru for the Love of Pets event. The program focused on the Concrete Industry for the commercial education program. New BMP handouts were created in English and Spanish and were mailed to 168 concrete contractors. The message was aimed at educating the industry regarding best practices for concrete trucks to prevent stormwater pollution. CMSWS also collaborated with Charlotte Water and created a Utility Contractor BMP sheet for horizontal drilling in the Critical Watershed areas. The purpose of this sheet is to provide best practices to utility drilling contractors to avoid hitting sewer lines and impacting recreational waters. Utility bill inserts were sent to over 200,000 Charlotte Water customers in July, October, January, and April related to water quality and pollution prevention. A Safe Swimming education and outreach campaign was developed to reach residents who use lakes in Mecklenburg County for swimming and recreation. More information about this educational campaign can be found under PE-10. The evaluation of the FY2022 public education program has determined that outreach efforts on the targeted pollutants, sources, audiences, and issues described in the Storm Water Plan has enabled program goals to be achieved effectively and efficiently. In addition, the fifth year of the Scoop the Poop Campaign, first conducted in FY2018, was again effective at educating citizens to protect water quality and will be continued in FY2023. Stormy the Mascot also continues to be a great asset to Public Education and is very effective at promoting our messaging. In FY2023 the media campaign will continue to focus on the digital platforms to reach specific demographics within the targeted audience more effectively. Digital Marketing has proven to be effective at reaching targeted audiences by using data fusion and PPC campaigns on popular platforms such as Charlotte Agenda and Charlotte Five. The program will also continue to provide targeted education in situations where specific messages are needed. A large variety of education handouts are available for different educational needs. As part of the overall program evaluation, recommendations for improvement have been made as described in Section 3.3 below. These recommendations will be</p>		



BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		implemented in FY2023 through the execution of the annual Work Plan.		

Table 4: Presentations Conducted in FY2022

Date	Group Name/Audience	# of Participants	Presentation Title/Topic
7/15/2021	Charlotte-Mecklenburg Storm Water Services Advisory Committee	16	FY2021 Capital Improvement Program Annual Report
7/19/2021	Belmont City Council	40	Enhanced Erosion Control Practices
8/18/2021	Cambridge Grove Community	30	Waters of Huntersville
8/19/2021	Charlotte-Mecklenburg Storm Water Services Advisory Committee	25	FY2021 SWAC Annual Report; Charlotte Strategic Plan
8/23/2021	Huntersville Rotary Club	30	Waters of Huntersville
9/16/2021	Charlotte-Mecklenburg Storm Water Services Advisory Committee	22	Program for Public Information Annual Update
9/16/2021	League of Women Voters Environmental Team	8	Regional Storm Water Issues and Actions
9/16/2021	Covenant Presbyterian Church	22	Adopt-A-Stream, Volunteer Opportunities, Water Quality
10/12/2021	Charlotte Wildlife Stewards	40	Stream Restoration: Improving Habitat and Benefits to Aquatic Life
10/21/2021	Charlotte-Mecklenburg Storm Water Services Advisory Committee	26	City Unified Development Ordinance; City's Surface Water Quality and Environmental Permitting Program Briefing
11/2/2021	Henrico County Virginia Government Staff	8	Floodplain Buyout Program
11/4/2021	Davidson College	40	Waters of Davidson
11/5/2021	Palisades Master HOA	2	Palisades Development
11/5/2021	Palisades Regency HOA	6	Palisades Development
11/9/2021	Mecklenburg County Environmental Stewardship Committee	20	Mecklenburg County Buffer Requirements
11/18/2021	Charlotte-Mecklenburg Storm Water Services Advisory Committee	16	City Capital Programs and Unified Development Ordinance
11/18/2021	UNCC ASCE Student Chapter	30	Stream Restoration Project along Toby Creek
12/6/2021	Stevens Grove HOA	30	Compliance with PCO BUA Requirements
12/7/2021	Post Construction Workshop	150	The Importance of Post Construction Regulatory Controls for Reducing Stream and Flooding Impacts
12/7/2021	Regional Stormwater Partnership of the Carolinas	150	RSPC Post Construction Workshop
12/7/2021	Charlotte-Mecklenburg Surveyors Association	46	Buffer & Impervious Area restrictions
12/16/2021	Charlotte-Mecklenburg Storm Water Services Advisory Committee	11	FY2022 Budget Review
1/20/2022	Charlotte-Mecklenburg Storm Water Services Advisory Committee	29	FY2023 Budget Information and Update

Date	Group Name/Audience	# of Participants	Presentation Title/Topic
2/4/2022	National Pavement Expo	60	Stormwater Pollution Control Ordinance and "High PAH" Pavement Products
2/17/2022	Charlotte-Mecklenburg Storm Water Services Advisory Committee	22	FY2023 Budget Recommendations
2/21/2022	Environmental Educators of North Carolina	10	Spreading the Message without Spreading COVID
3/1/2022	Keep Charlotte Beautiful Board	20	CMSWS: Public Involvement Spring Update
3/1/2022	West Branch Rocky River Stakeholder Group	30	West Branch of Rocky River Stream Restoration Project
3/4/2022	Wildlife Habitat Stewards	30	Biological Monitoring and Macroinvertebrates
3/10/2022	Palisades Master HOA	4	Palisades Development
3/14/2022	ASCE/EWRI Stormwater O&M Conference	35	Charlotte's Experience in Development an MS4 O&M Manual
3/17/2022	Charlotte-Mecklenburg Storm Water Services Advisory Committee	16	Mecklenburg SWS FY2023 Budget Review
3/23/2022	Girl Scouts	15	Enviroscape
3/24/2022	North Carolina Water Resources Research Institute	30	Real-Time Prediction of Fecal Pollution in Charlotte-Mecklenburg Surface Waters Using Machine Learning Models
4/11/2022	Hidden Valley Community Association	15	Hidden Valley Ecological Garden Field Tour
4/15/2022	The Sanctuary Neighborhood Association	10	Stormwater Pollution Prevention
5/10/2022	Mecklenburg County Environmental Stewardship Committee	30	Overview of Mecklenburg County Stream Restoration
5/19/2022	Charlotte-Mecklenburg Storm Water Services Advisory Committee	8	Charlotte's Pollution Control Ordinance Enforcement Program and Orbit Energy Case History
5/24/2022	Catawba-Wataree Water Management Group	6	Toby and Mallard Creek Stream Restoration
5/25/2022	Regional Stormwater Partnership of the Carolinas	150	RSPC Stormwater System Inventory and Dry Weather Flow Evaluations
6/10/2022	Emergency Management, City and County Staff, Town Leaders	55	NWS Warning System and FINS Live Workshop
6/14/2022	Charlotte-Mecklenburg Storm Water Services Advisory Committee	24	<b>Post Construction Ordinance</b>
6/23/2022	Mecklenburg Ministries	42	High PAH sealant product ban
<b>Total</b>		<b>1,409</b>	

Table 5: Events Attended in FY2022

Date	Event Name	Estimated # of Citizens Contacted	Materials Displayed
8/3/2021	National Night Out	100	CMSWS volunteer brochure and SWAG (cups, flashlights, pens)
8/7/2021	Riverfest	270	CMSWS volunteer brochure, SWAG (cups, flashlights, pens, hand sanitizer), Prize Wheel
9/22/2021	Bark in the Park	5	Poop bag holders

Date	Event Name	Estimated # of Citizens Contacted	Materials Displayed
10/9/2021	Subaru for the Love of Pets Adoption and Rabies Clinic	20	SWAG (poop bag holders, reusable bags, coloring books, flashlights)
10/16/2021	Nature at Night	40	Fish game, lake handouts, volunteer brochure, SWAG (coloring books, flashlights, coloring pencils, reusable bags)
10/16/2021	Kids in Nature Day	120	Bugs, volunteer brochure, SWAG (coloring books, flashlights, coloring pencils, reusable bags)
10/21/2021	Charlotte Wildlife Stewards i-Spy Event	20	Stormy, Enviroscape, SWAG (coloring books, flashlights, cups)
11/6/2021	Pawsitively Matthews	105	SWAG (Poop bag holders, reusable bags, flashlights, and coloring books)
1/25/2022	Carolina Green Industry Network	70	Lawn Care BMP Trifold, Prize Wheel, SWAG (cups, pens, flashlights)
4/21/2022	Earth Day Celebration for Windsor Park Neighborhood	250	Bugs, Prize Wheel, SWAG (cups, poop bag holders, coloring books, reusable bags)
4/23/2022	Charlotte Earth Day Celebration	130	Trifold, Plinko, SWAG (Whistles, coloring books, colored pencils, chapstick, poop bag holders)
4/30/2022	Bark in the Park	100	Poop bag holders
4/30/2022	Earth Jam	100	Bugs, Prize Wheel, SWAG (Whistles, coloring books, cups, pens, flashlights)
5/14/2022	Catawba Riverfest	343	Stormwater handouts, Plinko, Trifold, SWAG (poop bag holders, hand sanitizer, chapstick, notebooks, pens)
5/14/2022	Pet Palooza	100	SWAG (Poop bag holders, cups, pens, flashlights, coloring books)
<b>Total</b>		<b>773</b>	

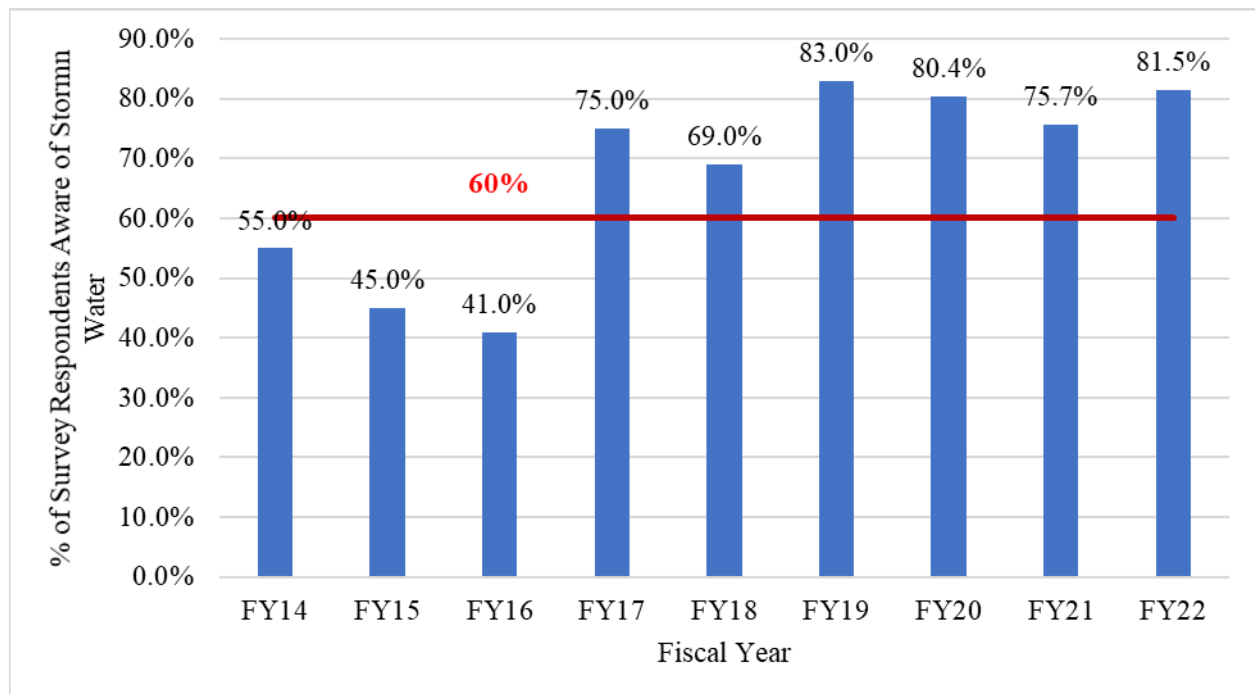


Figure 1: Percentage of Survey Respondents Aware that Stormwater Drains to Surface Waters (Success = Greater than 60%)

## 4.2 Status of Improvements Identified for Implementation in FY2022

Table 6 provides the status of improvements in the Public Education and Outreach Program that were identified in FY2021 for implementation in FY2022.

Table 6: Status of Improvements Identified for Implementation in FY2022

#	Improvements Identified for Implementation in FY19	Desired Result	Program Element	Responsible Staff	Implementation Status
1	Continue to develop a plan to evaluate and improve public education and public involvement to minority populations in Mecklenburg County.	Increase Awareness Among Minorities	PE-10(i)	Taylor Mebane	An Underserved Communities Reach Plan has been developed and will be implemented in FY2023.
2	Develop and implement a plan to promote the Char-Meck Alert System for notifying citizens of swimming advisories in Mecklenburg County.	Increase Awareness Among Lake Users	PE-10(k)	David Caldwell and Ashley Smith	An extensive educational outreach plan was created and implemented to promote the Char-Meck Alert system and No Swimming Advisories.
3	Develop and implement new public education wrap for one of our fleet trucks.	Increase Awareness Among General Population	PE-10(l)	Ashley Smith	In November 2021, a lake protection vehicle wrap that promotes the reporting of pollution problems on our lakes was developed and installed on one of our fleet pick-up trucks used to pull our boat.
4	Roll out public education video competition to schools.	Increase Awareness Among Students	PE-10(h)	Ken Friday	A storm water pollution prevention song competition was promoted in schools. A winner was chosen, and the song was promoted on social media.
5	Continue to develop a children's educational video for use in the schools	Increase Awareness Among Students	PE-10(g)	Ashley Smith	A children's animated cartoon, "Lessons with Stormy" was created using Stormy the mascot to promote pollution prevention. The video was debuted at a nearby elementary school, with a special appearance by Stormy.

## 4.3 Improvements Identified for Implementation in FY2023

Table 7 below describes the improvements in the Public Education and Outreach Program that have been identified for implementation in FY2023.

Table 7: Improvements Identified for Implementation in FY2023

#	Improvements Identified for Implementation in FY23	Desired Result	Program Element	Responsible Staff
1	Redesign the current water quality school education material for younger ages to be more engaging and relevant to the school curriculum.	Improve effectiveness of school age training materials.	PE-10	Ashley Smith
2	Modify school education worksheets to include Spanish.	Improve effectiveness of school age training materials.	PE-10	Ashley Smith
3	Implement the Safe Swim Communication Campaign to provide education to lake users regarding Best Management Practices related to swimming in lakes.	Better inform swimmers of health issues related to swimming in lakes.	PE-10	Ashley Smith
4	Implement the public education components of the Underserved Communities Reach Plan.	Increase volunteer activity.	PE-10	Ashley Smith
5	Develop video to educate residents on built-upon area (BUA) requirements for protection of water quality.	Improve compliance with BUA.	PE-10	Ashley Smith

## Section 5: Public Involvement and Participation Program

CMSWS has developed and implemented a Public Involvement and Participation Program for Mecklenburg County's Phase II jurisdictions/entities. The goal of the Public Involvement and Participation Program is to create opportunities for the public to participate in Phase II program development and implementation, as well as to get involved in activities aimed at protecting and restoring water quality conditions.

### 5.1 Implementation Status for FY2022

Table 8 describes the BMPs identified in the Storm Water Plan for the Public Involvement and Participation Program and the specific actions completed between July 1, 2021 and June 30, 2022 (FY2022) for implementation of these BMPs as well as whether the measurable goals for the BMPs specified in the plan have been fulfilled.

Table 8: BMP Summary Table for the Public Involvement and Participation Program

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
11	Conduct Phase II Public Meeting (PI-1)	On March 17, 2022, Dave Canaan provided a presentation to the Charlotte-Mecklenburg Storm Water Advisory Committee (SWAC) that included slides regarding efforts for compliance with Phase II Permit requirements in Mecklenburg County. The meeting was open to the public for comment. Approximately 25 persons were in attendance. No comments were received. No actions were taken.	X	
12	Implement Adopt-A-Stream Program (PI-2)	<p>During FY2022, 555 volunteers spent 1,074 volunteer hours removing 11,694 pounds of trash from 64.7 stream and shoreline miles in Mecklenburg County's Phase II jurisdictions. These stats broken down by Phase II jurisdiction are as follows:</p> <ul style="list-style-type: none"> <li>Cornelius: 0.52 miles adopted; 1 volunteer group; 25 volunteers; 38 volunteer hours; 108 pounds of trash removed</li> <li>Davidson: 6.9 miles adopted; 3 volunteer groups; 52 volunteers; 79 volunteer hours; 1,610 pounds of trash removed</li> <li>Huntersville: 7.5 miles adopted; 8 volunteer groups; 83 volunteers; 178 volunteer hours; 845 pounds of trash removed</li> <li>Matthews: 7.4 miles adopted; 8 volunteer groups; 140 volunteers; 355 volunteer hours; 3,705 pounds of trash removed</li> <li>Mecklenburg County: 37.7 miles adopted; 21 volunteer groups; 203 volunteers; 325 volunteer hours; 2,836 pounds of trash removed</li> <li>Pineville: 4.7 miles adopted; 5 volunteer groups; 52 volunteers; 101 volunteer hours; 2,590 pounds of trash removed</li> </ul> <p>All data and information regarding the Adopt-A-Stream Program activities were input into the County's Volunteer Database. During FY2022, the SOPs that support the program were reviewed and updated as necessary. There were 2 water quality problems reported by Adopt-A-Stream Volunteers and addressed by CMSWS Staff.</p>	X	
13	Implement Storm Drain Marking Program (PI-3)	<p>During FY2022, 61 volunteers spent 84 hours marking 350 storm drains in Mecklenburg County's Phase II jurisdictions. The breakdown by Phase II jurisdiction is as follows:</p> <ul style="list-style-type: none"> <li>Cornelius: 1 event, 4 volunteers, 4 hours, 56 markers, 0 problems reported</li> <li>Davidson: 1 group, 2 events, 2 volunteers, 3 hours, 13 markers, 0 problems reported</li> </ul>	X	

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		<ul style="list-style-type: none"> <li>Huntersville: 1 group, 3 events, 6 volunteers, 12 hours, 51 markers, 0 problems reported</li> <li>Matthews: 3 groups, 5 events, 36 volunteers, 39 hours, 80 markers, 0 problems reported</li> <li>Mint Hill: 1 planned event that was rained out</li> <li>Pineville: 1 event, 13 volunteers, 26 hours, 150 markers, 0 problems reported</li> </ul> <p>All data and information regarding the Storm Drain Marking Program activities were input into the County's Volunteer Database. During FY2022, the SOPs that support the program were reviewed and updated as necessary. No water quality problems were reported as a result of storm drain marking activities.</p>		
14	Conduct Annual Surface Water Clean Up (PE-I(4))	<p>The annual countywide surface water cleanup referred to as the "The Big Spring Clean" was completed on March 26, 2022 resulting in 313 volunteers spending 939 volunteer hours removing 10,920 pounds of trash from 12.04 stream and shoreline miles in Mecklenburg County. A summary of the event results is provided below, and a map of the cleanup locations is in Figure 2:</p> <ul style="list-style-type: none"> <li>Charlotte: 8.05 miles of stream/shoreline cleaned, 218 volunteers, 654 volunteer hours, 8,300 pounds of trash removed, 0 water quality problems reported</li> <li>Davidson: 3.81 miles of stream/shoreline cleaned, 50 volunteers, 150 volunteer hours, 1,570 pounds of trash removed, 0 water quality problems reported</li> <li>Matthews: 0.18 miles of stream/shoreline cleaned, 45 volunteers, 135 volunteer hours, 1,050 pounds of trash removed, 0 water quality problems reported</li> </ul> <p>All data and information regarding the Big Spring Clean activities were input into the County's Volunteer Database. During FY2022, the SOPs that support the program were reviewed and updated as necessary. No water quality problems were reported as a result of The Big Spring Clean activities.</p>	X	
15	Implement Volunteer Monitoring Program (VM)	<p>During FY2022, the Volunteer Monitoring (VM) program included Streamside Snapshot (SS) and Chemical Monitoring (CM). SS involves taking a photo of a creek at locations along greenways designated by signage that includes a QR code for sending in the photo along with a comment about creek conditions. Under SS there were 7 sites in the Phase II jurisdictions with 95 volunteers participating including:</p> <ul style="list-style-type: none"> <li>Four Mile Creek at E. John St. Matthews</li> <li>Torrence Creek at Bradford Hill Rd, Huntersville</li> <li>Torrence Creek at Stawell St., Huntersville</li> <li>Campbell Creek at Campbell Creek Greenway, Matthews</li> <li>McMullen Creek at McMullen Creek Greenway, Pineville</li> <li>South Prong Rocky River at Rocky River Greenway, Davidson</li> <li>Stevens Creek at Stevens Creek Nature Preserve, Mint Hill</li> </ul> <p>The breakdown of the number of volunteers and the water quality issues detected by jurisdiction for SS are as follows:</p> <ul style="list-style-type: none"> <li>Cornelius: 0 Site, 0 Volunteers, 0 Issue detected</li> <li>Davidson: 1 Site, 2 Volunteers, 0 Issue detected</li> <li>Huntersville: 2 Sites, 8 Volunteers, 5 Issue detected</li> <li>Matthews: 2 Sites, 21 Volunteers, 17 Issues detected</li> <li>Mint Hill: 1 Site, 15 Volunteers, 0 Issues detected</li> <li>Pineville: 1 Site, 8 Volunteers, 4 issues detected</li> </ul>	X	



BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		<p>Chemical Monitoring (CM) involves collecting and reporting water quality data using field test kits. Under CM there were 10 sites in the Phase II jurisdictions with 128 volunteers contributing 19 hours including:</p> <ul style="list-style-type: none"> <li>Cornelius: 0 Groups, 0 Volunteers, 0 Volunteers hours, 0 Monitoring event, 0 issues detected</li> <li>Davidson: 0 Groups, 0 Volunteers, 0 Volunteers hours, 0 Monitoring event, 0 issues detected</li> <li>Huntersville: 2 Groups, 13 Volunteers, 4.5 Volunteers hours, 0 Monitoring event, 1 issue detected</li> <li>Matthews: 2 Groups, 19 Volunteers, 6 Volunteers hours, 0 Monitoring event, 0 issues detected</li> <li>Mint Hill: 0 Groups, 0 Volunteers, 0 Volunteers hours, 0 Monitoring event, 0 issues detected</li> <li>Mecklenburg: 4 Groups, 52 Volunteers, 6.5 Volunteers hours, 10 issue detected</li> <li>Pineville: 2 Groups, 44 Volunteers, 2 Volunteers hours, 1 issue detected</li> </ul> <p>All data and information regarding the Volunteer Monitoring Program were input into the County's Volunteer Database. During FY2022, the SOPs that support the program were reviewed and updated as necessary. 38 water quality issues were reported as a result of the Volunteer Monitoring Program.</p>		
16	Public Involvement Media Campaign (PEI(13))	<p>For FY2022, CMSWS was under contract with Saturday Brand for creative design, and The Agency Marketing Group for media buying. CMSWS staff and staff from The Agency Marketing Group and Saturday Brands met monthly to discuss the budget and the media campaign direction. Water quality and volunteer strategic marketing/advertising strategies were created which outlines the creative and media plans for FY2022. The three focuses of the media campaign are, Reporting Pollution, Volunteering, and Flood Safety. Additionally, there is a City of Charlotte only campaign on Infrastructure. The media campaign was also used to promote the 311 helpline and the CLT+ app for reporting suspected pollution problems. The campaign included a media buy that utilized the following Mediums.</p> <p><b>TRADITIONAL MEDIA</b> – Broadcast Television, Radio, &amp; Print. Traditional media is measured using the following:</p> <ul style="list-style-type: none"> <li>Impressions – An impression is the number of individuals that have seen and/or heard the ad at least once.</li> <li>Reach – Indicated as a percentage of the total audience chosen. Ex: all persons 25 to 54 years of age, or all persons 18 year of age or older.</li> <li>Frequency – The average number of times an individual has seen or heard the ad during a specific time frame or campaign flight.</li> </ul> <p><b>Broadcast Television</b> – CMSWS used WSOC, located within the Charlotte designated media area (DMA), to promote Storm Water messaging. WCNC is viewed by 70% of the Adults in the Charlotte DMA each week. The DMA includes 13 counties surrounding Mecklenburg with Mecklenburg accounting for just over half of the viewership.</p> <p><b>Radio</b> – The buy included Beasley Radio (WPEG and WBAV) and La Rza &amp; Latina 102.1 to target African American and Hispanic listeners to promote water quality initiatives, and volunteer programs and educate about flood safety.</p> <p><b>Print</b> – The only print media used this year were the Utility Bill Inserts (UBI) that are included in the Charlotte Water bill. A schedule of the UBI and the message topics we agreed on by the team and planned around scheduled events, including Hurricane Season, The Big Spring Clean, Infrastructure Week, etc.</p> <p><b>DIGITAL MARKETING</b> – On-line Digital Display, Pay-Per-Click (PPC)</p>	X	

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		<p>Campaigns, Axios Charlotte Promotions, Charlotte Five Articles and Data Fusion. Digital Marketing is measured using the following:</p> <ul style="list-style-type: none"> <li>Targeted Impressions – An impression targeted to a specific audience characteristic, such as age, gender, interests, etc. Of the targeted individuals, this counts the number of individuals that have seen and/or heard the ad at least once.</li> <li>Interaction/Clicks – The number of people that have clicked on an ad or word phrase bringing them to your website or landing page.</li> </ul> <p><u>Digital Display</u> – Digital display advertising is graphic advertising on websites and apps through banners made of text and images. The main purpose of display advertising is to deliver general advertisements and brand messages to site visitors. Our online display ads are visible and clickable on a variety of websites within the targeted geography of Mecklenburg County. These sites are monitored to assure they are legitimate and appropriate for everyone.</p> <p><u>Pay-Per-Click (PPC)</u> - PPC is an online advertising model in which advertisers pay each time a user clicks on one of their paid search ads using Google.com. We strategically bid on short keywords and longer tail keyword phrases and when those terms are searched, our results show up at the top of the Google Search results. Our ads click through to a designated website or landing page.</p> <p><u>Charlotte Agenda</u> – Charlotte Agenda, now known as Axios Charlotte, is a very popular source for Charlotte news and things to do in and around Charlotte. We purchase a monthly calendar event on the site for Second Saturday Volunteer, VolunThursday, and Creek Week Events.</p> <p><u>Charlotte Five Articles</u> – CharlotteFive is a part of The Charlotte Observer that is similar to Axios Charlotte. CharlotteFive is a very popular website, daily email and social media platform. We partner with CharlotteFive to have specific articles written by the editors. The articles are 300 to 500 words with two or three pictures.</p> <p><u>Data Fusion</u> –Data Fusion Marketing uses an audience-based campaign across Connected Television, Display and Video targeted at the household level to promote messaging of Charlotte-Mecklenburg Storm Water Services. It uses OTT (Over the Top) television that is streamed digitally through services such as Hulu, Roku or any other streaming service. This digital approach is geo-targeted to Mecklenburg County and individual behaviors and actions rather than just a broad-based outreach approach.</p> <p><u>SOCIAL MEDIA</u> – Facebook, Instagram and Twitter. We also make use of Sprout Social to help with management and reporting. Social Media is measured using the following:</p> <ul style="list-style-type: none"> <li>Impressions – An impression is the number of individuals that have seen and/or heard the ad at least once.</li> <li>Reach – The number of people “Stopped” or paused on an ad or post in a social media feed.</li> <li>Engagements - An engagement is when a person, likes, comments or shares a social media ad or post.</li> <li>Clicks- The number of times a person clicks on our ads to be taken to a page of the website or landing page.</li> </ul> <p><u>Facebook</u> – We used Facebook advertising as we've seen great success on the platform in the past. Facebook events have helped us to build a community of active volunteers. Boosted posts also remain a great way to increase engagement for both our current fans and beyond. In addition, Facebook's retargeting and lookalike capabilities have been instrumental in keeping interested citizens engaged with us and also reaching new audiences. Facebook's lookalike audience targeting allows us to make a mirror audience of our current Facebook</p>		

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		<p>fans and target them with content. This platform also allows our partners to share content and we can do the same for them.</p> <p><u>Instagram</u> – Instagram is an affordable advertising option with great targeting capabilities. It's not only a great way to expand our reach to young people (high schoolers, college students, and recent grads), there is also a growing presence of older audiences. It has shown a growth rate of 3.7% which is more than Facebook and Twitter. As the platform continues to expand. Both "in feed" and "stories" ads are a great way to drive traffic to our website. This year we began making more use out of Instagram Stories and Reels, which are new tools to engage with our followers. Stories can contain, images, words, interactive quizzes, polls, and the ability to repost images from volunteers or our partners.</p> <p><u>Twitter</u> – Twitter is another great social media tool to get information out quickly and allows users to “retweet” or repost our information.</p> <p><u>Sprout Social</u> is an online social media platform used for the posting, responding to comments, and data tracking of multiple social channels. This was purchased in July 2019 to help with social media posting and management, which was a responsibility that was pulled from outside vendors and brought in house in FY20 due to policy changes.</p> <p><b><u>Full Storm Water Campaign Totals for FY2022 (includes Water Quality, Volunteer, Flood, and Infrastructure):</u></b></p> <p><u>FY21 Social Media Data</u>  Impressions = 3,010,357  Reach = 992,044  Engagements = 418,717  Post Link Clicks = 72,053</p> <p><u>PPC, Display &amp; Data Fusion</u>  Impressions = 3,448,030  Clicks = 3,198  Click Through Rate (CTR) = .18%</p> <p><u>Charlotte Five</u>  Impressions = 16,800</p> <p><u>Charlotte Agenda (Axios)</u>  Impressions = 7,550</p> <p><u>Broadcast Television</u>  Impressions = 356,000  Reach = 24%  Frequency = 1.6</p> <p><u>Radio</u>  Impressions = 1,501,000  Reach = 75%  Frequency = 4.6</p>		
17	Conduct Annual Volunteer Appreciation Event (PE-I(14))	<p>During FY2022, volunteers were recognized in monthly emails, social media posts, and by gifts such as stickers, magnets, t-shirts, and hoodies. Lapel Pins were also given to replace magnets. Of the twelve-monthly volunteer emails sent out during FY2022, 11 of them featured a “Volunteer Spotlight.” The January newsletter featured volunteer groups of the year. These groups were offered t-shirts and were given a social media post written about their accomplishments. A total of 68 t-shirts, 447 magnets, 500 stickers, and 725 lapel pins were given out to groups and individuals. All volunteers were offered the appreciation magnet, sticker, or lapel pin as it was included with their supplies or was displayed at the registration table at CMSWS-hosted events. These forms of recognition allow CMSWS to show appreciation to more groups and individuals throughout the year, as opposed to having an event that only a fraction of the volunteers would</p>	X	

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		be able to attend. During FY2022, all SOPs supporting volunteer appreciation were reviewed and updated as necessary.		
18	Evaluate Effectiveness of Public Involvement and Participation Program (PI-6)	<p>During FY2022, an evaluation was completed of the Public Involvement and Participation Program revealing that the program components and BMPs specified in the Storm Water Plan are performing effectively and efficiently at achieving program goals and that they meet or exceed permit requirements. Table 9 below provides the status of improvement actions for FY2022. Section 4.3 below outlines improvements identified for FY2023. Provided below is a report of the status of the program's attainment of the specific measures of success contained in the Storm Water Plan.</p> <ul style="list-style-type: none"> <li>• <u>Documentation of Storm Water Program Activities</u> – All the measurable goals assigned to the BMPs have been successfully fulfilled and properly documented in CMSWS's Cityworks and /or the Volunteer Database.</li> <li>• <u>Increasing Number of Volunteers</u> – The indicator of success is an increase in the number of volunteers compared to the average of the previous three (3) years. In FY2022, countywide the number of volunteers was 4,623 which represents an increase from the average of the last three (3) years prior to COVID at 4,391. FY2022 was a huge recovery year after being impacted by the COVID-19 pandemic the previous 2 years.</li> </ul>	X	

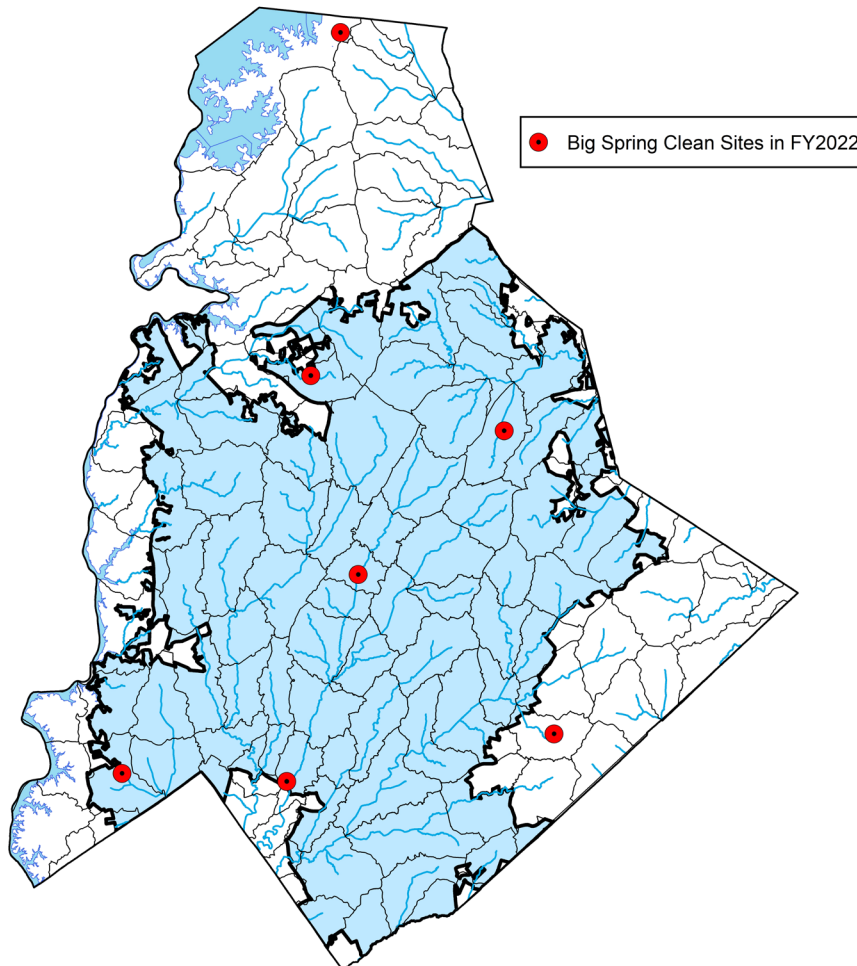


Figure 2: The Big Spring Clean Locations in FY2022

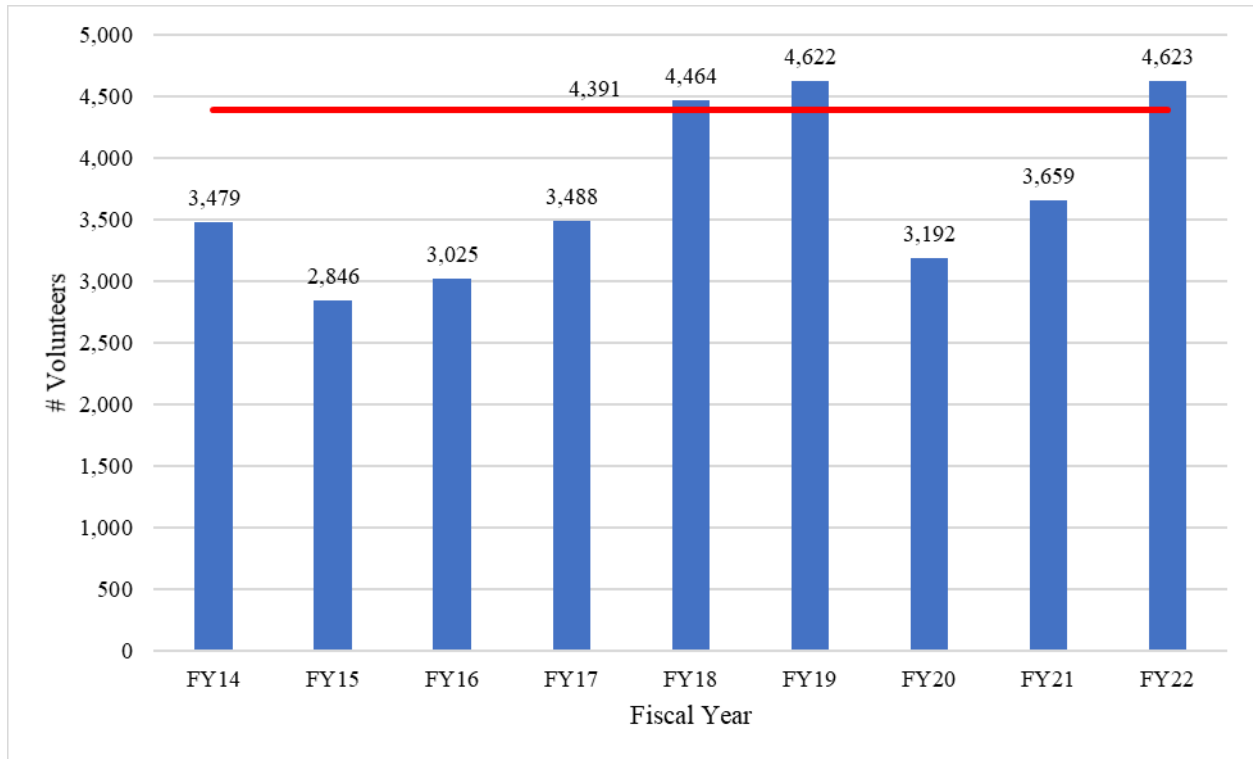


Figure 3: Number of Volunteers by Fiscal Year  
(Success = Increase in Volunteer Participation from 4,391)

## 5.2 Status of Improvements Identified for Implementation in FY2022

Table 9 provides the status of improvements in the Public Involvement and Participation Program that were identified in FY2021 for implementation in FY2022.

Table 9: Status of Improvements Identified for Implementation in FY2022

#	Improvements Identified for Implementation in FY2022	Desired Result	Program Element	Responsible Staff	Implementation Status
1	Develop a group/generic email account to be used for volunteers to send forms and data to, to prevent relying on individual email accounts during staff absences.	Streamline communication with volunteers	PI-2(f), PI-3(f)	David Caldwell	A volunteer email account has been implemented which has simplified communication.
2	Investigate promoting Volunteer Monitoring during our regular Volun-Thursdays events.	Increase volunteer activity	PE-10(n)	Taylor Mebane	Volunteer monitoring has been promoted during the VolunThursdays events.
3	Investigate adding a new “no infrastructure” key to the storm drain marking map on the web.	Improve management of storm drain marking program	PI-3(g)	Ashley Smith	The “no infrastructure” key has been added to the storm drain marking map which will help identify where storm drains are not

#	Improvements Identified for Implementation in FY2022	Desired Result	Program Element	Responsible Staff	Implementation Status
					available for marking.
4	Investigate hosting a plogging club for the Adopt a Stream program.	Increase volunteer activity	PI-2(g)	Taylor Mebane	The plogging club involvement is on-going. We have plans to involve plogging in FY23 Creek Week.
5	Host at least 2 tree planting events.	Increase volunteer activity	PE-10(m)	Ken Friday	Multiple tree planting events were held throughout the county in FY2022.
6	Promote compost recycling centers during municipal training.	Promote pollution prevention BMPs	PP-1(b)	Ken Friday	Composting education was added to municipal education.

### 5.3 Improvements Identified for Implementation in FY2023

Table 10 below provides the improvements in the Public Involvement and Participation Program that have been identified for implementation in FY2023.

Table 10: Improvements Identified for Implementation in FY2023

#	Improvements Identified for Implementation in FY23	Desired Result	Program Element	Responsible Staff
1	Finalize the new design of the Adopt a Stream sign.	Enhance effectiveness of signage.	PI-2	Taylor Mebane
2	Implement the Public Involvement components of the Underserved Communities Reach Plan, including researching potential events in underserved communities such as stream clean ups, storm drain marking events and tree plantings.	Increase volunteer activity in underserved communities.	PE-10	Taylor Mebane
3	Expand the Adopt a Drain program into another Phase II town.	Increase volunteer activity.	SBP Involvement	Ashley Smith
4	Investigate a Plogging event for Creek Week.	Increase volunteer activity.	PE-I(16)	Taylor Mebane
5	Investigate a new public involvement competition for students.	Increase volunteer activity.	PE-10	Ashley Smith



## Section 6: Illicit Discharge Detection and Elimination Program

CMSWS has developed, implemented and enforced an Illicit Discharge Detection and Elimination (IDDE) Program in Mecklenburg County's Phase II jurisdictions/entities. The goal of the IDDE Program is to detect and eliminate illicit discharges into the MS4, which are defined in 40 CFR 122.26(b)(2) as discharges that are not composed entirely of storm water except discharges pursuant to a NPDES Permit (other than the NPDES Permit for discharges from the municipal separate storm sewer) and discharges resulting from fire-fighting activities as well as incidental non-storm water discharges or flows that are not significant contributors of pollutants.

### 6.1 Implementation Status for FY2022

Table 11 describes the BMPs identified in the Storm Water Plan for the IDDE Program, and the specific actions completed between July 1, 2021 and June 30, 2022 (FY2022) for implementation of these BMPs as well as whether the measurable goals for the BMPs specified in the plan have been fulfilled.

Table 11: BMP Summary Table for the IDDE Program

BMP #	BMP Description	Implementation Actions	Goal Met																																																								
			Yes	No																																																							
19	Storm Sewer System Maps (ID-1)	In FY2022, 38 new inlets and 142 new outfalls were collected as summarized by jurisdiction in the table below. Most of the new collections came from the streamwalk program (ID-8) in FY2022. The ID-1 SOP was reviewed in August of 2021 and no revisions were made.	X																																																								
		<table><tr><th>Jurisdiction</th><th>Inlets</th><th>All Outfalls (≥12")</th><th>Major Outfalls (≥36")</th><th>Industrial Outfalls</th></tr><tr><td>Cornelius</td><td>6,284</td><td>897</td><td>32</td><td>0</td></tr><tr><td>Davidson</td><td>3,174</td><td>443</td><td>44</td><td>0</td></tr><tr><td>Huntersville</td><td>13,446</td><td>1,880</td><td>133</td><td>3</td></tr><tr><td>Matthews</td><td>6,229</td><td>848</td><td>39</td><td>3</td></tr><tr><td>Mint Hill</td><td>4,343</td><td>1,144</td><td>66</td><td>1</td></tr><tr><td>Pineville</td><td>3,685</td><td>601</td><td>14</td><td>0</td></tr><tr><td>Mecklenburg</td><td>10,432</td><td>2,129</td><td>99</td><td>4</td></tr><tr><td>CMS</td><td>5,441</td><td>841</td><td>27</td><td>0</td></tr><tr><td>CPCC</td><td>343</td><td>66</td><td>1</td><td>0</td></tr><tr><td>Total</td><td>53,377 (38 new)</td><td>8,849 (142 new)</td><td>452</td><td>11</td></tr></table>			Jurisdiction	Inlets	All Outfalls (≥12")	Major Outfalls (≥36")	Industrial Outfalls	Cornelius	6,284	897	32	0	Davidson	3,174	443	44	0	Huntersville	13,446	1,880	133	3	Matthews	6,229	848	39	3	Mint Hill	4,343	1,144	66	1	Pineville	3,685	601	14	0	Mecklenburg	10,432	2,129	99	4	CMS	5,441	841	27	0	CPCC	343	66	1	0	Total	53,377 (38 new)	8,849 (142 new)	452	11
		Jurisdiction			Inlets	All Outfalls (≥12")	Major Outfalls (≥36")	Industrial Outfalls																																																			
		Cornelius			6,284	897	32	0																																																			
		Davidson			3,174	443	44	0																																																			
		Huntersville			13,446	1,880	133	3																																																			
		Matthews			6,229	848	39	3																																																			
		Mint Hill			4,343	1,144	66	1																																																			
		Pineville			3,685	601	14	0																																																			
		Mecklenburg			10,432	2,129	99	4																																																			
		CMS			5,441	841	27	0																																																			
		CPCC			343	66	1	0																																																			
		Total			53,377 (38 new)	8,849 (142 new)	452	11																																																			
20	Screening for Non-Stormwater Flows (ID-2)	Screening for Non-Stormwater Flows were completed within the Phase II jurisdiction via penalty re-inspections and watershed/business corridor inspections between July 1 <sup>st</sup> , 2021 and June 30 <sup>th</sup> , 2022. Annual training for CMSWS staff regarding IDDE procedures were completed on October 28 <sup>th</sup> , 2021 for 21 CMSWS staff members. In FY2022, CMSWS reviewed NOV data to determine which businesses/properties have had repeat violations within the previous three (3) fiscal years within the Phase II jurisdiction. A total of 11 businesses/properties were identified for re-inspection. Penalty re-inspections were initiated in December 2021 and completed in March 2022. No violations to the stormwater ordinance were observed during the re-inspections of the 11 Sites. A summary of the Sites	X																																																								



BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		<p>in relation to municipality is shown below:</p> <ul style="list-style-type: none"> <li>• Cornelius (2)</li> <li>• Davidson (1)</li> <li>• Matthews (2)</li> <li>• Mecklenburg County Unincorporated (1)</li> <li>• Mint Hill (1)</li> <li>• Pineville (3)</li> </ul> <p>Watershed/business corridor areas were determined by reviewing the previous five (5) fiscal years of service request, NOV, and watershed with TMDL impairments. Watershed/business corridor inspections can involve inspecting a multitude of commercial businesses. These businesses can include – but not limited to – food services, single-family residential, multi-family residential facilities, and industrial facilities. In FY2022, a total of ten (10) watershed/business corridor inspections were completed within the Phase II jurisdiction. A summary of the inspections per towns is listed below:</p> <ul style="list-style-type: none"> <li>• Cornelius (2)</li> <li>• Davidson (1)</li> <li>• Huntersville (4)</li> <li>• Matthews (1)</li> <li>• Mint Hill (1)</li> <li>• Pineville (1)</li> </ul> <p>Out of the ten (10) watershed/business corridor inspections, three (3) requests for service were generated for food service businesses within the Phase II jurisdiction. Of the three (3) generated requests for service, three (3) NOVs were issued, one for each request. All the requests involved improper storage, handling, or processing of cooking oil/grease and resolved in 2022. No samples were collected under this program element within the Phase II jurisdiction. In the Phase II jurisdictions, 4 outfalls were inspected in FY2022 beyond the streamwalk program (ID-8). They were conducted under the service request and IDEP programs. No illicit discharges were detected, and no samples were collected.</p>		
21	Maintain an IDDE Program (ID-3)	<p>In FY2022, the IDDE Manual was reviewed and revised as necessary. A summary of the revisions is provided below:</p> <ul style="list-style-type: none"> <li>• IDEP SOP (<i>revisions completed on January 6, 2022</i>) - Revisions included, SOP template update, inclusion of language for watershed basin inspections (combining multi-family inspections and business corridor inspections), and removal of pet waste flagging program.</li> <li>• Multi-Family Residential Sanitary Sewer Overflow Prevention Program SOP (<i>revisions completed on November 17, 2021</i>) - Minor revisions, including revisions to SOP template.</li> <li>• CMSWS Illicit Discharge Detection and Elimination Program Manual (<i>revisions completed on June 30, 2022</i>) - Revisions included, SOP template format revisions, incorporation of the Phase I City ERP, updating Phase I enforcement procedures, text detailing investigation procedures involving high PAH sealant products, updating septic investigation methods, and text detailing watershed basin inspections.</li> </ul> <p>Annual CMSWS staff training under this program element was completed on October 28, 2021, for 21 staff members. In FY2022, a total of 21 IDDE inspections were completed within the Phase II jurisdiction. A detailed summary of IDDE investigations regarding NOVs, predominant</p>	X	

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		pollutant(s) and pollution source, predominant violation type, and problems detected and corrected in FY2022 by jurisdiction is described in BMP No. 20 under program element ID-2.		
22	Water Quality Monitoring Program (ID-4)	All monitoring activities were performed in line with quality assurance and quality control requirements stipulated in program QAPP and SOPs/SAPs. The QAPP and associated SOPs/SAPs were reviewed and/or revised as necessary to reflect changes in monitoring protocols in FY2022. In general, only minor changes were made to SOPs/SAPs for all monitoring programs, which mostly addressed staff or site changes. Annual staff training was completed for benthic macroinvertebrate (4/28/2022) and fish community (06/22/2022) monitoring programs. Monthly fixed interval stream monitoring was conducted at 10 sites in the Phase II jurisdiction (see Figure 4 for site locations). There was a total of 120 sampling events, generating 1784 individual parameter results in FY2022. Additional samples (14 samples from 9 sampling events) were collected and analyzed for fecal coliform and E. coli to validate the predictive fecal model at MY9. Ten sites were sampled for benthic macroinvertebrates, whilst fish community sampling was conducted at 4 Phase II sites. More information regarding these monitoring activities is provided below. Additional grab samples are completed on an as needed basis. The program renewed its NCDEQ water quality field parameter certification (#5235) in September 2021 and its biological laboratory certification in October 2021. Exceedances of water quality thresholds and actions initiated are discussed for each program below.	X	
23	Develop and Implement Fixed Interval Stream Monitoring Program (ID-4.1)	Fixed Interval Monitoring (FIM) SOP and SAP were reviewed and approved on 3/21/2022. Updates to SOPs/SAPs covered formatting changes and changes to the process for documenting proficiency in procedures during training of new personnel. Three new staff were trained and demonstrated proficiency in monitoring procedures, QA/QC, chain-of-custody and other protocols related to the collection, storage, transport and analysis of surface water samples under the FIM program. Monthly FIM was conducted at 10 sites (see Figure 4 for site locations; MC2A1, MC3E, MY15 are not FIM sites). At each site, samples were collected and analyzed for 16 water quality parameters as follows: ammonia-nitrogen, fecal coliform bacteria, TKN, nitrate/nitrite, total suspended solids, total phosphorus, e. coli, turbidity, suspended sediment, magnesium, calcium, hardness, and copper (dissolved). Lead (dissolved), chromium (total), and zinc (dissolved) were collected in the first month of each quarter. There was a total of 13 action level exceedances and 45 watch level exceedances during baseflow conditions. Action level exceedances comprised fecal coliform (4), total phosphorus (6), copper (1), and turbidity (2). Bacteria exceedances occurred at MC2, MC40C, MY10, and MY1B whilst total phosphorus exceeded threshold at MY10 (1) and MY14 (5). A copper and turbidity exceedance were observed at MY10. Turbidity was also elevated at MC36 on one occasion. Ongoing greenway and roadway construction continues to occur upstream of site MC40C resulting in increased instream sedimentation and the associated pollutants. Exceedances of copper and total phosphorus at MY10 have been attributed to a permitted discharge at Metrolina Greenhouses which is located upstream of this monitoring site. Staff are working with NCDEQ to reduce pollutant loading from this facility. Exceedances of total phosphorus at MY14 are associated with a package wastewater treatment facility located upstream. Table 12 below identifies the Baseflow Action and Watch level exceedances identified	X	

BMP #	BMP Description	Implementation Actions	Goal Met																																																																														
			Yes	No																																																																													
		through Fixed Interval Monitoring performed in the Phase II jurisdictions during FY2022.																																																																															
24	Develop and Implement Benthic/Habitat Monitoring Program (ID-4.3)	<p>The Benthic Macroinvertebrate Collection and Analysis Standard Operating Procedures were reviewed on May 5, 2022. No updates to the procedures were required. The Benthic Macroinvertebrate SOP was put into a new template that standardized the organization of all SOP topics. Staff training on bioassessment monitoring procedures, basic benthic macroinvertebrate identification and stream habitat assessment (EMAP) was conducted on June 24, 2022. Benthic macroinvertebrate sampling and habitat assessments (MHAP) were conducted at 10 stream monitoring sites located within the jurisdiction of the towns or in unconsolidated Mecklenburg County following the procedures described in the SOPs. The table below lists the jurisdiction for each sampling site as well as the MHAP score.</p> <table><tr><th>Stream</th><th>Site</th><th>Date</th><th>EPT Taxa</th><th>Total Taxa</th><th>NCIBI</th><th>Bioclass</th></tr><tr><td>McDowell Cr</td><td>MC2A1</td><td>09/13/21</td><td>13</td><td>42</td><td>6.7</td><td>Fair</td></tr><tr><td>McDowell Cr</td><td>MC4</td><td>07/14/21</td><td>15</td><td>55</td><td>6.25</td><td>Good-Fair</td></tr><tr><td>Torrence Cr</td><td>MC3E</td><td>09/13/21</td><td>3</td><td>26</td><td>7.33</td><td>Poor</td></tr><tr><td>Gar Cr</td><td>MC50</td><td>07/14/21</td><td>16</td><td>51</td><td>5.22</td><td>Good-Fair</td></tr><tr><td>Irvin Cr Tributary</td><td>MC36</td><td>09/01/21</td><td>4</td><td>32</td><td>7.3</td><td>Poor</td></tr><tr><td>West Branch Rocky R</td><td>MY1B</td><td>09/17/21</td><td>10</td><td>43</td><td>6.68</td><td>Fair</td></tr><tr><td>Clarks Cr</td><td>MY10</td><td>09/17/21</td><td>6</td><td>27</td><td>7.27</td><td>Fair</td></tr><tr><td>Clear Cr</td><td>MY8</td><td>08/04/21</td><td>15</td><td>50</td><td>5.94</td><td>Good-Fair</td></tr><tr><td>Goose Cr</td><td>MY9</td><td>09/09/21</td><td>8</td><td>34</td><td>6.63</td><td>Fair</td></tr><tr><td>Duck Cr</td><td>MY14</td><td>08/04/21</td><td>8</td><td>42</td><td>6.53</td><td>Fair</td></tr></table> <p>All benthic macroinvertebrate samples were identified to the lowest taxonomic level using the most up-to-date identification manuals available. The samples were analyzed for Total taxa and EPT Richness and NC Biotic Index. The results are provided in the table below. No significant problems were detected through the annual monitoring activities. The Stream Bioclassification and MHAP scores indicate that most of the urban streams in Mecklenburg County do not support a large diversity of aquatic benthic macroinvertebrates and have habitat conditions rated as either partially supporting or impaired. However, some urban streams can support large numbers of organisms representing a small number of different species. These results indicate that local, urban streams are subject to habitat impairment through stream bank erosion and are receiving a wide variety of point and nonpoint source pollutants, including industrial discharges, sewer line leaks, treated wastewater treatment plant effluent and storm water pollutants such as lawn treatment chemicals, petroleum hydrocarbons and heavy metals in road runoff. One positive improvement seen in the urban streams in Phase II is the upgrading of the Bioclassification of McDowell Creek at MC4 from Fair to Good-Fair which also resulted in the change in designation of McDowell from the 303(d) list to the 303(a) list. By contrast, the rural streams in surrounding Mecklenburg County, including Gar (MC50) and Clear (MY8) Creeks support a wide diversity of aquatic fauna. Stream pollutants often associated with urbanized areas are generally not present in rural streams allowing the sensitive macroinvertebrate groups, Ephemeroptera, Plecoptera and Trichoptera, to flourish.</p>	Stream	Site	Date	EPT Taxa	Total Taxa	NCIBI	Bioclass	McDowell Cr	MC2A1	09/13/21	13	42	6.7	Fair	McDowell Cr	MC4	07/14/21	15	55	6.25	Good-Fair	Torrence Cr	MC3E	09/13/21	3	26	7.33	Poor	Gar Cr	MC50	07/14/21	16	51	5.22	Good-Fair	Irvin Cr Tributary	MC36	09/01/21	4	32	7.3	Poor	West Branch Rocky R	MY1B	09/17/21	10	43	6.68	Fair	Clarks Cr	MY10	09/17/21	6	27	7.27	Fair	Clear Cr	MY8	08/04/21	15	50	5.94	Good-Fair	Goose Cr	MY9	09/09/21	8	34	6.63	Fair	Duck Cr	MY14	08/04/21	8	42	6.53	Fair	X	
Stream	Site	Date	EPT Taxa	Total Taxa	NCIBI	Bioclass																																																																											
McDowell Cr	MC2A1	09/13/21	13	42	6.7	Fair																																																																											
McDowell Cr	MC4	07/14/21	15	55	6.25	Good-Fair																																																																											
Torrence Cr	MC3E	09/13/21	3	26	7.33	Poor																																																																											
Gar Cr	MC50	07/14/21	16	51	5.22	Good-Fair																																																																											
Irvin Cr Tributary	MC36	09/01/21	4	32	7.3	Poor																																																																											
West Branch Rocky R	MY1B	09/17/21	10	43	6.68	Fair																																																																											
Clarks Cr	MY10	09/17/21	6	27	7.27	Fair																																																																											
Clear Cr	MY8	08/04/21	15	50	5.94	Good-Fair																																																																											
Goose Cr	MY9	09/09/21	8	34	6.63	Fair																																																																											
Duck Cr	MY14	08/04/21	8	42	6.53	Fair																																																																											

BMP #	BMP Description	Implementation Actions							Goal Met	
									Yes	No
		Stream	Site	Date	EPT Taxa	Total Taxa	NCIBI	Bioclass		
		McDowell Cr	MC2A1	09/13/21	13	42	6.7	Fair		
		McDowell Cr	MC4	07/14/21	15	55	6.25	Good-Fair		
		Torrence Cr	MC3E	09/13/21	3	26	7.33	Poor		
		Gar Cr	MC50	07/14/21	16	51	5.22	Good-Fair		
		Irvins Cr Tributary	MC36	09/01/21	4	32	7.3	Poor		
		West Branch Rocky R	MY1B	09/17/21	10	43	6.68	Fair		
		Clarkes Cr	MY10	09/17/21	6	27	7.27	Fair		
		Clear Cr	MY8	08/04/21	15	50	5.94	Good-Fair		
		Goose Cr	MY9	09/09/21	8	34	6.63	Fair		
		Duck Cr	MY14	08/04/21	8	42	6.53	Fair		
25	Develop and Implement Fish Monitoring Program (ID-4.4)	Mecklenburg County follows the NCDEQ Fish Community Assessment methods which includes electrofishing wadable streams for a 200-meter stretch; collecting, identifying, measuring, and counting all fish collected. This data is then entered into a database that calculates the North Carolina Index of Biotic Integrity (NCIBI) score for each record. These methods are utilized so data from Mecklenburg County can consistently be compared to other locations throughout North Carolina. Standard operating procedure were reviewed and updated to the most current format in April 2022. Staff training for 2022 was conducted on April 28, 2022 in the field at Little Sugar Creek Greenway. Fish community assessments were conducted at 3 sites in Mecklenburg County’s Phase II jurisdiction. The results are provided in the table below. In fiscal year 2022, two sites were within the Town of Matthews (MC36 and MC40C), and one site was within the unincorporated county / Mint Hill ETJ (MY14).							X	
		Date	Site	Creek	NCIBI	NCIBI Rating				
		5/25/22	MC36	Irvin’s Creek Trib.	34*	Poor*				
		6/6/22	MC40C	Fourmile Creek	42	Good-Fair				
		6/23/22	MY14	Duck Creek	46	Good-Fair				
		*The NCIBI score and rating for site MC36 are not valid because the drainage area is less than 2.8 square miles.								
		Of the three Phase II sites that were sampled this year, site MC36 scored the lowest with an NCIBI of 34 and an NCIBI rating of “Poor”. MC36 has been assessed for fish assemblage four times prior to this year’s sampling effort (2003, 2011, 2015, 2018) and every assessment returned an NCIBI rating of “Poor”. MC36 is hindered greatly by lack of stream flow and dissolved oxygen, as well as overall minimal habitats for aquatic biodiversity. CMSWS staff does not predict the fish assemblage to drastically improve in diversity and population anytime soon. Sites MC40C and MY14 both returned a NCIBI rating of “Good-Fair”, with MY14 having a slightly higher NCIBI score than MC40C. Both sites have excellent water quality with a diversity of substrate and habitat structures. The limiting factor for these two locations for healthy fish assemblages is water flow. If the region receives drought-like conditions over a period of time before future monitoring efforts, the fish assemblage could be negatively affected.								
26	Water Quality Monitoring Data QA/QC (ID-4.6)	Review of field and laboratory data was performed routinely when data is uploaded by field staff or transferred electronically into the water quality database (WQD) by Charlotte Water analytical lab. All field and laboratory blank data were assessed to ensure compliance with QA/QC requirements. In FY2022, a total of 496 field blanks were analyzed as part of FIM program in Phase 2 jurisdiction. Two blanks exceeded the reporting limit for calcium in 8/17/2021 and 2/15/2022. A total of 1798 laboratory sample records were reviewed and approved or rejected as							X	

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		appropriate. Additional review of field data and biological data occurred on an as-needed basis throughout the year.		
27	Problem Area Identification and Elimination (ID-4.7)	The overall SUSI index for FY2022 showed that the streams are partially supporting their designated uses based on the water quality parameters examined. Review of SUSI data suggests ongoing water quality issues at MY10 (Clarke Creek) including elevated nutrient levels in the watershed. Efforts have been undertaken in this watershed in the past to identify and mitigate sources of nutrients and dissolved metals reaching the stream. As part of these efforts a detailed analysis of trends in nutrient loading, particularly total phosphorus loads in the watershed, has been initiated to understand changes in nutrient loads over time. Results of trend and watershed level analysis is expected to be available in the early part of FY2023. This information will be useful for making management decisions about the corrective actions to mitigate nutrient loading in the watershed.	X	
28	CMANN (ID-4.10)	During FY2022, CMSWS conducted continuous automated monitoring activities at 7 sites in the Phase II jurisdictions resulting in the collection of 377,041 QA/QC accepted data points (~85% data acceptance rate). Sensors were used to collect the following water quality parameters: conductivity, oxygen, pH, temperature, and turbidity. All data collected was evaluated for the identification of potential pollution problems and general water quality trends. Current data can be observed on the following website: <a href="http://cmann.mecknc.gov">http://cmann.mecknc.gov</a> . CMANN data is used to help calculate the Stream Use Support Index (SUSI), which is a general indicator of water quality conditions in our streams. This index was made available to the public on the website as follows: <a href="http://stormwater.charmeck.org">http://stormwater.charmeck.org</a> (select "Water Quality" at the top of the page). The Phase II sites include MC4 – McDowell Creek (Huntersville), MC40D – Four Mile Creek (Matthews), MC50 – Gar Creek (Huntersville), MY1B – West Branch Rocky River (Davidson), MY8 – Clear Creek (Mint Hill), MY9 – Goose Creek (Mint Hill), MY10 – Clarke Creek (Huntersville). In fiscal year 2022, CMSWS CMANN equipment did not observe or detect any pollution problems in the Phase 2 jurisdictions. Beginning in 2022, CMSWS began integrating cameras into all monitoring sites throughout Mecklenburg County. As of June 13 <sup>th</sup> , 2021, one Phase II CMANN site, McDowell Creek @ Beatties Ford Rd. (MC4), was equipped with a camera that takes an image every 1 hour. These images are intended to provide technicians with a visual display of the creek to compare with the water quality data provided by the EXO2 sonde and reduce unnecessary field visits. In FY22, CMANN staff will continue to install cameras in more Phase II monitoring locations and remain diligent in maintaining the equipment to ensure that we retain the highest quality data possible. Beginning in FY21, a new fecal predictive model was added to the CMANN website for select sites. On May 20, 2021, the fecal predictive model was applied to Goose Creek @ Stevens Mill Rd. (MY9). Throughout FY22, samples were collected to confirm the accuracy of the model and assessment of the model is ongoing. In FY23, the model will be applied to McDowell Creek @ Beatties Ford Rd. (MC4). The CMANN SOP was reviewed and revised in March of 2022.	X	
29	Quality Assurance Project Plan Administration	CMSWS administers a quality assurance project plan (QAPP) for the purpose of standardizing monitoring activities and protocols in accordance with approved methods. This QAPP was approved by NCDEQ in 2009. All SOPs for the monitoring program were review/revised and approved	X	

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
	(QAPP)	in FY2022. The WQP quality assurance project plan (QAPP) was updated as part of the biennial review process. Revisions included new document format, changes in staff, and other minor revisions to improve the overall quality of the document. Field audits for monitoring program was not performed in FY2022 to allow enough time for new staff to be trained in SOPs and proper field procedures.		
30	Pollution Prevention Education (ID-5)	The FY2022 media campaign included social media posts regarding identifying and reporting illicit discharges. Utility bill inserts (UBIs) were also used for getting this message out, as well as county vehicle wraps and radio and TV messages. CMSWS is also a member of the Regional Storm Water Partnership of the Carolinas which participates in a TV media campaign to promote reporting pollution and illicit discharges. On August 30, 2021, a media plan was created for FY2022 that focused education regarding pollution prevention and pollution reporting based on CMSWS's targeted pollutants. During FY2022, all webpages were checked for broken links and for up-to-date information. Messages were incorporated into the general water quality media campaign during FY22 to inform citizens of illicit discharges and improper waste disposal and how they threaten the environment. On January 12, 2022 and June 1, 2022, social media posts were sent to the Town of Mint Hill covering how rain barrels can be used at homes to practice sustainable water usage and proper cooking oil and grease disposal, respectively. All the Towns were contacted at the beginning of each month and made aware of dates when relevant social media posts would be on the CMSWS channels for the Towns to share with their followers. During FY2022, the Stormy mascot was used in several social media posts and a couple of school presentations to promote pollution prevention. Handouts were reviewed and made available for staff to handout on a variety of topics including pollution prevention (residential pollution sources and business/commercial sources) and volunteering. During FY2022, CMSWS participated in 15 events and gave 47 presentations. This does not include presentations to schools or municipal facility education. The events included various festivals, trade shows, and clinics. The presentations were given to a variety of audiences including homeowner associations, civic groups, and business groups. These events and presentations (listed under PE-9) included providing education about pollution prevention and reporting. On January 24, 2022, the video used to train municipal staff regarding water pollution was resent to those departments that had minimal participation in recent years, including Code Enforcement, Solid Waste, Department of Social Service, and the Sheriff's Dept. On January 27, 2022, 311 keywords and 311 SOPs were reviewed by CMSWS to ensure that Water Quality related calls for pollution prevention, pollution reporting, and volunteer opportunities are being sent to the correct department.	X	
31	Follow up Inspections and Responding to Citizen Requests and Emergencies (ID-6)	During FY2022, SOPs under this program element were updated between January 5 <sup>th</sup> and 21 <sup>st</sup> , 2022. A summary of SOP updates is described below: <ul style="list-style-type: none"> <li>CMSWS Emergency Response Manual (<i>revisions completed on January 21, 2022</i>) - Revisions included, SOP template update, staff compensation, update staff position categories, and updates to assist CMSWS staff with discerning when immediate response to an ER event is required.</li> <li>Procedures for Responding to Resident Requests for Service (<i>revisions completed on January 5, 2022</i>) - Minor revisions, term</li> </ul>	X	



BMP #	BMP Description	Implementation Actions	Goal Met																																																																																																																																																																																								
			Yes	No																																																																																																																																																																																							
		<p>“citizen” revised to “resident”.</p> <p>Annual CMSWS staff training under this program element were completed on September 22, 2021. A total of 23 CMSWS staff members were in attendance during this training event. During FY2022, a total of 85 service request were received and responded to within the Phase II jurisdiction. In FY2022, a total of 15 emergency response request for service were received and responded to. In FY2022, a total of 53 problems were detected and resolved. A total of 23 NOVs were issued with 19 NOVs being resolved within the Phase II jurisdiction in FY2022. A summary of this data by jurisdiction is provided in the table below.</p> <table><tr><th>Jurisdiction</th><th>SR</th><th>ER SR (of total SR)</th><th>NOVs Issued</th><th>NOVs Resolved</th><th>Problems Detected</th><th>Problems Corrected</th></tr><tr><td>Cornelius</td><td>16</td><td>1</td><td>7</td><td>5</td><td>8</td><td>8</td></tr><tr><td>Davidson</td><td>4</td><td>1</td><td>0</td><td>0</td><td>3</td><td>3</td></tr><tr><td>Huntersville</td><td>17</td><td>2</td><td>4</td><td>3</td><td>12</td><td>12</td></tr><tr><td>Matthews</td><td>17</td><td>3</td><td>4</td><td>4</td><td>9</td><td>9</td></tr><tr><td>Mecklenburg</td><td>23</td><td>7</td><td>6</td><td>6</td><td>15</td><td>15</td></tr><tr><td>Mint Hill</td><td>5</td><td>1</td><td>1</td><td>1</td><td>4</td><td>4</td></tr><tr><td>Pineville</td><td>3</td><td>0</td><td>1</td><td>0</td><td>2</td><td>2</td></tr><tr><td><b>Total</b></td><td><b>85</b></td><td><b>15</b></td><td><b>23</b></td><td><b>19</b></td><td><b>53</b></td><td><b>53</b></td></tr></table> <p>During FY22, of the 23 NOVs issued within the Phase II jurisdiction the predominant pollution source was observed to be businesses related to construction. A summary of pollution sources per jurisdiction is provided in the table below.</p> <table><tr><th>Pollution Source</th><th>Cornelius</th><th>Davidson</th><th>Huntersville</th><th>Matthews</th><th>Mecklenburg</th><th>Mint Hill</th><th>Pineville</th></tr><tr><td>Cleaning Services</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Contractor (Repairs/Construction/Installation/Maintenance)</td><td>5</td><td>0</td><td>0</td><td>1</td><td>3</td><td>0</td><td>0</td></tr><tr><td>Food Services</td><td>1</td><td>0</td><td>3</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Other</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Residence</td><td>0</td><td>0</td><td>0</td><td>2</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Retail/Wholesale</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td></tr><tr><td>Warehouse/Storage</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr><tr><td>Waste Management/Disposal/Hauling/Recycling</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr><tr><td>Water/Sewer Utility</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr></table> <p>Within the Phase II jurisdiction, the primary pollution source encountered when responding to SR were associated with SSO from municipal sources. A summary of the total number and type of service requests and type of pollutant per jurisdiction is provided in the table below.</p> <table><tr><th>Material Discharged</th><th>Cornelius</th><th>Davidson</th><th>Huntersville</th><th>Matthews</th><th>Mecklenburg</th><th>Mint Hill</th><th>Pineville</th></tr><tr><td>Allowable discharge</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr><tr><td>Concrete</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Cooking oil/grease</td><td>2</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Fertilizer</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr></table>	Jurisdiction	SR	ER SR (of total SR)	NOVs Issued	NOVs Resolved	Problems Detected	Problems Corrected	Cornelius	16	1	7	5	8	8	Davidson	4	1	0	0	3	3	Huntersville	17	2	4	3	12	12	Matthews	17	3	4	4	9	9	Mecklenburg	23	7	6	6	15	15	Mint Hill	5	1	1	1	4	4	Pineville	3	0	1	0	2	2	<b>Total</b>	<b>85</b>	<b>15</b>	<b>23</b>	<b>19</b>	<b>53</b>	<b>53</b>	Pollution Source	Cornelius	Davidson	Huntersville	Matthews	Mecklenburg	Mint Hill	Pineville	Cleaning Services	1	0	0	0	0	0	0	Contractor (Repairs/Construction/Installation/Maintenance)	5	0	0	1	3	0	0	Food Services	1	0	3	1	0	0	0	Other	0	0	1	0	0	0	0	Residence	0	0	0	2	0	0	0	Retail/Wholesale	0	0	0	0	0	1	1	Warehouse/Storage	0	0	0	0	1	0	0	Waste Management/Disposal/Hauling/Recycling	0	0	0	0	1	0	0	Water/Sewer Utility	0	0	0	0	1	0	0	Material Discharged	Cornelius	Davidson	Huntersville	Matthews	Mecklenburg	Mint Hill	Pineville	Allowable discharge	0	0	1	1	1	0	0	Concrete	0	1	0	0	0	0	0	Cooking oil/grease	2	0	1	0	0	0	0	Fertilizer	0	0	0	0	1	0	0		
Jurisdiction	SR	ER SR (of total SR)	NOVs Issued	NOVs Resolved	Problems Detected	Problems Corrected																																																																																																																																																																																					
Cornelius	16	1	7	5	8	8																																																																																																																																																																																					
Davidson	4	1	0	0	3	3																																																																																																																																																																																					
Huntersville	17	2	4	3	12	12																																																																																																																																																																																					
Matthews	17	3	4	4	9	9																																																																																																																																																																																					
Mecklenburg	23	7	6	6	15	15																																																																																																																																																																																					
Mint Hill	5	1	1	1	4	4																																																																																																																																																																																					
Pineville	3	0	1	0	2	2																																																																																																																																																																																					
<b>Total</b>	<b>85</b>	<b>15</b>	<b>23</b>	<b>19</b>	<b>53</b>	<b>53</b>																																																																																																																																																																																					
Pollution Source	Cornelius	Davidson	Huntersville	Matthews	Mecklenburg	Mint Hill	Pineville																																																																																																																																																																																				
Cleaning Services	1	0	0	0	0	0	0																																																																																																																																																																																				
Contractor (Repairs/Construction/Installation/Maintenance)	5	0	0	1	3	0	0																																																																																																																																																																																				
Food Services	1	0	3	1	0	0	0																																																																																																																																																																																				
Other	0	0	1	0	0	0	0																																																																																																																																																																																				
Residence	0	0	0	2	0	0	0																																																																																																																																																																																				
Retail/Wholesale	0	0	0	0	0	1	1																																																																																																																																																																																				
Warehouse/Storage	0	0	0	0	1	0	0																																																																																																																																																																																				
Waste Management/Disposal/Hauling/Recycling	0	0	0	0	1	0	0																																																																																																																																																																																				
Water/Sewer Utility	0	0	0	0	1	0	0																																																																																																																																																																																				
Material Discharged	Cornelius	Davidson	Huntersville	Matthews	Mecklenburg	Mint Hill	Pineville																																																																																																																																																																																				
Allowable discharge	0	0	1	1	1	0	0																																																																																																																																																																																				
Concrete	0	1	0	0	0	0	0																																																																																																																																																																																				
Cooking oil/grease	2	0	1	0	0	0	0																																																																																																																																																																																				
Fertilizer	0	0	0	0	1	0	0																																																																																																																																																																																				



BMP #	BMP Description	Implementation Actions							Goal Met	
									Yes	No
		Material Discharged	Cornelius	Davidson	Huntersville	Matthews	Mecklenburg	Mint Hill	Pineville	
		Motor oil	0	0	0	2	3	0	1	
		None	3	1	4	6	6	0	1	
		Other	3	0	9	5	2	3	0	
		Paint	0	0	0	0	1	0	0	
		Petroleum fuels	0	0	1	1	7	0	0	
		Sediment	0	0	0	1	1	0	0	
		Sewage - CMU	7	1	1	1	3	1	0	
		Sewage - private (commercial/apartment)	0	1	0	2	0	0	1	
		Sewage - septic system	0	0	0	0	0	1	0	
		Trash	0	0	0	0	1	0	0	
		Unknown	1	0	1	2	0	0	0	
		Wash water	0	0	1	1	1	0	0	
		Yard waste	0	0	0	4	1	1	0	
		Total SR No.	16	4	19	26	28	6	3	
32	Stream Walk/Outfall Inventory & Inspection/ Dry Weather Flow Analysis (ID-8)	During FY2022, policies and procedures for the stream walk program were reviewed and updated as necessary. On October 20, 2021, staff training was completed. Stream walks began on November 1, 2021 and concluded on April 25, 2022. Staff walked approximately 127.7 total stream miles in the Phase II area during FY2022. 71.38 of the total miles were walked in Phase II basins and 54.32 miles were walked in the Phase I ETJ. In total, there were 179 data points collected. 46 of these data points were new features and the remaining 133 points were outfall inspections. There were 65 new outfalls recorded, 68 existing outfalls inspected, and 5 dry weather flows (DWFs) identified. There were no samples collected from the DWFs because they were either too low to sample or draining from a BMP. Three (3) significant problems and eleven (11) stream blockages were identified and reported to Mecklenburg-County Storm Water Services Operations Department. Staff also identified six (6) potential stream buffer violations, two (2) dry channels, six (6) private arials, three (3) reference reaches, four (4) instances of severe bank erosion, and two (2) new wetland areas. Six (6) beaver dams were recorded, and the data was reported to Charlotte- Mecklenburg Storm Water Operations to track. One (1) illicit discharge pollution source was observed, which resulted in a Notice of Violation being issued. QA/QC was performed on all monitoring data generated under this program. Overall, stream walk data was collected with consistency throughout all teams in the FY2022 season. Figure 5 identifies the basins and stream reaches that were walked and outfalls collected and re-inspected during Phase II FY2022 stream walk activities.							X	
33	Illicit Discharge Elimination Program (IDEP) (ID-9)	During FY22, the SOPs under this program element were updated and revised as necessary. A summary of the SOP revisions is provided below. <ul style="list-style-type: none"> <li>• IDEP SOP (<i>revisions completed on January 6, 2022</i>) - Revisions included, SOP template update, inclusion of language for watershed basin inspections (combining multi-family inspections and business corridor inspections), and removal of pet waste flagging program.</li> <li>• CMSWS Illicit Discharge Detection and Elimination Program Manual</li> </ul>							X	

BMP #	BMP Description	Implementation Actions	Goal Met																																																	
			Yes	No																																																
		<p>(revisions completed on June 30, 2022) - Revisions included, SOP template format revisions, incorporation of the Phase I City ERP, updating Phase I enforcement procedures, text detailing investigation procedures involving high PAH sealant products, updating septic investigation methods, and text detailing watershed basin inspections. Annual CMSWS staff training under this program element was completed on October 28, 2021 for 21 staff members, including, but not limited to, IDDE/SR investigation procedures, SSO investigations, problem area investigations, watershed basin inspections, and enforcement procedures. IDEP activities were initiated between July 1, 2021, and through June 30, 2022. A summary table for IDEP penalty re-inspection dates completed in FY22 within the Phase II jurisdiction is provided below.</p> <table><tr><th>Jurisdiction</th><th>Previous Violation</th><th>Penalty Re-Inspection Completion Date</th><th>Activity Report #</th></tr><tr><td>Cornelius</td><td>Sewage – Private (residential)</td><td>12/17/2021</td><td>64383</td></tr><tr><td>Matthews</td><td>Sewage – Illicit Discharge</td><td>3/8/2022</td><td>66824</td></tr><tr><td>Matthews</td><td>Sewage – Private (residential)</td><td>3/3/2022</td><td>66831</td></tr><tr><td>Mecklenburg</td><td>Sewage – Private (multifamily)</td><td>12/21/2021</td><td>64420</td></tr><tr><td>Mecklenburg</td><td>Sewage – Private (commercial/apartment)</td><td>12/21/2021</td><td>64467</td></tr><tr><td>Mint Hill</td><td>Sewage – Private (residential)</td><td>3/9/2022</td><td>66822</td></tr><tr><td>Pineville</td><td>Sediment</td><td>12/13/2021</td><td>64334</td></tr><tr><td>Pineville</td><td>Other</td><td>12/13/2021</td><td>66793</td></tr><tr><td>Pineville</td><td>Sewage – Private (commercial/apartment)</td><td>12/13/2021</td><td>66781</td></tr><tr><td>Cornelius</td><td>Sewage – Private (commercial/apartment)</td><td>3/11/2022</td><td>66868</td></tr><tr><td>Davidson</td><td>Sewage – Private (commercial/apartment)</td><td>3/11/2022</td><td>66867</td></tr></table> <p>In FY22, IDEP watershed basin/business corridor inspections were completed for areas with the Phase II jurisdiction (Cornelius, Davidson, Huntersville, Matthews, Mint Hill, and Pineville) on June 23, 2022. A summary of total FY22 IDEP (formerly known as ISIS) activities, inspections, NOVs, problems detected/corrected, type of pollutants, and sources within the Phase II jurisdiction is described in the previous BMP Section No. 20 (ID-2) and 21 (ID-3).</p>	Jurisdiction	Previous Violation	Penalty Re-Inspection Completion Date	Activity Report #	Cornelius	Sewage – Private (residential)	12/17/2021	64383	Matthews	Sewage – Illicit Discharge	3/8/2022	66824	Matthews	Sewage – Private (residential)	3/3/2022	66831	Mecklenburg	Sewage – Private (multifamily)	12/21/2021	64420	Mecklenburg	Sewage – Private (commercial/apartment)	12/21/2021	64467	Mint Hill	Sewage – Private (residential)	3/9/2022	66822	Pineville	Sediment	12/13/2021	64334	Pineville	Other	12/13/2021	66793	Pineville	Sewage – Private (commercial/apartment)	12/13/2021	66781	Cornelius	Sewage – Private (commercial/apartment)	3/11/2022	66868	Davidson	Sewage – Private (commercial/apartment)	3/11/2022	66867		
Jurisdiction	Previous Violation	Penalty Re-Inspection Completion Date	Activity Report #																																																	
Cornelius	Sewage – Private (residential)	12/17/2021	64383																																																	
Matthews	Sewage – Illicit Discharge	3/8/2022	66824																																																	
Matthews	Sewage – Private (residential)	3/3/2022	66831																																																	
Mecklenburg	Sewage – Private (multifamily)	12/21/2021	64420																																																	
Mecklenburg	Sewage – Private (commercial/apartment)	12/21/2021	64467																																																	
Mint Hill	Sewage – Private (residential)	3/9/2022	66822																																																	
Pineville	Sediment	12/13/2021	64334																																																	
Pineville	Other	12/13/2021	66793																																																	
Pineville	Sewage – Private (commercial/apartment)	12/13/2021	66781																																																	
Cornelius	Sewage – Private (commercial/apartment)	3/11/2022	66868																																																	
Davidson	Sewage – Private (commercial/apartment)	3/11/2022	66867																																																	
34	Used Oil Inspections (ID-U)	<p>The purpose of the used oil facility inspection program is to ensure the proper handling and disposal of used oil and to identify and elimination pollution sources threatening downstream water quality conditions. In FY22, the scope of this program was broadened to include facilities that conduct automotive repair and maintenance, but do not accept used oil from the public. This program update was conducted to more effectively identify and eliminate pollution sources within the Phase II jurisdictions. In FY22, two (2) inspections were conducted at vehicle maintenance facilities within the Phase II jurisdictions as described below.</p> <ul style="list-style-type: none"><li>Mint Hill Automotive, 8329B Fairview Road, Mint Hill, inspected on May 26, 2022. Inspection Result: Report was issued as “Satisfactory” with recommendations regarding product removal information, outdoor material and vehicle storage areas, and indoor material storage areas.</li><li>Hamptons Mobile Service, 503 N. Old Statesville Road, Huntersville, inspected on May 20, 2022. Inspection Result: Report was issued as</li></ul>	X																																																	

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		<p>“Satisfactory” with a recommendation for adding absorbent spill kits. An online interactive map is posted on CMSWS’s website to assist citizens in locating a facility that accepts used oil and other automotive wastes. The link is as follows:  <a href="http://maps.co.mecklenburg.nc.us/website/recyclecenters/">http://maps.co.mecklenburg.nc.us/website/recyclecenters/</a></p>		
35	Evaluate Effectiveness of IDDE Program (ID-10)	<p>During FY2022, new capabilities for transferring outfall inspections from the streamwalk program (ID-8) into Cityworks were completed. Utilizing the CMSWS EDMS software, staff were able to pull the outfall collection data from the geodatabase, edit the data if needed, and submit it into Cityworks where individual outfall inspections are created in Cityworks for each asset inspected. This serves to create a new record for every outfall inspection and helps ensure the data is not lost. During FY2022, several areas for improvement of the IDDE Program that were identified in FY2021 were implemented as described in Table 12 below. Section 5.3 below provides a list of recommended improvements that will be implemented in FY23. There are three (3) measures of success for the IDDE Program contained in the Storm Water Plan. The status of these measures for FY2022 is described below:</p> <ul style="list-style-type: none"> <li>• <u>Documentation of storm water program activities</u> - In FY2022, all documentation was successfully completed and entered into the Cityworks software and the Cityworks Attachment Folders on the Mecklenburg County LAN.</li> <li>• <u>Increase in the Ratio of the number of regulatory violations compared to the number of inspections</u> - In general, the IDDE Program is successful at identifying and eliminating pollution sources. In FY2022, the ratio of the number of notices of violation (NOVs) issued to the number of inspections conducted was 7.59% based on 316 inspections and 24 NOVs issued. The target is an increase in the average of the percentages for the past three (3) years, which in FY2022 was 9.42%. An increase represents more NOVs issued compared to the number of inspections conducted which is the desired outcome. Figure 6 below indicates 7.59% for FY2022, which is not the desired trend.</li> <li>• <u>Decreasing the number of repeat violators</u> - This measure of success was added in FY21 as an additional way to monitor the effectiveness of our IDDE efforts. We consider a responsible party a repeat violator if they violate the Phase 1 or Phase 2 ordinances multiple times anywhere in Mecklenburg County within a 3-year time frame. The measure of success is the percentage of the number of repeat violators to the number of notices of violation issued, which for FY2022 was 15.17% or 22 out of 145 NOVs issued. The target is a decrease from the average percentage of the previous three (3) fiscal years, which was 15.80% for FY2022. The decrease in FY2022 indicates success at reducing repeat violators (see Figure 7).</li> </ul>	X	

Table 12: Action/Watch Level Exceedances Identified by Fixed Interval Monitoring

Storm Impacted?	Site Name	Date Collected	Analyte	Result	Unit	Flag
No	MC2	7/22/2021	Fecal Coliform	3200	CFU/100 ml	Action
No	MC2	10/21/2021	Fecal Coliform	570	CFU/100 ml	Watch
No	MC2	7/22/2021	Total Phosphorus	0.053	mg/L	Watch
No	MC36	11/16/2021	Fecal Coliform	220	CFU/100 ml	Watch

Storm Impacted?	Site Name	Date Collected	Analyte	Result	Unit	Flag
No	MC36	6/21/2022	Fecal Coliform	445	CFU/100 ml	Watch
No	MC36	10/19/2021	Total Phosphorus	0.058	mg/L	Watch
No	MC36	11/16/2021	Total Phosphorus	0.088	mg/L	Watch
No	MC36	12/7/2021	Total Phosphorus	0.068	mg/L	Watch
No	MC36	6/21/2022	Total Phosphorus	0.084	mg/L	Watch
No	MC36	11/16/2021	Turbidity	80	NTU	Action
No	MC4	7/22/2021	Fecal Coliform	880	CFU/100 ml	Watch
No	MC4	6/21/2022	Fecal Coliform	330	CFU/100 ml	Watch
No	MC4	11/18/2021	Total Phosphorus	0.055	mg/L	Watch
No	MC40C	10/19/2021	Fecal Coliform	450	CFU/100 ml	Watch
No	MC40C	11/16/2021	Fecal Coliform	620	CFU/100 ml	Watch
No	MC40C	12/7/2021	Fecal Coliform	384	CFU/100 ml	Watch
No	MC40C	2/15/2022	Fecal Coliform	1600	CFU/100 ml	Action
No	MC40C	6/21/2022	Fecal Coliform	660	CFU/100 ml	Watch
No	MC40C	12/7/2021	Total Phosphorus	0.066	mg/L	Watch
No	MC50	7/22/2021	Fecal Coliform	520	CFU/100 ml	Watch
No	MC50	10/21/2021	Fecal Coliform	430	CFU/100 ml	Watch
No	MC50	2/15/2022	Fecal Coliform	740	CFU/100 ml	Watch
No	MC50	7/22/2021	Total Phosphorus	0.084	mg/L	Watch
No	MC50	11/18/2021	Total Phosphorus	0.062	mg/L	Watch
No	MC50	6/21/2022	Total Phosphorus	0.083	mg/L	Watch
No	MY10	7/22/2021	Fecal Coliform	5400	CFU/100 ml	Action
No	MY10	7/22/2021	Copper	7.7	ug/L	Action
No	MY10	10/21/2021	Fecal Coliform	210	CFU/100 ml	Watch
No	MY10	6/21/2022	Fecal Coliform	250	CFU/100 ml	Watch
No	MY10	7/22/2021	Total Phosphorus	0.92	mg/L	Action
No	MY10	10/21/2021	Total Phosphorus	0.051	mg/L	Watch
No	MY10	7/22/2021	Turbidity	80	NTU	Action
No	MY14	7/22/2021	Fecal Coliform	216	CFU/100 ml	Watch
No	MY14	2/15/2022	Fecal Coliform	250	CFU/100 ml	Watch
No	MY14	3/15/2022	Fecal Coliform	540	CFU/100 ml	Watch
No	MY14	6/21/2022	Fecal Coliform	210	CFU/100 ml	Watch
No	MY14	7/22/2021	Total Phosphorus	1.3	mg/L	Action
No	MY14	10/21/2021	Total Phosphorus	2.05	mg/L	Action
No	MY14	11/18/2021	Total Phosphorus	1.38	mg/L	Action
No	MY14	2/15/2022	Total Phosphorus	0.185	mg/L	Action
No	MY14	3/15/2022	Total Phosphorus	0.162	mg/L	Action
No	MY14	3/15/2022	Turbidity	34	NTU	Watch
No	MY1B	7/22/2021	Fecal Coliform	2900	CFU/100 ml	Action
No	MY1B	10/21/2021	Fecal Coliform	230	CFU/100 ml	Watch
No	MY1B	11/18/2021	Fecal Coliform	210	CFU/100 ml	Watch
No	MY1B	6/21/2022	Fecal Coliform	740	CFU/100 ml	Watch
No	MY8	7/22/2021	Fecal Coliform	400	CFU/100 ml	Watch
No	MY8	2/15/2022	Fecal Coliform	610	CFU/100 ml	Watch
No	MY8	3/15/2022	Fecal Coliform	565	CFU/100 ml	Watch
No	MY8	6/21/2022	Fecal Coliform	330	CFU/100 ml	Watch
No	MY8	3/15/2022	Turbidity	33	NTU	Watch
No	MY9	7/22/2021	Fecal Coliform	690	CFU/100 ml	Watch
No	MY9	7/22/2021	Fecal Coliform	440	CFU/100 ml	Watch
No	MY9	10/21/2021	Fecal Coliform	250	CFU/100 ml	Watch
No	MY9	11/18/2021	Fecal Coliform	250	CFU/100 ml	Watch
No	MY9	2/15/2022	Fecal Coliform	235	CFU/100 ml	Watch

Storm Impacted?	Site Name	Date Collected	Analyte	Result	Unit	Flag
No	MY9	3/15/2022	Fecal Coliform	300	CFU/100 ml	Watch
No	MY9	6/21/2022	Fecal Coliform	560	CFU/100 ml	Watch

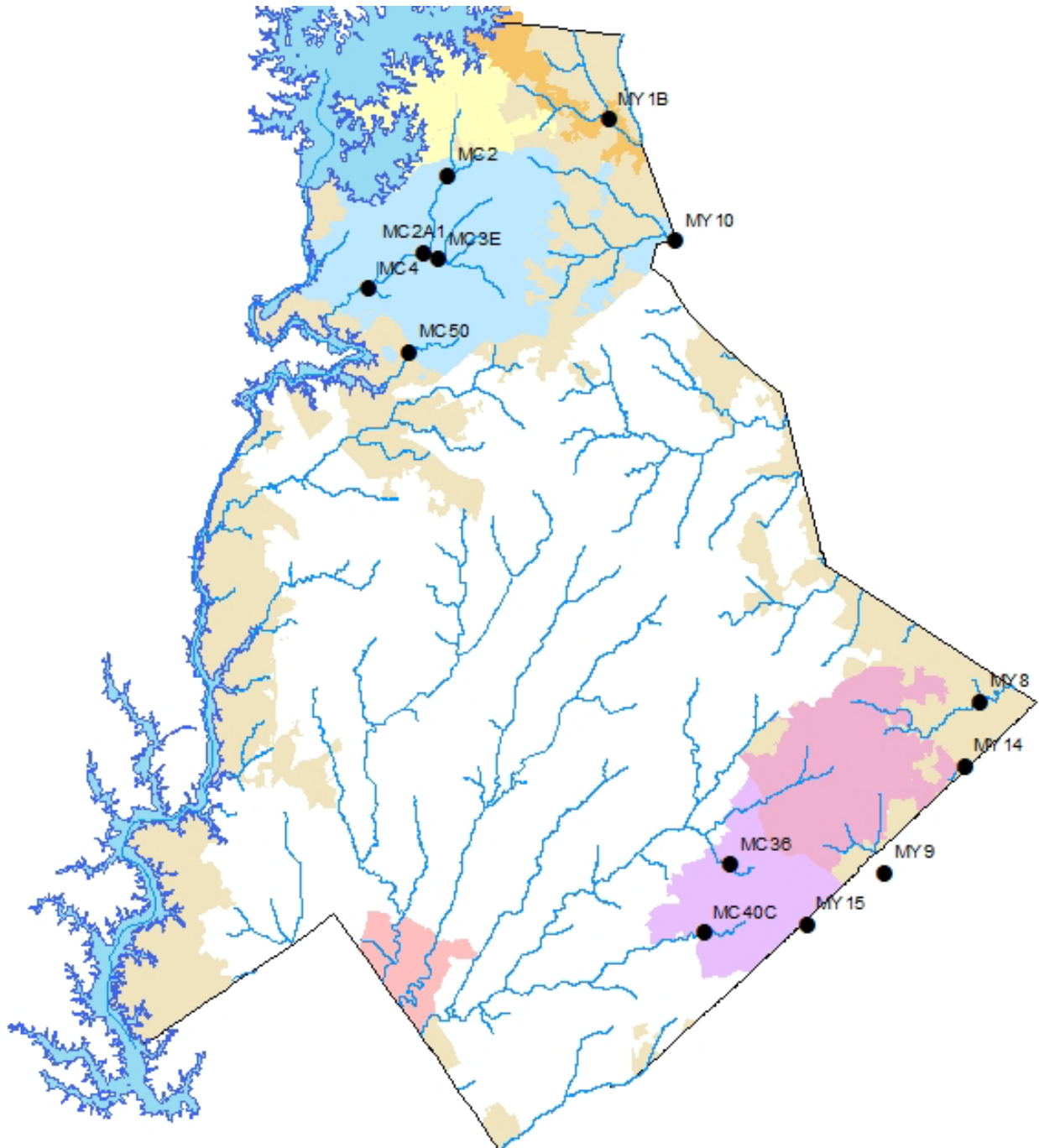


Figure 4: Mecklenburg County Phase II Stream Monitoring Sites

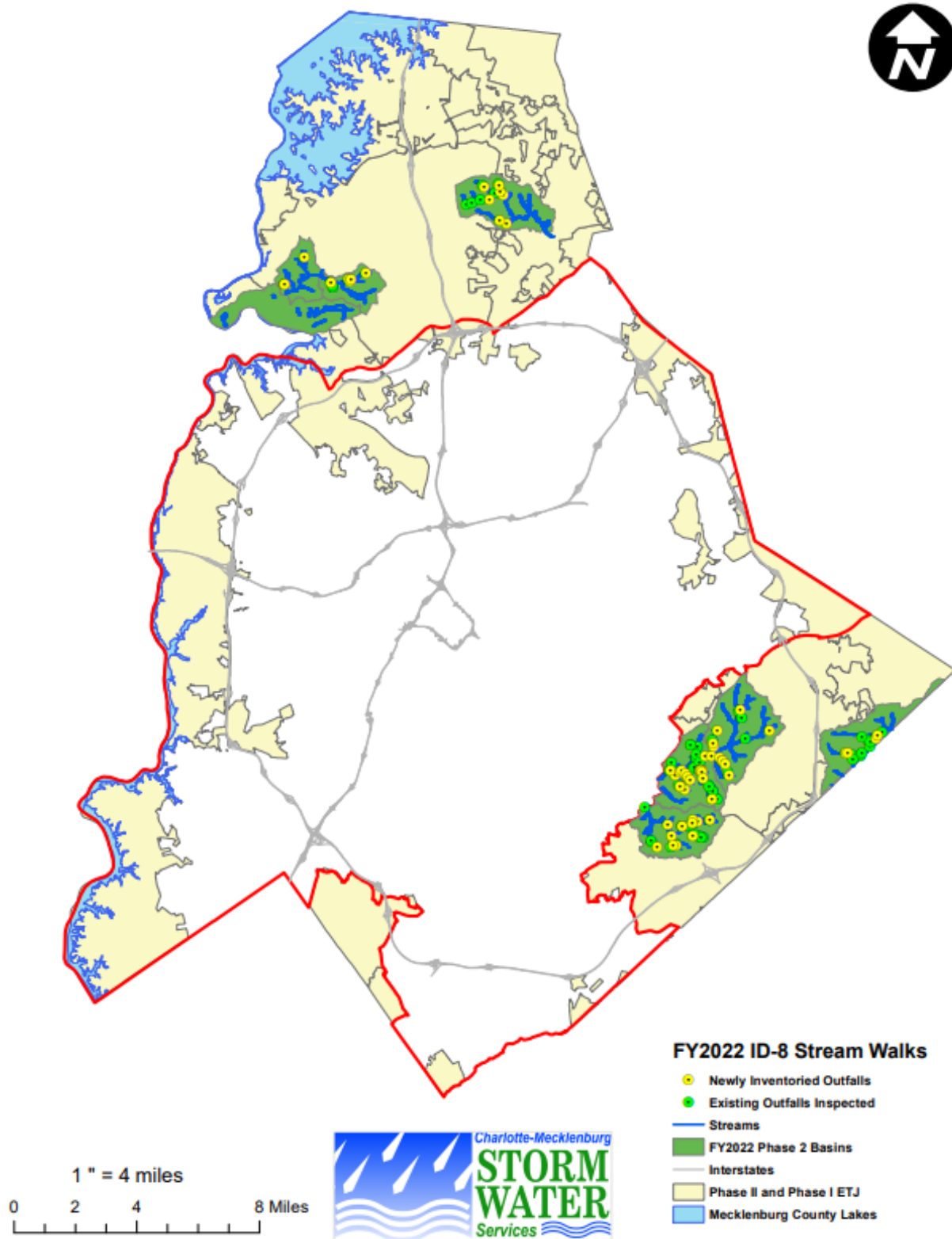


Figure 5: Stream Walk/Outfall Inspection-Inventory



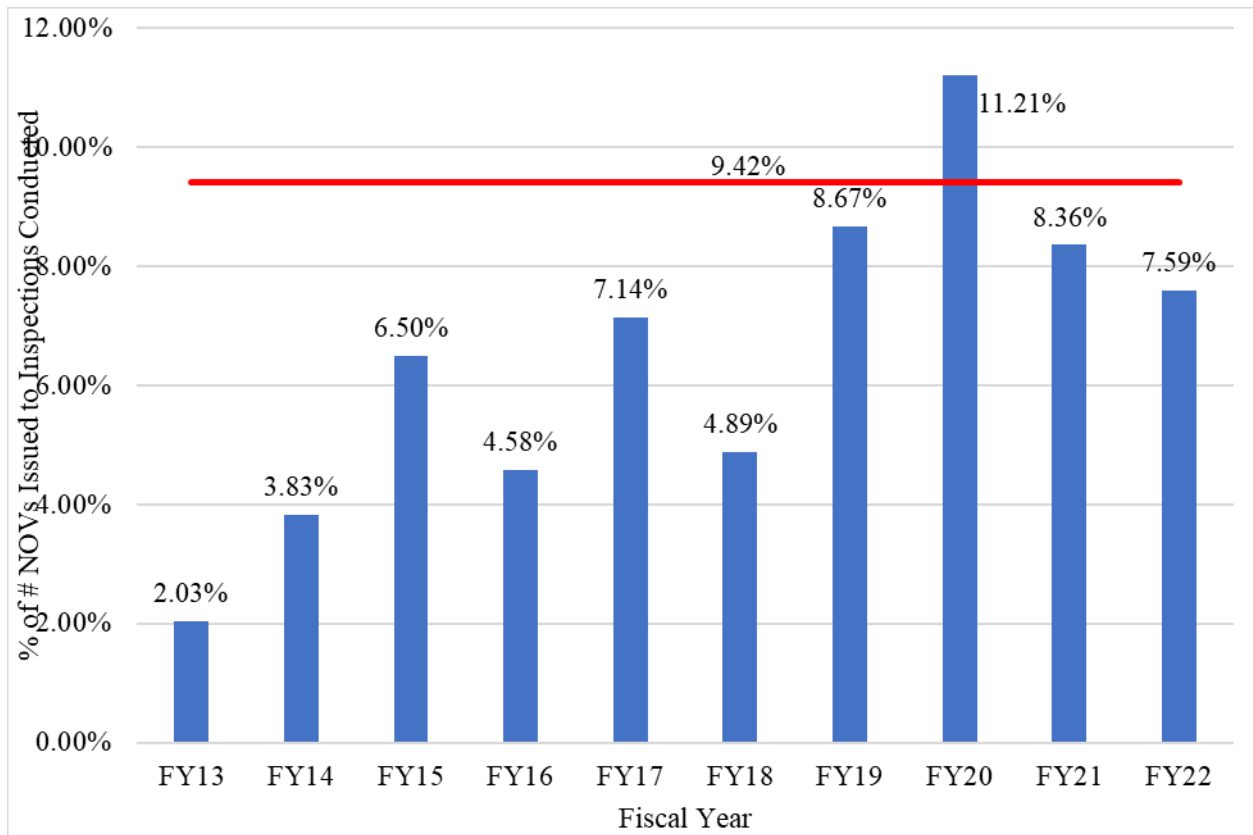


Figure 6: Ratio of the Number of NOV's Issued to Number of IDDE Inspections  
(Success = Increase in Average Percentage from Past 3 Years at 9.42%)

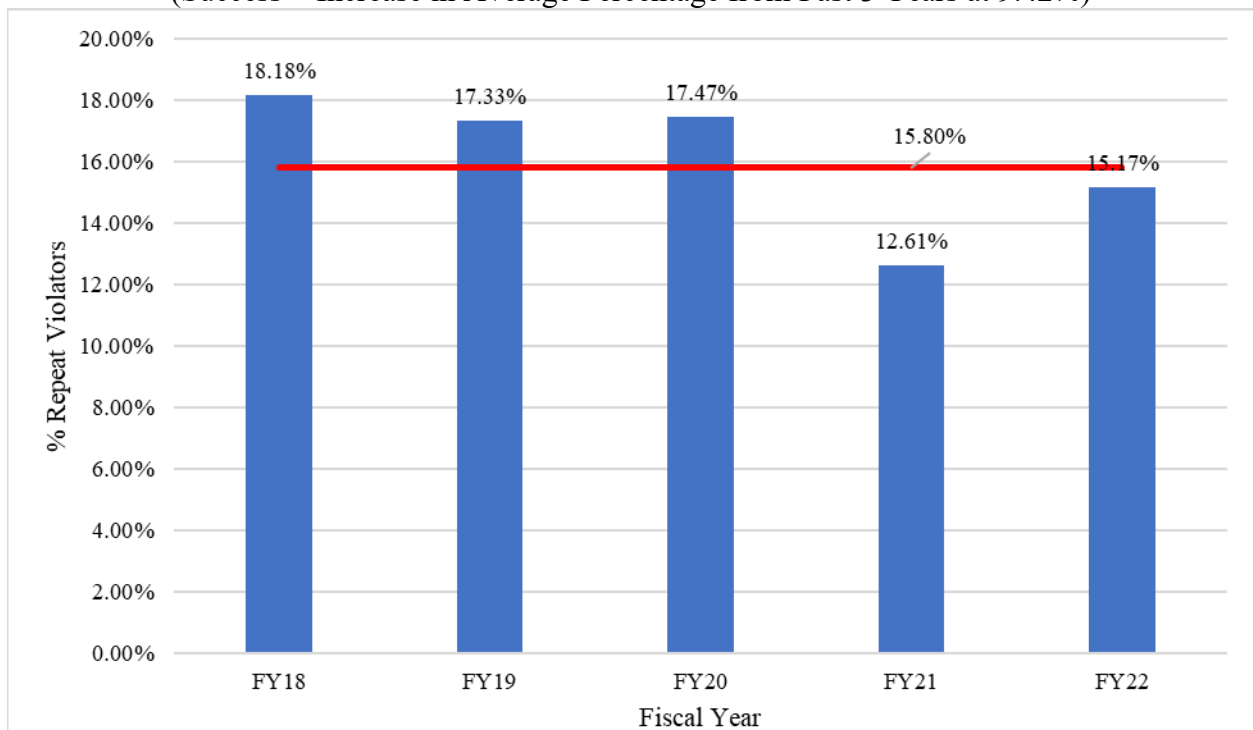


Figure 7: Percentage of Repeat Violations  
(Success = Decrease in Average Percentage for Past 3 Years at 15.80)

## 6.2 Status of Improvements Identified for Implementation in FY2022

Table 13 provides the status of improvements in the IDDE Program that were identified in FY2021 for implementation in FY2022.

Table 13: Status of Improvements Identified for Implementation in FY2022

#	Improvements Identified for Implementation in FY22	Desired Result	Program Element	Responsible Staff	Implementation Status
1	Install cameras at 2, Phase 2 CMANN sites.	Help confirm possible pollution issues detected by the CMANN equipment.	ID-4.10(c)	Iva Barnes	Completed. CMANN cameras were installed at MC4 (McDowell Creek) and MC67 (Lake Wylie cove).
2	Begin enforcement of PAH limitations.	Reduce the use of parking lot sealants containing > 0.1% PAHs, by weight.	ID-6(d)	All field staff	Completed. Enforcement of PAH limitations began in June of 2022. All staff were trained on the new enforcement criteria on July 5, 2022.
3	Reinspect facilities that have been issued a penalty within the last 3 fiscal years.	Ensure continued compliance with local ordinances.	ID-9(g)	John Thao	Completed. The IDEP program completed the reinspection of locations that have received penalties in the last 3 years. 11 inspections were completed in FY22.
4	Develop the capability to create outfall inspections in Cityworks for all stream walk outfall inspections.	Ensure we have a historic record of all outfall inspections.	ID-8(f)	Silvio Conte & Hannah Meeler	Completed. CMSWS staff worked with GIS staff to make this new capability possible. The EDMS software was used to retrieve outfall inspections from the geodatabase, edit if needed, and submit to Cityworks for individual outfall inspections to be created. 208 outfall inspections were created in Cityworks as part of the streamwalk program in FY22.
5	Use water quality modeling to identify problem areas for monitoring and follow up.	Identify and eliminate pollution sources.	ID-4.7-CO(f)	Robert Sowah	In-Progress. Data analysis has been initiated. Additional work will be completed in FY2023.

### 6.3 Improvements Identified for Implementation in FY2023

Table 14 below provides the improvements in the IDDE Program that have been identified for implementation in FY2023.

Table 14: Improvements Identified for Implementation in FY2023

#	Improvements Identified for Implementation in FY23	Desired Result	Program Element	Responsible Staff
1	Install cameras at all of the Phase 2 CMANN sites.	Help confirm possible pollution issues detected by the CMANN equipment.	ID-4.10(c)	Iva Barnes
2	Use water quality modeling to identify problem areas for monitoring and follow up.	Identify and eliminate pollution sources.	ID-4.7-CO(f)	Robert Sowah
3	Review and update the CMANN fecal prediction model.	Identify and eliminate pollution sources.	ID-4.7-CO(c)	Robert Sowah
4	Update stormwater inventory attribute information for inventory collected by GIS staff.	Ensure we have accurate inventory data.	ID-1(c)	Ryan Spidel

## Section 7: Construction Site Storm Water Runoff Control Program

Construction Site Runoff Control Programs have been developed and are currently being implemented for addressing the discharge of sediment and other pollutants from construction sites in Mecklenburg County's Phase II jurisdictions that disturb 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. These are delegated programs under NCGS 113A-60. CMSWS's Permitting and Compliance Program administers the program for the County and Towns of Davidson, Cornelius, Matthews, Mint Hill, and Pineville. In November 2019, the Town of Huntersville received delegated authority from the State to administer a local erosion control program in their jurisdiction. The Town of Huntersville coordinates with the County in the completion of the activities associated with the Construction Site Erosion Control Program described in this Section. Kevin Fox, Public Works Director, serves as the responsible party for compliance with the Permit requirements for the Construction Site Storm Water Runoff Control Program in the Town of Huntersville. His contact information is as follows: 704-766-2220 and [kfox@huntersville.org](mailto:kfox@huntersville.org).

### 7.1 Implementation Status for FY2022

Table 15 describes the BMPs identified in the Storm Water Plan for the Construction Site Storm Water Runoff Control Program and the specific actions completed between July 1, 2021 and June 30, 2022 (FY2022) for implementation of these BMPs as well as whether the measurable goals for the BMPs specified in the plan have been fulfilled.

Table 15: BMP Summary Table for the Construction Site Storm Water Control Program

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
29	Enforce Erosion Control Ordinances (CS-1)	<p>During FY2022, a total of 215 new projects were approved in Mecklenburg County with a total of 1,656.54 acres disturbed. 1,549 inspections were performed with 17 Notice of Violations (NOV's) issued and three (3) stop work orders/permit holds issued (Huntersville). Four (4) penalties were assessed for a total of \$14,000.00. \$14,000.00 in penalties have been collected. There are \$0 in penalties outstanding and \$0 in penalties have been submitted to the state for remission. Provided below are the totals for the Phase II jurisdictions.</p> <ul style="list-style-type: none"> <li>• Cornelius: 104 inspections, 2 NOV issued</li> <li>• Davidson: 49 inspections, 2 NOV issued</li> <li>• Huntersville: 811 inspections, 7 NOVs issued</li> <li>• Matthews: 166 inspections. 2 NOVs issued</li> <li>• Mint Hill: 296 inspections, 2 NOVs issued</li> <li>• Pineville: 89 inspections, 2 NOVs issued</li> <li>• Mecklenburg County: 34 inspections, 0 NOV's were issued</li> </ul>	X	
30	Erosion Control Education (CS-2)	312 people certified for CMCSI during FY2021. Classes were only offered virtually due to COVID restrictions. In person classes are to resume in FY2023. Handouts were created for erosion control pre-construction meetings in Huntersville that included checklists/common mistakes for contractors to reference in order to ensure erosion measures are being installed per plan/standards.	X	
31	Evaluate	During FY2022, an evaluation was completed of the effectiveness of the	X	

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
	Effectiveness of Erosion Control Program (CS-3)	<p>BMPs for the Construction Site Storm Water Control Program as described in the latest version of the Storm Water Plan. The evaluation revealed that the Program is successful at addressing the discharges of sediment and other pollutants from construction sites in Phase II jurisdictions. Four (4) improvements are recommended for implementation in FY2023 based on this evaluation as described in Section 6.3 below. The status of the two (2) measures of success is provided below.</p> <ul style="list-style-type: none"> <li><u>Documentation of storm water program activities</u> - In FY2022, all documentation was successfully completed.</li> <li><u>Decrease in the ratio of the number of regulatory violations compared to the number of inspections</u> - Data reveals that the ratio of the number of violations to the number of inspections has decreased slightly (see Figure 8). The desired trend is a reduction of this ratio, which would indicate fewer violations being detected, as a result of better compliance from the development community.</li> </ul>		

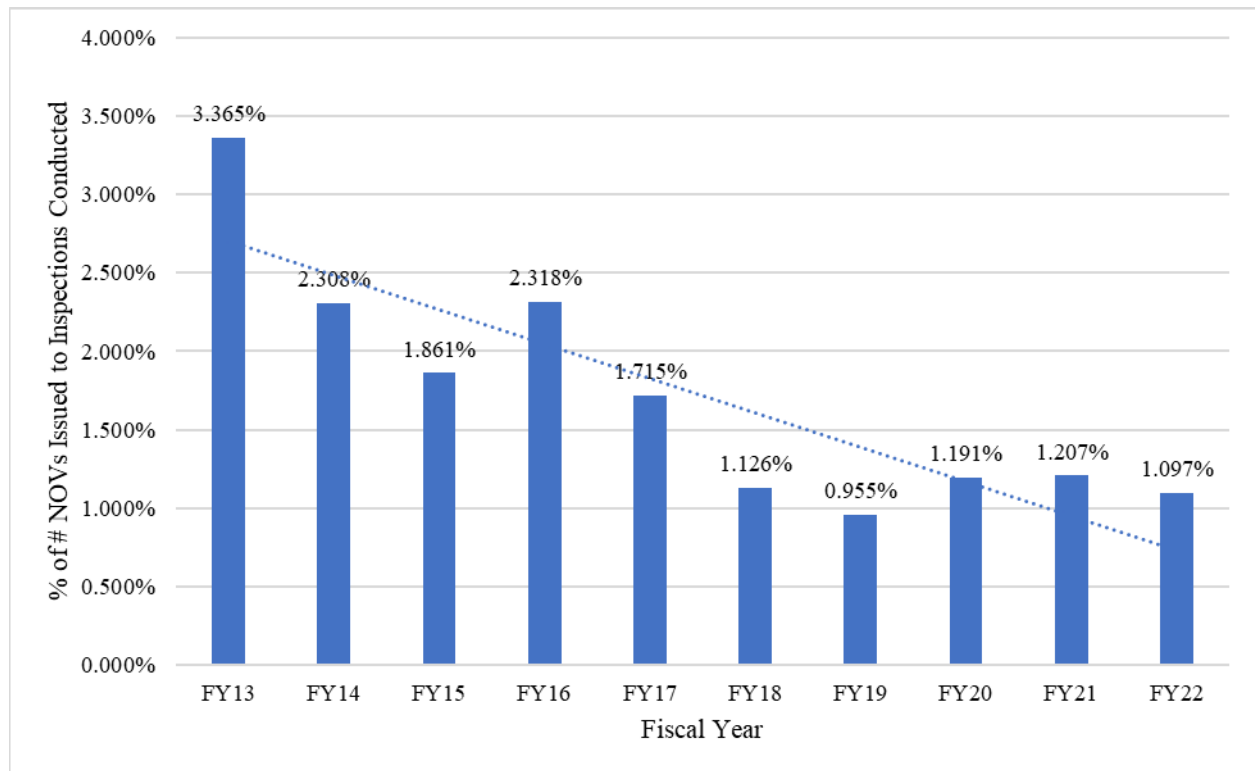


Figure 8: Ratio of Number of NOV's Issued to Erosion Control Inspections Conducted (Success = Decreasing Ratio Indicating Improved Compliance)

## 7.2 Status of Improvements Identified for Implementation in FY2022

Table 16 provides the status of improvements in the Construction Site Storm Water Runoff Control Program that were identified in FY2021 for implementation in FY2022.

Table 16: Status of Improvements Identified for Implementation in FY2022

#	Improvements Identified for Implementation in FY19	Desired Result	Program Element	Responsible Staff	Implementation Status
1	Mecklenburg County - Evaluate the usage of drones for site inspections.	Improve Compliance	CS-1	Corey Priddy	County looking into liability concerns, Water Quality is taking the lead (Alex Hattaway)
2	Mecklenburg County - Examine the NOV/Penalty process and try to find any steps that can be streamlined.	Improve Compliance	CS-1	Corey Priddy	Developing a preselected dropdown fillable .pdf to speed up the process. Not completed.
3	Mecklenburg County - Examine the ability to catalog citizen request for inspections.	Improve responses to Service Requests	CS-1	Corey Priddy	Developed a spreadsheet to catalog customer complaints.
4	Mecklenburg County - Continue working on changing all Erosion Control ordinances to meet the new State model ordinance.	Comply with State Requirements	CS-1	Corey Priddy	In draft form, awaiting approval. Will take longer due to possible changes in the Enhanced Measures.
5	Town of Huntersville - Update the Town's Sediment and Erosion Control Ordinance to include new State legislation.	Comply with State Requirements	N/A	Kevin Fox	Updated September 2021. Additional update is in progress, planned for August 2022.
6	Town of Huntersville - Create and online inspection request form for homebuilders to use for lot erosion inspections in order to effectively communicate and increase efficiency.	Improve Compliance	N/A	Kevin Fox	Completed.

### 7.3 Improvements Identified for Implementation in FY2023

Table 17 below describes improvements in the Construction Site Storm Water Runoff Control Program that have been identified for implementation in FY2023.

Table 17: Improvements Identified for Implementation in FY2023

#	Improvements Identified for Implementation in FY23	Desired Result	Program Element	Responsible Staff
1	Complete #1 from last fiscal year: Evaluate the usage of drones for site inspections.	Improve inspection effectiveness.	N/A	Corey Priddy
2	Complete #4 from last fiscal year: Approval of changes in the Erosion Control Ordinance and updates to the Enhanced Measures.	Reduce offsite sediment.	N/A	Corey Priddy
3	Develop a plan for cross-training with the City of Charlotte and the Town of Huntersville.	Improve inspection effectiveness.	N/A	Corey Priddy



#	Improvements Identified for Implementation in FY23	Desired Result	Program Element	Responsible Staff
4	Look into creating interactive hands-on training components to CMCSI. Will need to have buy in from the City of Charlotte and the Town of Huntersville.	Improve training.	N/A	Corey Priddy

## Section 8: Post-Construction Site Runoff Control Program

A Post-Construction Site Runoff Control Program has been developed and is currently being implemented for addressing post-construction stormwater runoff from new development and redevelopment projects in Mecklenburg County's Phase II jurisdictions. The program is administered by CMSWS's Water Quality and Permitting and Compliance Programs except for in the Town of Huntersville and its ETJ where effective July 1, 2020 Town staff are responsible for plan reviews and issuing land development Permits as well as conducting inspections to confirm project completion in compliance with Permit requirements.

### 8.1 Implementation Status for FY2022

Table 18 describes the BMPs identified in the Storm Water Plan for the Post-Construction Site Runoff Control Program and the specific actions completed between July 1, 2021 and June 30, 2022 (FY2022) for implementation of these BMPs as well as whether the measurable goals for the BMPs specified in the plan have been fulfilled.

Table 18: BMP Summary Table for the Post-Construction Site Runoff Control Program

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
32	Implement Post-Const. Storm Water Ordinances (PC-1)	During FY2022, a total of 215 new projects were approved in Mecklenburg County with a total of 1,656.54 acres disturbed. As of June 30, 2022, a total of 1,365 BMPs existed in the Phase II jurisdictions. Table 19 provides the number by type of BMP in each of the Phase II jurisdictions.	X	
33	Post-Construction Ordinance Inspections (PC-2)	During FY2022, 763 inspections were conducted, including 56 in Cornelius, 46 in Davidson, 401 in Huntersville, 45 in Matthews, 36 in Mint Hill, 15 in Pineville, 145 for CMS and 19 for CPCC. Six (6) NOV's were issued with all being brought into compliance, including 2 in Matthews, 2 in Mint Hill, and 2 in Pineville. During FY2022, a total of 260 deficiencies were detected with 22 being corrected. See Table 20 for a more detailed description of the inspections.	X	
34	Post-Construction Ordinance Education (PC-3)	A post-construction ordinance workshop was held virtually on December 7, 2021 from 9:00 a.m. to 12:00 pm. The workshop was conducted by the Regional Stormwater Partnership and included presentations by CMSWS. There were 369 attendees from multiple jurisdictions that participated in the workshop. In addition, .25 new BMP Projects came on-line this year and owners/operators were provided educational material via email.	X	
35	Evaluate Effectiveness of Post-Construction Control Program (PC-5)	<p>During FY2022, an evaluation was completed of the effectiveness of the BMPs for the Post-Construction Site Runoff Control Program as described in the latest version of the Storm Water Plan. The evaluation revealed that the Program is successful at addressing the discharges of pollutants from post-construction sites in Phase II jurisdictions. The status of the two (2) measures of success for the program is provided below.</p> <ul style="list-style-type: none"> <li><u>Documentation of storm water program activities</u> – In FY2022, all documentation was successfully completed.</li> <li><u>Improving Compliance</u> – Data reveals that the ratio of the number of deficiencies detected (260) to the number of inspections conducted (763) has decreased to 34.08% for FY2022 (see Figure 9), indicating continued success at improving compliance.</li> </ul> <p>More attention is being given to 3<sup>rd</sup> party inspections as resources are limited in performing inspections of all BMPs every year. In 2021, 63 NOV's were issued,</p>	X	

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		and 208 3 <sup>rd</sup> party inspections were submitted. Most were as a result of the NOV's. In 2022, 6 NOV's were issued, and 219 3 <sup>rd</sup> party inspections were submitted. This shows that the 3 <sup>rd</sup> party inspections are beginning to be submitted without having to issue a NOV. The owners of the BMPs are getting more involved in looking after and maintaining their BMPs, showing that the program is working. It will have to continually be re-evaluated as the number of BMPs increases to see if additional resources are needed to maintain an effective program.		

Table 19: BMP Numbers by Type and Jurisdiction

Jurisdiction	Bioretention	Buffer	Dry Pond	Enhanced Grass Swale	Filter Strip	Grassed Channel	Infiltration Trench	Level Spreader	Open Space	Permeable Pavement	Sand Filter	Stream Restoration	Underground Detention	Underground Sand Filter	Wet Pond	Wetland	Grand Total
CMS	61	2	98	2		5			7		18		4		20	3	220
Cornelius	25		11		6						12	1	3		22	7	87
CPCC	6		4			1			3		3		2		5		24
Davidson	28		4		2						1			3	4	5	47
Huntersville	267		120	30		18	10	2		2	100	6	15	4	46	11	631
Matthews	3		39						3		24		8		10		87
Mecklenburg	29	3	27	1	7	12			1		4				41	8	133
Mint Hill	19		39	1					3		13		1		3		79
Pineville	5		28						2		12		3		6	1	57
<b>TOTALS</b>	<b>443</b>	<b>5</b>	<b>370</b>	<b>34</b>	<b>15</b>	<b>36</b>	<b>10</b>	<b>2</b>	<b>19</b>	<b>2</b>	<b>187</b>	<b>7</b>	<b>36</b>	<b>7</b>	<b>157</b>	<b>35</b>	<b>1,365</b>

Table 20: Summary of BMP Inspections

Jurisdiction	# Inspections/ Follow Up Insp.	Non-Compliant BMPs	# BMPs brought into compliance	Notice of Maintenance	# Correction Action Requests Issued	# Notices of Violation Issued
Cornelius	56/0	5	0	1	0	0
Davidson	46/1	3	1	7	0	0
Huntersville	401/13	97	14	70	0	0
Matthews	45/5	15	2	27	1	2
Mint Hill	36/2	6	2	16	2	2
Pineville	15/2	2	2	6	1	2
CMS	145/1	120	1	3	108	0
CPCC	19/0	12	0	11	0	0
<b>TOTALS</b>	<b>763/24</b>	<b>260</b>	<b>22</b>	<b>141</b>	<b>112</b>	<b>6</b>

Table 21: Summary of BMP Education

Jurisdiction	Number of educational materials/ flash drives given to BMP Owners
Charlotte (CPCC)	0
Cornelius	3
Davidson	0
Huntersville	13
Matthews	2
Mint Hill	3
Pineville	4
<b>TOTALS</b>	<b>25</b>

Table 22: BMP Inspections Revealing Problems from 2007 through 2022

Fiscal Year	# BMPs	# Inspections Conducted	# BMPs with Problems	% BMPs with Problems
2010	355	510	206	58%
2011	418	-	238	57%
2012	497	443	256	58%
2013	630	453	248	55%
2014	664	668	244	36%
2015	713	555	286	51%
2016	926	691	247	36%
2017	1,020	640	408	64%
2018	1,032	610	496	81%
2019	*800	596	409	69%
2020	*789	709	322	45%
2021	*853	695	387	56%
2022	*929	763	260	34%

\*Number is the total number of BMP's located within the Phase 2 jurisdiction, CMS and CPCC that are regulated by Watershed, Post Construction and/or LID. The number is only for Fiscal Years 2019 and beyond.

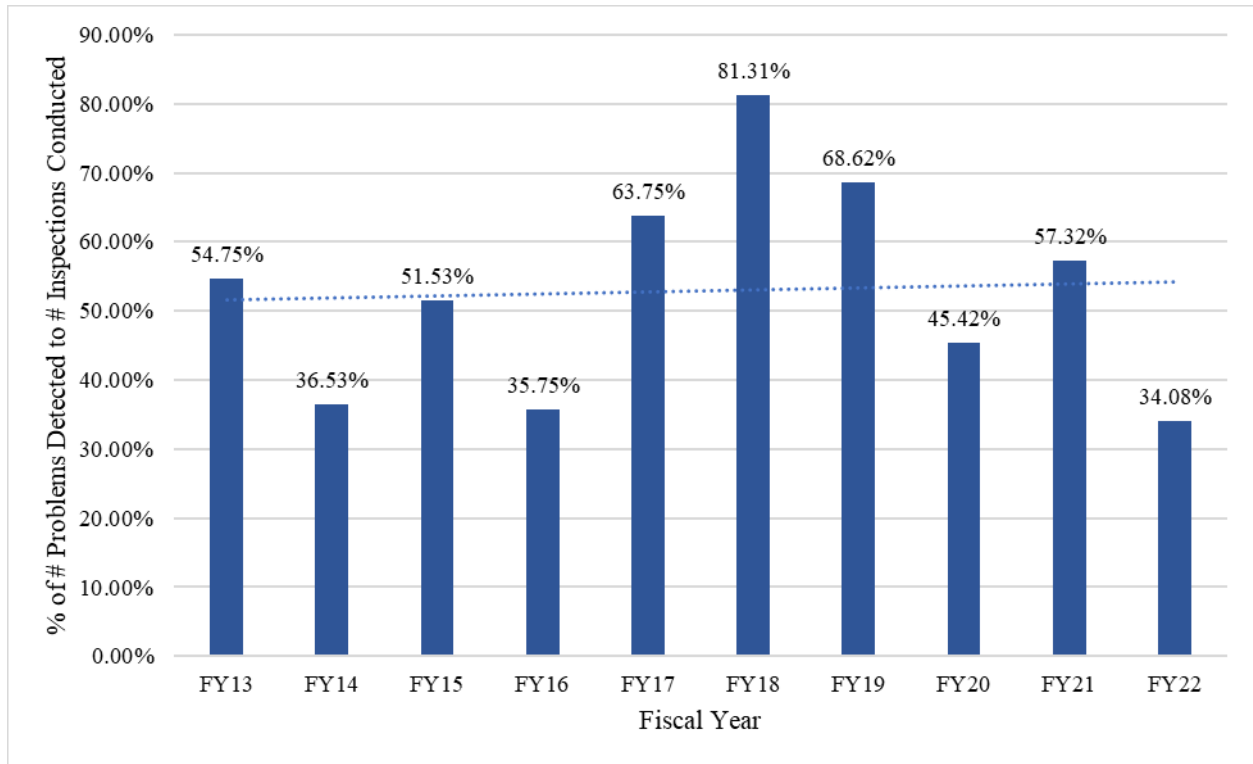


Figure 9: Ratio of Number of Deficiencies Detected to BMP Inspections Conducted  
(Success = Decreasing Ratio Indicating Improved Compliance)

## 8.2 Status of Improvements Identified for Implementation in FY2022

Table 23 provides the status of improvements in the Post-Construction Site Runoff Control Program that were identified in FY2021 for implementation in FY2022.

Table 23: Status of Improvements Identified for Implementation in FY2022

#	Improvements Identified for Implementation in FY19	Desired Result	Program Element	Responsible Staff	Implementation Status
1	Complete #3 from last year. "Develop a process to better identify when BMPs need to be inspected based on the Ordinance for which they were installed."	Improve Compliance	N/A	Corey Priddy	A detailed spreadsheet has been created. This spreadsheet lists every BMP by Jurisdiction and Ordinance. It also gives the next fiscal year that the BMP will have to be inspected, with all BMPs to be inspected once every three (3) years.
2	Work with staff on making sure educational materials are given out to new owners of BMPs as restrictions are now easing from the pandemic. Determine if Huntersville or Mecklenburg County will give out this	Increase Awareness of Requirements	N/A	Corey Priddy	The Town of Huntersville will give out educational material for BMPs in Huntersville. More of an emphasis was placed on

#	Improvements Identified for Implementation in FY19	Desired Result	Program Element	Responsible Staff	Implementation Status
	information in Huntersville.				educational materials being given out this fiscal year. As a result, there was an increase in educational material for new BMPs. The number given out rose from 9 to 25.
3	Continue issuing NOV's for sites where 3 <sup>rd</sup> party inspections are not being performed and follow-up to ensure compliance.	Improve Compliance	N/A	Corey Priddy	This year 6 NOV's were issued for non-compliance of submitting 3 <sup>rd</sup> party inspection reports. A total of 218 3 <sup>rd</sup> party reports were submitted this year. This is an increase in 3 <sup>rd</sup> party reports with a decrease in NOV's. The NOV's are working to help gain compliance with the 3rd party inspection requirement.

### 8.3 Improvements Identified for Implementation in FY2023

Table 24 below describes the improvements in the Post-Construction Site Runoff Control Program that have been identified for implementation in FY2023.

Table 24: Improvements Identified for Implementation in FY2023

#	Improvements Identified for Implementation in FY23	Desired Result	Program Element	Responsible Staff
1	Continue # 3 from last fiscal year, and work with field staff to check for 3 <sup>rd</sup> party inspections and issue NOV's if they are not being submitted.	Improve inspection effectiveness.	N/A	Corey Priddy
2	Work with the Towns to determine if Watershed Ordinances can be changed so that the BMPs would only have to be inspected every 3 to 5 years. (Water Quality would work on this task with help from Permitting and Compliance).	Improve inspection effectiveness.	N/A	Corey Priddy
3	Determine if an Environmental Specialist III, or similar position, is needed to manage the BMP inspection program. Currently, the program takes a	Improve inspection effectiveness.	N/A	Corey Priddy



#	Improvements Identified for Implementation in FY23	Desired Result	Program Element	Responsible Staff
	significant amount of time for the Environmental Supervisor to perform, taking time away from other needed job duties. Since the number of BMPs increases every year, resource allocation needs to be periodically examined.			

## Section 9: Pollution Prevention/Good Housekeeping for Municipal Operations

CMSWS has developed and implemented a Pollution Prevention/Good Housekeeping Program for municipal facilities and operations. The goal of the Pollution Prevention/Good Housekeeping Program is to reduce pollutants in storm water runoff from municipal operations.

### 9.1 Implementation Status for FY2022

Table 25 describes the BMPs identified in the Storm Water Plan for the Pollution Prevention/Good Housekeeping Program and the specific actions completed between July 1, 2021 and June 30, 2022 (FY2022) for implementation of these BMPs as well as whether the measurable goals for the BMPs specified in the plan have been fulfilled.

Table 25: BMP Summary Table for the Pollution Prevention/Good Housekeeping Program

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
36	Employee Training (PP-1)	The purpose of the Pollution Prevention and Good Housekeeping training is to inform municipal operations' staff of techniques for identifying, eliminating, or reducing pollution sources at their facilities and around the community. Pollution prevention and good housekeeping training materials were developed using an executable program (Articulate) that allows educational administrators to combine PowerPoint slides and pollution prevention video clips. Trainings are designed to be administered in small group settings that provide the opportunity to facilitate discussions on pollution issues at each facility. All trainings also include the review of individual Storm Water Pollution Prevention Plans (SWPPPs), Spill Response and Clean-up Plans, and review of storm drainage systems. Videos produced by Excal Visual were included in the module and focused on work at different types of facilities (fleet maintenance, land disturbance, parks and recreation, solid waste, streets and drainage, and general municipal jobs). The video identifies activities at these facilities that can negatively impact surface water and demonstrates suggested prevention techniques. At the end of the training the participants review the information during a question-and-answer session. During FY2022, a total of 348 municipal operations' staff from the Phase II jurisdictions completed the training program. For the Towns, facility managers provided the training to their staff using materials provided by CMSWS. CMSWS staff trained CMS and CPCC personnel in person. CMS personnel received in-person training on June 28 and 29, 2022 at Olympic High School. CPCC personnel received in-person training on April 11, 2022 at the CPCC Central Campus. Table 26 below indicates the number of employees that completed the training by Phase II jurisdiction/entity in FY2022.		
37	Inspections (PP-2)	Municipal inspection forms and procedures, including the Phase II permit requirements, operation and maintenance (O&M) plans, and standard operating procedures (SOPs), were reviewed on July 1, 2021, and no significant changes or updates were made. In October 2021, the inspection form was updated to reflect new Stormwater Pollution Prevention Plan (SWPPP) requirements in the updated NPDES permits, including an increased frequency from semi-annually to quarterly for facility stormwater inspections, qualitative monitoring, and analytical monitoring as well as the addition of solvent management plans. On October 18, 2021, five (5) CMSWS staff received training on Phase II municipal inspections. Training included a review of inspection processes, reports, and deadlines. Based on		

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		<p>findings from FY2021 and previous years, common problems were identified, and inspectors were instructed to provide guidance to facility managers for resolving them. As part of the facility inspection process, emphasis was placed on updating SWPPPs, filling out spill logs, reviewing spill response plans, verifying that all pesticide applicator training and license(s) were up to date using the N.C. Department of Agriculture and Consumer Services website, and assessing the measures that are implemented to prevent or minimize stormwater runoff from areas used for vehicle and equipment cleaning. Some of the measures include using a wash bay that drains into an oil/water separator, washing vehicles at permitted car wash facilities, or using a wash area that is not directly connected to a storm drain system, such as grassed areas, gravel parking areas, or structural stormwater control measures (SCMs). During FY2022, CMSWS staff inspected 52 municipal facilities as follows:</p> <ul style="list-style-type: none"> <li>• Mecklenburg County = 12</li> <li>• Towns (one for each Town) = 6</li> <li>• Central Piedmont Community College (CPCC) = 4</li> <li>• Charlotte Mecklenburg Schools (CMS) = 30</li> </ul> <p>Based on inspection findings in recent years, several areas for improvement were emphasized during the FY2022 inspections, including proper cleanup of petroleum spills, waste container storage and maintenance, record keeping for compliance with the Phase II Stormwater Permit, and SWPPP implementation. Two (2) problems were observed at County and Town municipal facilities, which is a decrease from five (5) problems observed in FY2021. The two (2) problems were for failure to comply with the SWPPP. One (1) of the problems was for failure to conduct semi-annual inspections, and the other one (1) problem was for failure to update the site map. Latta and McDowell Nature Preserves were removed from the annual inspection list after it was determined that they do not have a significant potential to pollute. The SWPPPs were reviewed and updated by CMSWS staff to reflect any changes in the previous year, and updated copies were sent to facility managers. Solid Waste staff updated the SWPPPs for their sites. The four (4) CPCC campuses in Mecklenburg County inspected in FY2022 were Central, Cato, Harper, and Merancas (North). Areas of emphasis for inspections at CPCC facilities included SWPPP implementation, stormwater system and SCM maintenance, ensuring that waste containers are properly covered with drain plugs in place, and compliance with the Phase II Permit Requirements section. Two (2) problems were observed at the CPCC campuses, which is an increase from the zero (0) problems observed in FY2021. The two (2) problems were both for failure to update the site map in the SWPPP. The CPCC SWPPPs were updated by Zack Harris, Grounds and Site Coordinator for CPCC Facilities Services, and reviewed by CMSWS staff. Inspections were conducted at thirty (30) CMS facilities. Of these facilities, seven (7) have SWPPPs and are inspected annually. Bain Elementary School was removed from the annual inspection list after it was determined that the school does not have a significant potential to pollute. CMS facilities that do not maintain SWPPPs are inspected approximately every five (5) years. Areas of emphasis for inspections at CMS facilities included SWPPP implementation, stormwater system and SCM maintenance, ensuring that waste containers are properly covered with drain plugs in place, and compliance with the Phase II Permit Requirements section. Zero (0) problems were observed at the CMS facilities, which is decrease from the one (1) observed in FY2021. SWPPP updates at CMS facilities were</p>		

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
		completed by Jeff Mitchell, Environmental Health and Safety Manager for CMS, and reviewed by CMSWS staff. Four (4) total problems were observed in FY22. No repeat problems were observed. All four (4) of those problems described above for the County, Towns, CMS, and CPCC were for SWPPP non-compliance.		
38	Maintain and Update an Inventory of Municipal Operations (PP-5)	<p>During FY2022, CMSWS used the procedures described in the Storm Water Quality Program Plan to update the inventory of municipal operations and facilities for the purpose of ensuring the identification of all operations and facilities that have a significant potential for generating polluted storm water runoff so that plans can be developed and implemented for eliminating or reducing these pollutants to protect downstream water quality. The standard operating procedures (SOPs) were reviewed and revised to comply with the new SOP templates on December 30, 2021. The inventory update process was completed on January 20, 2022. Co-permittees from CMS, CPCC, Cornelius, Davidson, Matthews, Mint Hill, Pineville, Huntersville, and Unincorporated Mecklenburg County were notified of the changes to their municipal inventory on February 7, 2022. As a result, the following parcels were identified, but none were determined to have a significant potential to pollute and were therefore not added to the Program:</p> <ul style="list-style-type: none"> <li>• Cornelius = 2 parcels (2 vacant)</li> <li>• Davidson = 2 parcels (community center and Fisher Farm Park)</li> <li>• Huntersville = 2 parcels (2 vacant)</li> <li>• Matthews = 3 parcels (3 single family)</li> <li>• Mint Hill = 0 parcels</li> <li>• Pineville = 0 new parcels</li> <li>• Mecklenburg County = 66 parcels (11 CMS schools, 49 vacant parcels, 4 single-family residential parcels, 1 former commercial parcel where the building has now been demolished, 1 parcel - a portion of Reedy Creek Nature Preserve)</li> <li>• CPCC = 8 parcels (2 vacant, 4 current CPCC buildings, and 2 paved areas)</li> <li>• CMS = 0 parcels</li> </ul> <p>Five (5) properties were evaluated using the Facility Exposure Form. These properties were: PID 10509124, 08303114, 01742111, 01720401, 00311104. They consisted of two (2) CPCC Merancas Campus properties, Fisher Farm Park in Davidson, a commercial lot containing a section of the Southern Railway line in Mecklenburg County, and the WSOC radio transmitter tower at Reedy Creek Nature Preserve in Mecklenburg County. The properties were determined to have no significant potential to pollute stormwater.</p>		
39	Evaluate Effectiveness of Pollution Prevention/ Good Housekeeping Program (PP-9)	<p>During FY22, an evaluation was completed of the effectiveness of the Pollution Prevention and Good Housekeeping Program as described in the FY22 version of the Storm Water Plan. This evaluation revealed that the Program is performing effectively and efficiently at achieving program goals and that it meets or exceeds permit requirements. The status of the two (2) measures of success for the program is provided below.</p> <ul style="list-style-type: none"> <li>• <u>Documentation of storm water program activities</u> – In FY2022, all documentation was successfully completed, and all assigned measurable goals for the Program were satisfactorily fulfilled.</li> <li>• <u>Improving Compliance</u> – Data reveals that the ratio of the number of deficiencies detected (4) to the number of inspections conducted (52) has decreased to 7.69% for FY2022 (see Figure 10), indicating continued success at improving compliance.</li> </ul> <p>During FY22, a total of 70 “recommendations” for improvement, which do not represent deficiencies, were made as a result of inspections, which when</p>		

BMP #	BMP Description	Implementation Actions	Goal Met																					
			Yes	No																				
		<p>added to the four (4) deficiencies totals 74 findings as summarized in Table 27. During FY22, the majority of findings fell into one (1) of four (4) categories, including stormwater system and BMPs, erosion, Above Ground Storage Tanks (ASTs) and waste storage/disposal areas. In total, these categories accounted for 59 findings or 80% of total findings. As in previous years, overgrown vegetation, trash accumulation, and sedimentation were common problems associated with unmaintained BMPs. Erosion was observed at various types of facilities and was usually associated with construction activities or high-traffic pedestrian areas. Issues noted for ASTs included minor spills, undisposed absorbent and missing identification labels. Issues at waste storage/disposal areas were observed at several facilities and were usually associated with dumpster wear, such as broken/missing/open lids and corrosion. Other relatively common issues were associated with material storage areas (6 findings, or 8.1%) and spill response equipment (4 findings, or 5.4%). CMSWS inspectors recommended that all municipal facilities with the potential to pollute surface waters should maintain spill kits in the appropriate areas. During training for FY2023, emphasis will be placed on educating facility managers about preventing common problems that were observed during FY22. Areas of emphasis will include erosion control (particularly at construction sites), prompt use and disposal of absorbent materials, use and maintenance of trash dumpsters, spill prevention during fueling operations, and maintenance of structural stormwater BMPs. Photos of housekeeping issues and potential pollution sources observed during inspections will be provided for training presentations in FY23. The program evaluation also included an annual assessment of the effectiveness of the BMPs described in the Storm Water Plan that are currently in use by Mecklenburg County’s Phase II jurisdictions to reduce pollutants from municipally owned streets, roads, parking lots, catch basins, and storm water conveyance systems. This evaluation was based on FY22 data received from the co-permittees regarding costs and the estimated quantities of pollutants removed as described in the table below.</p> <table><tr><th>BMPs</th><th>Lbs. Removed</th><th>Cost</th><th>Cost/Lb.</th></tr><tr><td>Street Sweeping</td><td>1,138,276</td><td>\$535,964</td><td>\$0.47</td></tr><tr><td>Parking Lot Cleaning</td><td>76,000</td><td>\$26,372</td><td>\$0.35</td></tr><tr><td>Conveyance Systems Cleaning</td><td>695,000</td><td>\$223,980</td><td>\$0.32</td></tr><tr><td>TOTALS</td><td>1,909,276</td><td>786,316</td><td>\$0.41</td></tr></table> <p>Based on a report produced by R.C. Sutherland in 2013 entitled Clean Streets Mean Clean Streams, an acceptable pollutant removal range is \$3 to \$5 per pound. The cost ranges reported by the co-permittees were significantly less; therefore, it is determined that these BMPs are effective at removing pollutants and no changes are proposed in FY22. As part of the overall evaluation of the Pollution Prevention and Good Housekeeping Program, two (2) recommendations for improvement have been made as described in Section 8.3 below. These recommendations will be implemented in FY2022 through the execution of the Work Plan.</p>	BMPs	Lbs. Removed	Cost	Cost/Lb.	Street Sweeping	1,138,276	\$535,964	\$0.47	Parking Lot Cleaning	76,000	\$26,372	\$0.35	Conveyance Systems Cleaning	695,000	\$223,980	\$0.32	TOTALS	1,909,276	786,316	\$0.41		
BMPs	Lbs. Removed	Cost	Cost/Lb.																					
Street Sweeping	1,138,276	\$535,964	\$0.47																					
Parking Lot Cleaning	76,000	\$26,372	\$0.35																					
Conveyance Systems Cleaning	695,000	\$223,980	\$0.32																					
TOTALS	1,909,276	786,316	\$0.41																					

Table 26: Employee Training by Jurisdiction in FY2022

Facility	Jurisdiction	Training Date	# Attending
Hickory Grove Recycling	Mecklenburg Co.	5/24/2022	7

Facility	Jurisdiction	Training Date	# Attending
Compost Central	Mecklenburg Co.	5/18,25/2022	19
N Meck Recycling	Mecklenburg Co.	4/12 and 5/25/2022	7
Parks & Recreation	Mecklenburg Co.	6/2 and 8/2022	31
Storm Water Operations	Mecklenburg Co.	5/02/2022	9
Emergency Mgmt. Services	Mecklenburg Co.	4/16/2022	4
Fox Hole Landfill & Recycling	Mecklenburg Co.	4/27/2022	12
Meck. Co. White Goods & Tire	Mecklenburg Co.	5/18/2022	2
Traditional Golf Course	Mecklenburg Co.	4/25/2022	7
Cornelius Public Works	Town of Cornelius	7/15/2022	8
Davidson Public Works	Town of Davidson	5/13/2022	8
Huntersville Public Works	Town of Huntersville	5/24/2022	11
Matthews Public Works	Town of Matthews	5/12,20,23, and 28/2022	33
Mint Hill Public Works	Town of Mint Hill	7/18/2022	10
Pineville Public Works	Town of Pineville	4/19/2022	4
Charlotte Mecklenburg Schools	CMS	6/28,29/2022	133
Central Piedmont Community College	CPCC	4/11/2022	58
<b>TOTAL</b>			<b>348</b>

Table 27: Summary of Inspection Findings from FY2008 through FY2022

Inspection Findings	Number of Findings by Fiscal Year															Totals
	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	
Storm water System & BMPs <sup>1</sup>	0	0	0	0	0	17	25	14	12	21	26	25	18	17	12	<b>187</b>
Erosion	0	0	1	0	0	16	8	10	12	21	26	20	16	11	10	<b>151</b>
Illicit discharges/connections	3	5	3	0	0	3	4	6	8	3	4	7	2	0	0	<b>48</b>
Aboveground Storage Tanks <sup>2</sup>	-	-	-	-	-	-	-	-	-	5	7	3	5	12	9	<b>41</b>
Underground Storage Tanks <sup>2</sup>	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	<b>0</b>
Material Storage Area(s)	0	2	2	0	0	2	7	7	0	15	11	11	14	7	6	<b>84</b>
Processing Area(s) <sup>2</sup>	-	-	-	-	-	-	-	-	-	2	2	4	1	1	0	<b>10</b>
Loading/Unloading Area(s) <sup>2</sup>	-	-	-	-	-	-	-	-	-	8	7	3	3	2	3	<b>26</b>
Vehicle/Equipment Areas(s)	0	0	0	0	0	0	4	1	2	11	10	11	6	2	6	<b>53</b>
Oil/Water Separator / Pretreatment <sup>2</sup>	-	-	-	-	-	-	-	-	-	7	2	2	1	0	0	<b>12</b>
Waste Storage/Disposal Area(s)	1	5	5	0	0	7	8	16	26	31	26	26	26	25	18	<b>220</b>
Food Service Area(s) <sup>2</sup>	-	-	-	-	-	-	-	-	-	2	1	2	0	1	1	<b>7</b>
Floor Drains <sup>2</sup>	-	-	-	-	-	-	-	-	-	6	2	0	0	2	1	<b>11</b>
Spill Response Equipment <sup>2</sup>	-	-	-	-	-	-	-	-	-	11	15	12	10	6	4	<b>58</b>
Equipment	0	2	0	0	0	0	0	0	0	-	-	-	-	-	-	<b>2</b>



Inspection Findings	Number of Findings by Fiscal Year															Totals
	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	
Maintenance Needed <sup>3</sup>																
Inadequate Housekeeping <sup>3</sup>	2	0	2	0	0	0	0	0	0	-	-	-	-	-	-	4
Not Operating in Accordance with SWPPP	7	5	4	0	0	10	5	4	5	11	13	9	30	21	4	128
<b>Totals</b>	<b>13</b>	<b>19</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>55</b>	<b>61</b>	<b>58</b>	<b>65</b>	<b>154</b>	<b>152</b>	<b>135</b>	<b>132</b>	<b>107</b>	<b>74</b>	<b>1,042</b>
1. The Storm water System and BMPs are separated on the current inspection checklist but are combined in this table for comparison to previous years. 2. These categories were not tracked in the annual report prior to FY17. 3. Starting with FY2017, these findings are tracked under other categories (e.g., material storage areas, processing areas, etc.).																

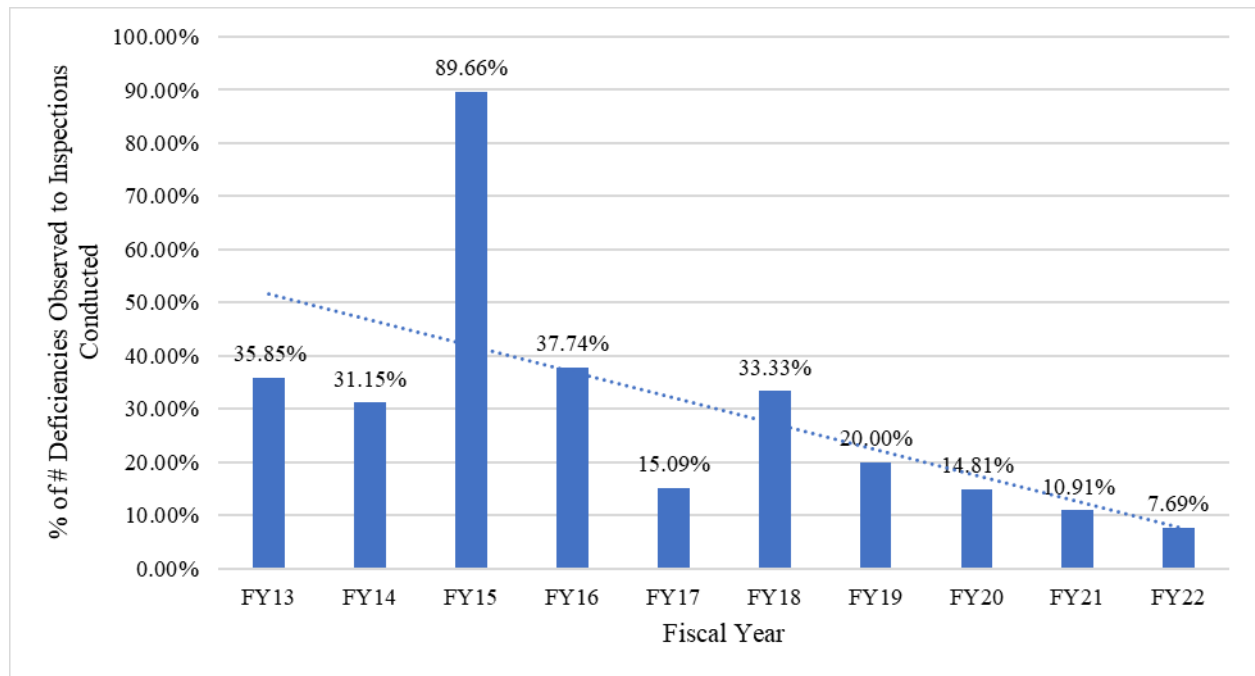


Figure 10: Ratio of Number of Deficiencies Detected to Municipal Inspections Conducted (Success = Decreasing Ratio Indicating Improved Compliance)

## 9.2 Status of Improvements Identified for Implementation in FY2022

No improvements were identified in FY2021 for implementation in FY2022.

## 9.3 Improvements Identified for Implementation in FY2023

Table 28 below describes the improvements in the Pollution Prevention and Good Housekeeping Program that have been identified for implementation in FY2023.

Table 28: Improvements Identified for Implementation in FY2023

#	Identified Improvement	Desired Result	Program Element	Responsible Staff
1	Ensure that permitted facilities are in compliance with updated NPDES permit requirements.	Ensure compliance.	PP-2	Richard Farmer

## Section 10: Total Maximum Daily Loads (TMDLs)

CMSWS has developed and implemented a program for addressing non-point source pollutant loading associated with the Total Maximum Daily Loads (TMDLs) approved by EPA for the receiving waters of the Phase II MS4 storm water discharges and/or waters downstream of these discharges. The goal of the TMDL Program is to reduce non-point source pollutant loading to the receiving stream to the maximum extent practicable.

### 10.1 Implementation Status for FY2022

Table 29 describes the BMPs identified in the Storm Water Plan for the TMDL Program and the specific actions completed between July 1, 2021 and June 30, 2022 (FY2022) for implementation of these BMPs as well as whether the measurable goals for the BMPs specified in the plan have been fulfilled.

Table 29: BMP Summary Table for the TMDL Program

BMP #	BMP Description	Implementation Actions	Goal Met	
			Yes	No
40	Evaluate Impaired Waters (IW-1)	In January 2022, the State issued its Draft 2022 303(d) list and integrated 305(b) and 303(d) reports. A review of these reports revealed that no new TMDLs have been approved in Mecklenburg County. Since no new TMDLs have been approved, no changes will be made to the existing Water Quality Recovery Programs and Strategies. Although Benthos and/or Fish Community assessments in Little Sugar Creek and Sugar Creek increased from Category 4s in 2020 to Category 5 in 2022, DWR does not consider these to be new Category 5 listings. The listings were re-classified as DWR no longer uses Category 4s listings for biological integrity parameters. No new TMDLs have been developed for Mecklenburg County since 2014.	X	
41	Water Quality Recovery Plans (IW-2)	All Water Quality Recovery Plans have been developed and implemented for those watersheds with TMDLs that are the responsibility of Mecklenburg County. These Plans are incorporated into Section 9 of the Storm Water Plan. The BMPs described in the Storm Water Plan for TMDL compliance were effectively and efficiently implemented in FY2022.	X	
42	Assess, Report and Modify WQRPs (IW-4)	An evaluation was completed of the effectiveness of the TMDL Program as described in the latest version of the Storm Water Plan. The TMDL annual assessment is included as Attachment 1 of this report. This assessment includes additional activities to be performed in FY2023 as described below. These additional activities have been incorporated into the Water Quality Recovery Plan located in Section 9 of the Storm Water Plan. They have also been incorporated into the FY2023 Work Plan for implementation.	X	

### 10.2 Status of Improvements Identified for Implementation in FY2022

Table 30 below provides the status of improvements in the TMDL Program that were identified in FY2021 for implementation in FY2022.

Table 30: Status of Improvements Identified for Implementation in FY2022

#	Improvements Identified for Implementation in FY22	Desired Result	Task Code	Deadline	Status
1	Improve data collection and reporting for compiling the annual TMDL report.	Permit Compliance	IW-4(b)	6-30-2022	Complete

#	Improvements Identified for Implementation in FY22	Desired Result	Task Code	Deadline	Status
2	Construction activities associated with the restoration of a 9,000-foot section of West Branch Rocky River are expected to be completed by May 2022. Historically, West Branch Rocky River has been severely degraded by storm water flows that erode the stream banks. The restoration project will stabilize the stream banks to reduce erosion and improve water quality.	Permit Compliance	Engineering & Mitigation Program	6-30-2022	Completed

### 10.3 Improvements Identified for Implementation in FY2023

Table 31 below describes the additional BMPs that will be implemented during FY2023 in the Rocky River and Goose Creek watersheds to reduce fecal coliform bacteria levels and enhance water quality.

Table 31: Improvements Identified for Implementation in FY2023

#	Improvements Identified for Implementation in FY23	Desired Result	Program Element	Responsible Staff
1	Routine monitoring will continue to be performed in the TMDL watersheds by CMSWS. Exceedances of established water quality watch and action levels will be identified and follow up actions conducted as necessary for the identification and elimination of pollution sources	Identify and eliminate sources of elevated fecal coliform bacteria	IW-4(g)	Tim Besier
2	By December 30, 2022, CMSWS will complete a review of Health Department records to determine where failed septic systems have been identified in both the Rocky River and Goose Creek TMDL watersheds. Follow up inspections and monitoring will be performed as necessary to ensure the elimination of sources of fecal coliform bacteria associated with failed septic systems thereby addressing impaired waters.	Identify and eliminate sources of elevated fecal coliform bacteria	IW-2(c)	John Thao
3	By March 31, 2023, major outfalls will be inspected in the Rocky River TMDL watershed. Dry weather flows will be identified and pollution sources eliminated thereby addressing impaired waters.	Identify and eliminate sources of elevated fecal coliform bacteria	IW-2(e)	John Thao
4	Construction activities associated with the restoration of an additional 5,000-foot section of West Branch Rocky River are expected to begin in late FY2023 or early FY2024. Historically, West Branch Rocky	Improve stream stability and aquatic habitat	N/A	Tim Trautman

#	Improvements Identified for Implementation in FY23	Desired Result	Program Element	Responsible Staff
	River has been severely degraded by storm water flows that erode the stream banks. The restoration project will stabilize the stream banks to reduce erosion and improve water quality.			
5	Conduct targeted surface water sampling in headwater areas of the Goose Creek watershed to further delineate sources of fecal coliform to the system.	Identify and eliminate sources of elevated fecal coliform bacteria	IW-2(m)	John Thao

## Section 11: Program Effectiveness

During FY2022, the permittee has satisfactorily implemented the BMPs and fulfilled the measurable goals specified in Storm Water Permit No. NCS000395 in accordance with the Storm Water Plan. The other provisions of the Permit have also been satisfactorily fulfilled; therefore, compliance with the Permit has been achieved. The permittee further finds that the implementation of the Storm Water Plan as well as the individual BMPs contained in the Plan has resulted in satisfactory compliance with seven (7) of the eight (8) or 87.5% of the identified measures of success as indicated in Table 32. This is the same percentage arrived at during FY2021. The implementation of the program enhancements described in Table 33 are meant to improve effectiveness at meeting these measures.

Table 32: Measures of Success in FY2022

#	Measures of Success	FY2022 Target	FY2022 Results	Target Met (Yes or No)
1	<u>Documentation</u> – Document Storm Water Program activities that demonstrate successful fulfillment of BMPs.	100% of Activities Documented	100% of Activities Documented	Yes
2	<u>Increasing Awareness</u> – Minimum of 60% of survey respondents indicating they are aware that water flowing into storm drains goes directly to creeks and lakes.	60%	81.5%	Yes
3	<u>Increasing Number of Volunteers</u> – Increase in the number of volunteers compared to the average of the previous three (3) fiscal years.	4,391	4,623	Yes
4	<u>Increasing Pollution Problems Identified</u> – Increase in the ratio of the number of Notices of Violation issued to the number of IDDE inspections conducted compared to the average of the previous three (3) fiscal years.	9.42%	7.59%	No
5	<u>Decreasing Number of Repeat Violators</u> – Decrease in the ratio of the number of repeat violators to the number of Notices of Violation (NOVs) issued compared to the average of the previous three (3) fiscal years.	15.80	15.17%	Yes
6	<u>Improving Compliance</u> – Decrease in the ratio of the number of Notices of Violation issued to the number of erosion control inspections conducted compared to the previous fiscal year.	1.207%	1.097	Yes
7	<u>Improving Compliance</u> – Decrease in the ratio of the number of noncompliant BMPs to the number of inspections conducted compared to the previous fiscal year.	57.32%	34.08%	Yes
8	<u>Improving Compliance</u> – Decrease in the ratio of the number of deficiencies observed at municipal facilities to the number of inspections conducted compared to the previous fiscal year.	10.91%	7.69%	Yes

## Section 12: Program Enhancements for FY2023

Table 33 summarizes the improvements recommended for implementation in FY2023 as identified in the previous sections. In the FY2023 annual report, the status of the implementation of these improvements will be described.

Table 33: Improvements Identified for Implementation in FY2023

#	Identified Improvement	Desired Result	Program Element	Responsible Staff
<b>Public Education &amp; Outreach</b>				
1	Redesign the current water quality school education material for younger ages to be more engaging and relevant to the school curriculum.	Improve effectiveness of school age training materials.	PE-10	Ashley Smith
2	Modify school education worksheets to include Spanish.	Improve effectiveness of school age training materials.	PE-10	Ashley Smith
3	Implement the Safe Swim Communication Campaign to provide education to lake users regarding Best Management Practices related to swimming in lakes.	Better inform swimmers of health issues related to swimming in lakes.	PE-10	Ashley Smith
4	Implement the public education components of the Underserved Communities Reach Plan.	Increase volunteer activity.	PE-10	Ashley Smith
5	Develop video to educate residents on built-upon area (BUA) requirements for protection of water quality.	Improve compliance with BUA.	PE-10	Ashley Smith
<b>Public Involvement &amp; Participation</b>				
6	Finalize the new design of the Adopt a Stream sign.	Enhance effectiveness of signage.	PI-2	Taylor Mebane
7	Implement the Public Involvement components of the Underserved Communities Reach Plan, including researching potential events in underserved communities such as stream clean ups, storm drain marking events and tree plantings.	Increase volunteer activity in underserved communities.	PE-10	Taylor Mebane
8	Expand the Adopt a Drain program into another Phase II town.	Increase volunteer activity.	SBP Involvement	Ashley Smith
9	Investigate a Plogging event for Creek Week.	Increase volunteer activity.	PE-I(16)	Taylor Mebane
10	Investigate a new public involvement competition for students.	Increase volunteer activity.	PE-10	Ashley Smith
<b>Illicit Discharge Detection &amp; Elimination</b>				
11	Install cameras at all of the Phase 2 CMANN sites.	Help confirm possible pollution issues detected by the	ID-4.10(c)	Iva Barnes



#	Identified Improvement	Desired Result	Program Element	Responsible Staff
		CMANN equipment.		
12	Use water quality modeling to identify problem areas for monitoring and follow up.	Identify and eliminate pollution sources.	ID-4.7-CO(f)	Robert Sowah
13	Review and update the CMANN fecal prediction model.	Identify and eliminate pollution sources.	ID-4.7-CO(c)	Robert Sowah
14	Update stormwater inventory attribute information for inventory collected by GIS staff.	Ensure we have accurate inventory data.	ID-1(c)	Ryan Spidel
<b>Construction Site Storm Water Runoff Control</b>				
15	Evaluate the usage of drones for site inspections.	Improve inspection effectiveness.	N/A	Corey Priddy
16	Complete #4 from last fiscal year: Approval of changes in the Erosion Control Ordinance and updates to the Enhanced Measures.	Reduce offsite sediment.	N/A	Corey Priddy
17	Develop a plan for cross-training with the City of Charlotte and the Town of Huntersville.	Improve inspection effectiveness.	N/A	Corey Priddy
18	Look into creating interactive hands-on training components to CMCSI. Will need to have buy in from the City of Charlotte and the Town of Huntersville.	Improve training.	N/A	Corey Priddy
<b>Post-Construction Site Runoff Control</b>				
19	Continue # 3 from last fiscal year, and work with field staff to check for 3rd party inspections and issue NOV's if they are not being submitted.	Improve inspection effectiveness.	N/A	Corey Priddy
20	Work with the Towns to determine if Watershed Ordinances can be changed so that the BMPs would only have to be inspected every 3 to 5 years. (Water Quality would work on this task with help from Permitting and Compliance).	Improve inspection effectiveness.	N/A	Corey Priddy
21	Determine if an Environmental Specialist III, or similar position, is needed to manage the BMP inspection program. Currently, the program takes a significant amount of time for the Environmental Supervisor to perform, taking time away from other needed job duties. Since the number of BMPs increases every year, resource allocation needs to be periodically examined.	Improve inspection effectiveness.	N/A	Corey Priddy
<b>Pollution Prevention &amp; Good House Keeping Program</b>				
22	Ensure that permitted facilities are in compliance with updated NPDES permit requirements.	Ensure compliance.	PP-2	Richard Farmer

#	Identified Improvement	Desired Result	Program Element	Responsible Staff
<b>Total Maximum Daily Loads</b>				
23	Routine monitoring will continue to be performed in the TMDL watersheds by CMSWS. Exceedances of established water quality watch and action levels will be identified and follow up actions conducted as necessary for the identification and elimination of pollution sources	Identify and eliminate sources of elevated fecal coliform bacteria	IW-4(g)	Tim Besier
24	By December 30, 2022, CMSWS will complete a review of Health Department records to determine where failed septic systems have been identified in both the Rocky River and Goose Creek TMDL watersheds. Follow up inspections and monitoring will be performed as necessary to ensure the elimination of sources of fecal coliform bacteria associated with failed septic systems thereby addressing impaired waters.	Identify and eliminate sources of elevated fecal coliform bacteria	IW-2(c)	John Thao
25	By March 31, 2023, major outfalls will be inspected in the Rocky River TMDL watershed. Dry weather flows will be identified and pollution sources eliminated thereby addressing impaired waters.	Identify and eliminate sources of elevated fecal coliform bacteria	IW-2(e)	John Thao
26	Construction activities associated with the restoration of an additional 5,000-foot section of West Branch Rocky River are expected to begin in late FY2023 or early FY2024. Historically, West Branch Rocky River has been severely degraded by storm water flows that erode the stream banks. The restoration project will stabilize the stream banks to reduce erosion and improve water quality.	Improve stream stability and aquatic habitat	N/A	Tim Trautman
27	Conduct targeted surface water sampling in headwater areas of the Goose Creek watershed to further delineate sources of fecal coliform to the system.	Identify and eliminate sources of elevated fecal coliform bacteria	IW-2(m)	John Thao

**Attachment 1: Annual Assessment Report for TMDL Program Implementation**



**Annual Assessment Report for TMDL Program Implementation**

**For Compliance With:  
NPDES Phase II Storm Water Permit Number NCS000395**

**Reporting Period:  
FY2022 (July 1, 2021 through June 30, 2022)**

**Submitted By:  
Charlotte-Mecklenburg Storm Water Services**

**Submittal Date:  
October 2022**

## Table of Contents

Section 1: TMDLs in Mecklenburg County .....	1
Section 2: Assessment of Storm Water Quality Management Program Plan .....	4
2.1 BMPs and Associated Measurable Goals .....	4
2.2 Description of Existing BMPs and Their Effectiveness .....	5
2.2.1 Public Education & Outreach (Section 11.8.1 of SWQMPP) .....	5
2.2.2 Public Involvement and Participation (Section 11.8.3 of SWQMPP) .....	17
2.2.3 IDDE (Section 11.8.4 of SWQMPP) .....	20
2.2.4 Charlotte Water Program .....	29
2.2.5 Sewer Use Ordinance .....	29
2.2.6 Sanitary Sewer System Inspections and Maintenance .....	29
2.2.7 SSO Rapid Response .....	30
2.2.8 Construction Site Storm Water Runoff Control (Section 11.8.7 of SWQMPP) ..	30
2.2.9 Post-Construction Site Runoff Control (Section 11.8.9 of SWQMPP) .....	31
2.2.10 Pollution Prevention and Good Housekeeping (Section 11.8.10 of SWQMPP) ..	32
Section 3: Current TMDL Monitoring Strategies .....	34
3.1 Rocky River Fecal Coliform Monitoring and Land Use Evaluation .....	35
3.2 Goose Creek Fecal Coliform Monitoring .....	38
3.3 Lake Wylie Chlorophyll-A Monitoring .....	39
3.4 Mercury Monitoring Statewide .....	41
3.5 Effectiveness of BMPs Based on Data Analysis .....	41
Section 4: Additional BMP Measures .....	42
4.1 Additional BMPs Implemented for the Rocky River TMDL in FY2022 .....	42
4.2 Additional BMPs Implemented for the Goose Creek TMDL in FY2022 .....	42
4.3 Additional BMPs to be Implemented in FY2023 .....	43
Section 5: Tracking and Reporting Success .....	43
Section 6: TMDL Reporting .....	44

### Tables:

Table 1: Approved TMDLs for Mecklenburg County's Phase I and Phase II Jurisdictions .....	2
Table 2: BMP Summary Table for Impaired Waters with TMDLs .....	4
Table 3: School Presentations Conducted in TMDL Watersheds in FY2022 .....	8
Table 4: Presentations Conducted in FY2022 .....	10
Table 5: Events Attended in FY2022 .....	13
Table 6: Adopt-A-Stream Activities Conducted in TMDL Watersheds in FY2022 .....	18
Table 7: Storm Drain Marking Activities Conducted in TMDL Watersheds in FY2022 .....	19
Table 8: The Big Spring Clean Activities Conducted in TMDL Watersheds in FY2022 .....	19
Table 9: Service Requests Responded to by Jurisdiction in FY2022 .....	21
Table 10: Service Requests and Inspections Conducted in TMDL Watersheds in FY2022 .....	21
Table 11: NOVs and Penalties Issued in TMDL Watersheds in FY2022 .....	22
Table 12: Inspections Conducted at Private Facilities in TMDL Watersheds in FY2022 .....	23
Table 13: Industrial Monitoring in Phase I TMDL Watersheds in FY2022 .....	23
Table 14: CMANN Water Quality Measurements in TMDL Watersheds in FY2022 .....	24
Table 15: Baseflow Exceedances in TMDL Watersheds in FY2022 .....	25
Table 16: Stream Walk Data Collected in Phase I and Phase II TMDL Watersheds in FY2022 ..	27

Table 17: Summary of FY2022 BMP Inspections by Jurisdiction .....	32
Table 18: Municipal Facility Inspections Conducted in Phase II TMDL Watersheds in FY202233	
Table 19: Annual Analysis of the Rocky River Watershed for the Monitoring Plan .....	36
Table 20: NCDWQ Fecal Coliform Data for Site Q7330000 on the Rocky River .....	37
Table 21: CMSWS Fecal Coliform Data for Site # MY9 on the Goose Creek .....	38

## **Figures**

Figure 1: Waters of Mecklenburg County with Approved TMDLs .....	3
Figure 2: FY2022 Stream Walk Basins in Phase I and Phase II.....	28
Figure 3: Water Quality Monitoring Locations in Mecklenburg County .....	35
Figure 4: Geometric Mean for Fecal Coliform on Rocky River Site Q7330000.....	37
Figure 5: Compliance with Fecal Coliform Standard on Rocky River Site Q7330000.....	38
Figure 6: Geometric Mean for Fecal Coliform on Goose Creek Site MY9.....	39
Figure 7: Compliance with Fecal Coliform Standard on Goose Creek Site MY9.....	39
Figure 8: Annual Average Chlorophyll-a Concentration on Lake Wylie.....	40
Figure 9: Annual Average Chlorophyll-a on Lake Wylie Coves, Main Stem and Tributaries ....	41

## Section 1: TMDLs in Mecklenburg County

The purpose of this document is to satisfy the Total Maximum Daily Load (TMDL) reporting requirement for the period July 1, 2021 through June 30, 2022 (FY2022) as specified in Section H of NPDES Phase II Storm Water Permit Number NCS000395.

Several of the TMDL watersheds in Mecklenburg County span both Phase I and Phase II jurisdictions. All Phase I and Phase II TMDL compliance efforts are administered by Charlotte-Mecklenburg Storm Water Services (CMSWS), which includes both City of Charlotte (City) and Mecklenburg County (County) programs. The City's program is responsible for compliance with its Phase I storm water permit and Mecklenburg County's program is responsible for Phase II permit compliance for the County, Charlotte-Mecklenburg Schools, Central Piedmont Community College and the Towns of Cornelius, Davidson, Huntersville, Matthews, Mint Hill, and Pineville. To ensure effective coordination, the City and County have agreed that the City will serve as the lead jurisdiction for compliance with TMDL requirements when the majority of the TMDL watershed lies within the Phase I jurisdiction. When most of the watershed lies within Phase II, the County will serve as the lead. The lead jurisdiction is responsible for coordinating and implementing all required TMDL compliance efforts and submitting all the required plans and reports to the State. They are also responsible for coordinating with the other jurisdictions as necessary in the implementation of compliance efforts. Table 1 indicates the lead jurisdiction for all the approved TMDLs in Charlotte-Mecklenburg.

In January 2022, the State issued its Draft 2022 303(d) list and integrated 305(b) and 303(d) reports. Charlotte-Mecklenburg Storm Water Services (CMSWS) reviewed these reports and determined that no new TMDLs have been approved in Mecklenburg County. Since no new TMDLs have been approved, no changes will be made to the existing Water Quality Recovery Programs and Strategies.

No new TMDLs have been developed for Mecklenburg County since 2014; therefore, all Mecklenburg County TMDLs have been in effect more than 36 months. Based on the requirements contained in Section H of NPDES Permit Number NCS000395, the following must be completed for compliance with the permit requirements for the TMDL watersheds:

- Within 12 months of the final approval of a TMDL, the permittee's annual reports shall include a description of existing programs, controls, partnerships, projects, and strategies (herein referred to as BMPs) to address impaired waters and a brief explanation as to how these BMPs function to restore water quality.
- Within 24 months of the final approval of a TMDL, the permittee's annual reports shall include an assessment of whether additional BMPs are necessary to address impaired waters and a brief explanation as to how these BMPs function to restore water quality.
- Within 36 months of the final approval of a TMDL, the permittee's annual reports shall include a description of additional TMDL compliance activities expected to occur, including a schedule for implementation.

The purpose of the annual report contained herein is to describe how the above-described permit requirements have been satisfied for the approved TMDLs applicable to Mecklenburg County's



Phase II jurisdictions as described in Table 1. Figure 1 shows the locations of these receiving waters in relation to the Phase I and Phase II jurisdictions in Mecklenburg County. Several of the TMDL watersheds include both Phase I and Phase II jurisdictions and CMSWS performs the activities for compliance with TMDLs countywide for all jurisdictions; therefore, where data is available the tables below include information regarding TMDL compliance activities in both the Phase I and Phase II jurisdictions although Mecklenburg County's responsibility is only for Phase II as described above.

Table 1: Approved TMDLs for Mecklenburg County's Phase I and Phase II Jurisdictions

AU Name	AU Number	Class	TMDL Pollutant	IR Category	EPA Approved	MS4 WLA?	Lead Jurisdiction
Irwin Creek	11-137-1	C	DO	1	2/5/1996	No	Charlotte
			Fecal Coliform	4t	3/28/2002	No	Charlotte
			Turbidity	4i	2/8/2005	Yes	Charlotte
Long Creek	11-120-(0.5)	C	Turbidity	3i	2/8/2005	Yes	Charlotte
Long Creek	11-120-(2.5)	WS-IV	Turbidity	3i	2/8/2005	Yes	Charlotte
Little Sugar	11-137-8a	C	DO	1	2/5/1996	No	Charlotte
			Fecal Coliform	4t	3/28/2002	No	Charlotte
Little Sugar	11-137-8b	C	DO	1	2/5/1996	No	Charlotte
			Fecal Coliform	4t	3/28/2002	No	Charlotte
Little Sugar	11-137-8c	C	DO	1	2/5/1996	No	Charlotte
			Fecal Coliform	4t	3/28/2002	No	Charlotte
			Turbidity	1i	2/8/2005	Yes	Charlotte
McAlpine Creek	11-137-9a	C	DO	1	2/5/1996	No	Charlotte
			Fecal Coliform	4t	3/28/2002	No	Charlotte
			Turbidity	1i	2/8/2005	Yes	Charlotte
McAlpine Creek	11-137-9b	C	DO	1	2/5/1996	No	Charlotte
			Fecal Coliform	4t	3/28/2002	No	Charlotte
			Turbidity	1i	2/8/2005	Yes	Charlotte
McAlpine Creek	11-137-9c	C	DO	1	2/5/96	No	Charlotte
			Fecal Coliform	4t	3/28/2002	No	Charlotte
			Turbidity	1i	2/8/2005	Yes	Charlotte
McAlpine Creek	11-137-9d	C	DO	1	2/5/1996	No	Charlotte
			Fecal Coliform	4t	3/28/2002	No	Charlotte
			Turbidity	1i	2/8/2005	Yes	Charlotte
Sugar Creek	11-137b	C	Fecal Coliform	4t	3/28/2002	No	Charlotte
			Turbidity	4i	2/8/2005	Yes	Charlotte
Sugar Creek	11-137c	C	Fecal Coliform	4t	3/28/2002	No	Charlotte
			Turbidity	4i	2/8/2005	Yes	Charlotte
McKee Creek	13-17-8-4	C	Fecal Coliform	4t	8/1/2003	Yes	Charlotte
Rocky River	13-17a	C	Fecal Coliform	4t	9/19/2002	Yes	Mecklenburg
Steele Creek	11-137-10	C	Fecal Coliform	SC TMDL	5/2007	Yes	Charlotte
Lake Wylie	11-122	C	Chlorophyll-a	1	2/5/1996	No	Mecklenburg
Lake Wylie	11-(123.5)a	C	Chlorophyll-a	1	2/5/1996	No	Mecklenburg

AU Name	AU Number	Class	TMDL Pollutant	IR Category	EPA Approved	MS4 WLA?	Lead Jurisdiction
Goose Creek	13-17-18a	C	Fecal Coliform	4t	7/8/2005	Yes	Mecklenburg
Goose Creek	13-17-18b	C	Fecal Coliform	4t	7/8/2005	Yes	Mecklenburg

**Integrated Reporting (IR) Category Description (applicable to table above):**

- 1: Parameter is meeting criteria.
- 1i: parameter is meeting criteria and there is an approved TMDL in place for a different parameter that addresses the indicator parameter
- 1t: Parameter is meeting criteria and there is an approved TMDL in place for that parameter. The TMDL remains in place to ensure that criteria are maintained.
- 3i: Data are insufficient to make an assessment and there is an approved TMDL in place for a different parameter that addresses the indicator parameter.
- 4i: Parameter is exceeding criteria and there is an approved TMDL in place for a different parameter that addresses the indicator parameter.
- 4t: Parameter is exceeding criteria and there is an approved TMDL in place for that parameter.

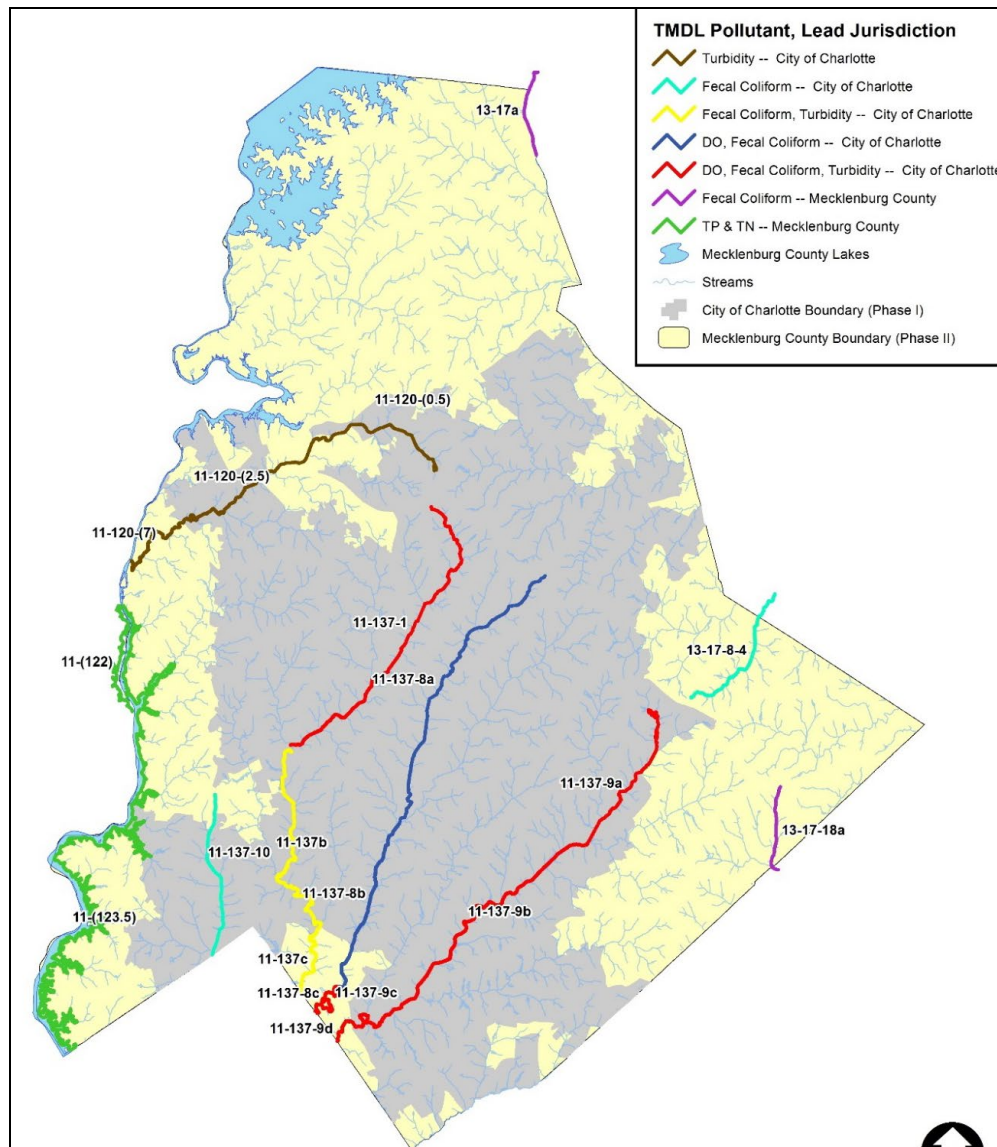


Figure 1: Waters of Mecklenburg County with Approved TMDLs

## Section 2: Assessment of Storm Water Quality Management Program Plan

This Section discusses each of the BMPs and their Measurable Goals for reducing non-point source pollutant loading to the receiving streams of TMDL watersheds to the maximum extent practicable as described in the Storm Water Quality Management Program Plan (SWQMPP), including implementation status and documentation of those activities completed during FY2022. Tables 3 through 18 describe the activities completed in FY2022 for compliance with TMDLs. Where applicable, compliance activities are described for both the Phase I and Phase II jurisdictions for informational purposes since several of the TMDL watersheds include both jurisdictions. However, Mecklenburg County is only responsible for Phase II Permit compliance for the TMDLs developed for Goose Creek, Rocky River and Lake Wylie. Tables 3 through 18 also include compliance activities performed in the McDowell Creek watershed where applicable even though a watershed management plan, not a TMDL, applies (Category 4B).

### 2.1 BMPs and Associated Measurable Goals

During FY2022, all the BMPs and measurable goals identified in Phase II Permit NCS000395 and the associated SWQMPP were effectively fulfilled as described in Table 2. The table also provides the Activity Report number from the County's Cityworks database that includes documentation of the work completed for each BMP. The subsections following Table 2 describe the existing programs, controls, partnerships, projects, and strategies to address impaired waters (herein referred to as BMPs) and a brief explanation as to how these BMPs address impaired waters. These subsections also describe the specific activities completed in FY2022 through the implementation of these BMPs and whether they will be continued in FY2023 based on an assessment of their effectiveness. Section 3 provides a further assessment of current BMP effectiveness based on an analysis of applicable monitoring data. Section 4 provides a description of additional BMPs implemented in FY2022, as well as those planned for implementation in FY2023 along with an implementation timeline, and a brief explanation as to how these additional BMPs will address impaired waters.

Table 2: BMP Summary Table for Impaired Waters with TMDLs

#	BMP	Measurable Goals	Schedule (years)					Responsible Staff	Measurable Goal Met	Activity Report #
			1	2	3	4	5			
IW-1	Evaluate Impaired Waters	Evaluate the current 305(b) report and 303(d) list for N.C. and identify those impaired waters with an approved TMDL that are the responsibility of the Phase II jurisdictions.	X	X	X	X	X	Timothy Besier	YES	62984
IW-2	Develop and Implement BMPs	Develop and implement appropriate structural and/or non-structural BMPs to reduce nonpoint source pollutant loading to the MEP in the TMDL watersheds. Within 12 months of the final approval of a TMDL, an annual	X	X	X	X	X	Timothy Besier,  Iva Barnes,  John Thao  Ryan Spidel	YES	61903

#	BMP	Measurable Goals	Schedule (years)					Responsible Staff	Measurable Goal Met	Activity Report #
			1	2	3	4	5			
		report shall include a description of existing BMPs to address impaired waters and a brief explanation as to how these BMPs will function to restore water quality.								
IW-4	Assess, Report and Modify BMPs	Assess the effectiveness of existing BMPs and identify and implement additional measures as necessary to address impaired waters to the MEP. Incorporate additional measures into the Storm Water Plan and annual Work Plan for implementation. Submit to the State an annual report summarizing assessment results, identifying additional BMPs as necessary, and providing a brief explanation as to how these BMPs will function to restore water quality. Include in the annual report a schedule for implementation of BMPs.	X	X	X	X	X	Timothy Besier	YES	63004

## 2.2 Description of Existing BMPs and Their Effectiveness

The primary pollutants of concern for the TMDL watersheds where Mecklenburg County is the lead, including Goose Creek, Rocky River and Lake Wylie, are fecal coliform bacteria and nutrients (see Table 1). CMSWS has reviewed existing BMPs to address impaired waters and has identified those described in the following subsections as suitable for best addressing the TMDL pollutants of concern and will therefore be continued in FY2023. Details regarding BMP implementation are provided in the SWQMPP.

### 2.2.1 Public Education & Outreach (Section 11.81 of SWQMPP)

The following existing public education and outreach activities have been identified as suitable for addressing the pollutants of concern in the TMDL watersheds. These BMPs will address impaired waters by informing the community of the impacts of the pollutants of concern on water bodies and the steps that the public can take to reduce these pollutants. During FY2022, these BMPs were effectively implemented in the Phase I and Phase II jurisdictions in Mecklenburg County.

1. Utility Bill Inserts
2. Brochures, Environmental Notices and Newsletters
3. Print Ads

4. Media Campaign
5. Social Media
6. Workshops and Video Taped Messages
7. Web Pages
8. Educational Presentations and Public Events
9. Storm Water Helpline

The following specific public education and outreach activities were completed by CMSWS in the Phase I and Phase II jurisdictions that will reduce discharges of pollutants of concern in the TMDL watersheds.

During FY2022, CMSWS' pollution prevention education included the distribution of educational materials by staff when conducting inspections and responding to citizen requests for service. All Phase II town halls were supplied with residential pollution prevention brochures. All town libraries were also supplied material, except for Pineville. The following handouts/brochures/pamphlets are available to staff for distribution:

- A Guide to Used Oil Recycling
- Scoop the Poop (proper handling of pet waste)
- What Goes In Here Ends Up Here – postcard regarding neighborhood trash pollution
- A Resident's Guide to Pollution Prevention
- Volunteer Opportunities (English and Spanish)
- A Brief Look at Charlotte-Mecklenburg Storm Water Services – Your Storm Water Fees at Work
- Grease Free (proper disposal of grease from Charlotte-Mecklenburg Utilities)
- Household Hazardous Waste – What do you do with left over chemicals
- Environmental Notices for Homeowners– Disposal into the storm drain is against the law (English, Spanish, Chinese, Vietnamese, and Korean)
- Environmental Notices for Businesses– Disposal into the storm drain is against the law (English, Spanish, Chinese, Vietnamese, and Korean)
- Water Watchers door hanger
- Household Hazardous Waste slider
- Dispose of Leaves Properly postcard
- Water Quality Buffers postcard
- When Surface Waters Turn Colors (Pollen, Tannin, Iron Bacteria)
- Automotive Facilities Pollution Prevention Poster (English and Spanish)
- Clean Boating BMP
- Fish Consumption Advisory
- Invasive, Exotic Plants
- NC Division of Natural Resources Fact Sheets:
  - Iron Bacteria
  - Surface Film
  - Water Foam
- Non-Structural Best Management Practices Handout
  - Mobile Detailer
  - Landscapers
  - Painters
  - Contractors

- Carpet Cleaners (English and Spanish)
  - Vehicle Service
  - Food Service (Chinese, English, and Spanish)
  - Multi-Family Complexes
  - Stone Cutting & Fabrication Industry
  - Concrete Industry (English and Spanish)
  - Commercial Property Management
  - Asphalt Sealing (English and Spanish)
  - Pool & Spa Maintenance (English and Spanish)
  - Horizontal Directional Drilling
  - Breweries
  - Equipment Repair
  - Pressure Washers (English and Spanish)
  - Rooftop Workers
  - Realtors
  - Well Drillers (English and Spanish)
  - Utility Contractors (English and Spanish)
- Structural Best Management Practices Handout
  - Dry Detention
  - Rain Garden
  - Sand Filter
  - Stormwater Wetland
  - Wet Pond

Additionally, the following promotional items are available for distribution at events:

- Hand Sanitizer
- Lip Balm
- Ink Pens
- Temporary Stormy Tattoos
- Stormy Stickers
- Magnets
- “Scoop the Poop” bag dispenser w/flashlight
- Stormy Plush
- Color changing cups
- Sunscreen
- Flashlights
- Keychains
- Lunch boxes
- Umbrellas
- Water Bottles
- Rain Gauges
- Grocery bags
- Whistles
- Golf/boat towels
- Koozies



During FY2022, educational content was developed and disseminated to the Phase II co-permittees covering the targeted pollutants described above. These newsletters focused on the actions the public should take to reduce pollution, including participating in volunteer programs, and reporting suspected pollution problems. The @StormWaterCM social media accounts (Facebook, Twitter & Instagram) were used as the main method to help disseminate messages to the Towns. CMSWS staff emailed Town contacts at the beginning of each month with a calendar list of the relevant posts to share with their followers. Phase II social media contacts were then responsible for sharing messages on the Towns' or institutions' social media accounts. Town of Pineville was also emailed messages to be included in the local town mailer. The topics for Pineville this year included preventing sewer overflows, proper grease disposal, sources of sediment and fecal coliform, and the promotion of volunteer activities. In order to address compliance with the Goose Creek TMDL, additional social media messages were created for the Town of Mint Hill that focused on promoting the sale of tree seedlings and rain barrels by the Mecklenburg County Soil and Water Conservation District and how to properly dispose of cooking oil and grease. Additional water quality education topics were included with monthly emails to volunteers when space was available.

In FY2022, the development of an Underserved Communities Reach Plan (UCRP) kicked off which is aimed at reviewing all public education and public involvement programs offered and provide recommendations for improvement to better reach diverse and underserved communities.

Emails were sent to over 700 Phase II teachers in September, October, November, January, and February. These emails included information about the CMSWS educational programs. Programs offered include activities on pollution prevention, the history of water usage and pollution of drinking water sources in Mecklenburg County, a demonstration of the Enviroscope model, A Day in the Life of Water Quality Staff, and a macroinvertebrate identification lesson. All programs were offered virtual and in-person. As a result, 9 school presentations were given in the Phase II jurisdiction to 250 students as follows:

- 1/11/22, Lake Norman Charter School – 8th Grade, Enviroscope and Career Video, 200 students
- 3/2/22, Blythe Elementary – 2<sup>nd</sup> Grade, Enviroscope, 50 students

Also, in FY2022 a new children's video was created called "Lessons with Stormy" featuring an animated Stormy the Turtle which provides basic lessons of pollution prevention and the street to stream concept. This video will be used to reach elementary age students county-wide.

School presentations were additionally performed in the Phase I jurisdiction. Table 3 describes the school presentations conducted in the Phase I and Phase II TMDL jurisdictions in Charlotte-Mecklenburg during FY2022.

Table 3: School Presentations Conducted in TMDL Watersheds in FY2022

TMDL Watershed	# of School Presentations	# of Students
<b>Phase I Jurisdictions</b>		
Irwin	4	84



TMDL Watershed	# of School Presentations	# of Students
Lake Wylie	7	110
Little Sugar	28	695
Long	1	50
McAlpine	36	744
<b>Phase II Jurisdictions</b>		
McDowell	8	200
<b>Totals</b>	<b>84</b>	<b>1,883</b>

In addition to school presentations, CMSWS conducted 43 public presentations, both virtual and in-person, described in Table 2 and attended 13 events described in Table 3. During FY2022, the “Scoop the Poop” campaign included Social Media Posts and videos, vehicle magnets, presence at multiple dog events around the County including Pawsitively Matthews, Pet Palooza, and Subaru for the Love of Pets event. During FY2022, informational pages covering a wide variety of topics were maintained on the Storm Water Services website, including current water quality conditions, storm water pollutants and ways to minimize them, reporting pollution, volunteering, municipal storm water projects/activities, etc. These web pages also provide a means to register for various volunteer initiatives. The targeted pollutants on the pollution prevention pages include: bacteria and pet waste, turbidity, and sediment, as well as phosphorus, nitrogen, organics, fertilizers, pesticides, yard waste, surfactants, hydrocarbons, pH, and toxic compounds. The targeted audiences include residential, commercial, and institutional. The general messages promoted on the webpages are street to stream, only rain should go down the storm drain, and be a Good Neighbor/Volunteer. The webpages also provide contacts for reporting pollution problems/concerns and submitting questions to staff. During FY2022, Google Analytics showed CMSWS’s webpages had 426,455 page views and 178,115 unique page views, which is an increase from the 417,437 page views in FY2021. The pages most often visited other than the homepage were the Streams and Lakes page, and the Storm Water Design Manual.

For Industrial/Commercial Education, a new Concrete Industry BMP sheet was created. CMSWS staff updated the handouts, developed a list of current businesses in the county, and drafted a cover letter. The handouts and letters were completed in English and Spanish. The final mailing list identified 168 concrete contractors. CMSWS also collaborated with Charlotte Water and created a Utility Contractor BMP sheet for horizontal drilling for distribution in the Critical Watershed areas along the lakes. The BMP sheet will be mailed in FY2023. Utility bill inserts were sent to over 200,000 Charlotte Water customers in July, August, September, January, February, April, and May related to water quality and pollution prevention.

A Safe Swimming education and outreach campaign was developed to reach residents who use lakes in Mecklenburg County for swimming and recreation. Due to increased threats to water quality in these recreational waters, a campaign was developed with the following 4 purposes:

1. Promote the CharMeck Alert System which will be a major component of the notification process for No Swimming Advisories. (Additional notification procedures are outlined in the Water Quality Program Communication Plan)
2. Promote the 311 hotline for residents to report potential problems they see in the lakes.

3. Promote the idea that it is best to wait 72 hours after rain events before swimming, especially in coves or near outfalls to reduce the chance of swimming in waters that may be high in bacteria due to stormwater impacts.
4. Provide education/outreach for citizens regarding cyanobacteria blooms.

A marketing and media plan was developed to promote the CharMeck Alert notification system and the other items listed above. The plan was developed to focus on the 4 messages outlined above. It included paid digital advertising on various media outlets including social media, community newsletters, and airplane banners. In addition to a media plan, a Utility Bill Insert (UBI) was developed and distributed in the spring of 2022, a direct mailing was conducted to all waterfront property owners and various give away items such as boat key rings, can koozies, and boat towels were created with educational messaging and distributed at boat ramps and other outlets. Social media posts were routinely conducted during spring and summer, and short educational videos were created and posted.

Table 4: Presentations Conducted in FY2022

Date	Group Name/Audience	# of Participants	Presentation Title/Topic
7/15/2021	Charlotte-Mecklenburg Storm Water Services Advisory Committee	16	FY2022 Capital Improvement Program Annual Report
7/19/2021	Belmont City Council	40	Enhanced Erosion Control Practices
8/18/2021	Cambridge Grove Community	30	Waters of Huntersville
8/19/2021	Charlotte-Mecklenburg Storm Water Services Advisory Committee	25	FY2022 SWAC Annual Report; Charlotte Strategic Plan
8/23/2021	Huntersville Rotary Club	30	Waters of Huntersville
9/16/2021	Charlotte-Mecklenburg Storm Water Services Advisory Committee	22	Program for Public Information Annual Update
9/16/2021	League of Women Voters Environmental Team	8	Regional Storm Water Issues and Actions
9/16/2021	Covenant Presbyterian Church	22	Adopt-A-Stream, Volunteer Opportunities, Water Quality
10/12/2021	Charlotte Wildlife Stewards	40	Stream Restoration: Improving Habitat and Benefits to Aquatic Life
10/21/2021	Charlotte-Mecklenburg Storm Water Services Advisory Committee	26	City Unified Development Ordinance; City's Surface Water Quality and Environmental Permitting Program Briefing
11/2/2021	Henrico County Virginia Government Staff	8	Floodplain Buyout Program

<b>Date</b>	<b>Group Name/Audience</b>	<b># of Participants</b>	<b>Presentation Title/Topic</b>
11/4/2021	Davidson College	40	Waters of Davidson
11/5/2021	Palisades Master HOA	2	Palisades Development
11/5/2021	Palisades Regency HOA	6	Palisades Development
11/9/2021	Mecklenburg County Environmental Stewardship Committee	20	Mecklenburg County Buffer Requirements
11/18/2021	Charlotte-Mecklenburg Storm Water Services Advisory Committee	16	City Capital Programs and Unified Development Ordinance
11/18/2021	UNCC ASCE Student Chapter	30	Stream Restoration Project along Toby Creek
12/6/2021	Stevens Grove HOA	30	Compliance with PCO BUA Requirements
12/7/2021	Post Construction Workshop	150	The Importance of Post Construction Regulatory Controls for Reducing Stream and Flooding Impacts
12/7/2021	Regional Stormwater Partnership of the Carolinas	150	RSPC Post Construction Workshop
12/7/2021	Charlotte-Mecklenburg Surveyors Association	46	Buffer & Impervious Area restrictions
12/16/2021	Charlotte-Mecklenburg Storm Water Services Advisory Committee	11	FY2022 Budget Review
1/20/2022	Charlotte-Mecklenburg Storm Water Services Advisory Committee	29	FY2023 Budget Information and Update
2/4/2022	National Pavement Expo	60	Stormwater Pollution Control Ordinance and "High PAH" Pavement Products
2/17/2022	Charlotte-Mecklenburg Storm Water Services Advisory Committee	22	FY2023 Budget Recommendations
2/21/2022	Environmental Educators of North Carolina	10	Spreading the Message without Spreading COVID
3/1/2022	Keep Charlotte Beautiful Board	20	CMSWS: Public Involvement Spring Update
3/1/2022	West Branch Rocky River Stakeholder Group	30	West Branch of Rocky River Stream Restoration Project
3/4/2022	Wildlife Habitat	30	Biological Monitoring and

Date	Group Name/Audience	# of Participants	Presentation Title/Topic
	Stewards		Macroinvertebrates
3/10/2022	Palisades Master HOA	4	Palisades Development
3/14/2022	ASCE/EWRI Stormwater O&M Conference	35	Charlotte's Experience in Development an MS4 O&M Manual
3/17/2022	Charlotte-Mecklenburg Storm Water Services Advisory Committee	16	Mecklenburg SWS FY2023 Budget Review
3/23/2022	Girl Scouts	15	Enviroscape
3/24/2022	North Carolina Water Resources Research Institute	30	Real-Time Prediction of Fecal Pollution in Charlotte-Mecklenburg Surface Waters Using Machine Learning Models
4/11/2022	Hidden Valley Community Association	15	Hidden Valley Ecological Garden Field Tour
4/15/2022	The Sanctuary Neighborhood Association	10	Stormwater Pollution Prevention
5/10/2022	Mecklenburg County Environmental Stewardship Committee	30	Overview of Mecklenburg County Stream Restoration
5/19/2022	Charlotte-Mecklenburg Storm Water Services Advisory Committee	8	Charlotte's Pollution Control Ordinance Enforcement Program and Orbit Energy Case History
5/24/2022	Catawba-Wateree Water Management Group	6	Toby and Mallard Creek Stream Restoration
5/25/2022	Regional Stormwater Partnership of the Carolinas	150	RSPC Stormwater System Inventory and Dry Weather Flow Evaluations
6/10/2022	Emergency Management, City and County Staff, Town Leaders	55	NWS Warning System and FINS Live Workshop
6/14/2022	Charlotte-Mecklenburg Storm Water Services Advisory Committee	24	<b>Post Construction Ordinance</b>
6/23/2022	Mecklenburg Ministries	42	High PAH sealant product ban
<b>Total</b>		<b>1,409</b>	

Table 5: Events Attended in FY2022

Date	Event Name	Estimated # of Citizens Contacted	Materials Displayed
8/3/2021	National Night Out	100	CMSWS volunteer brochure and SWAG (cups, flashlights, pens)
8/7/2021	Riverfest	270	CMSWS volunteer brochure, SWAG (cups, flashlights, pens, hand sanitizer), Prize Wheel
9/22/2021	Bark in the Park	5	Poop bag holders
10/9/2021	Subaru for the Love of Pets Adoption and Rabies Clinic	20	SWAG (poop bag holders, reusable bags, coloring books, flashlights)
10/16/2021	Nature at Night	40	Fish game, lake handouts, volunteer brochure, SWAG (coloring books, flashlights, coloring pencils, reusable bags)
10/16/2021	Kids in Nature Day	120	Bugs, volunteer brochure, SWAG (coloring books, flashlights, coloring pencils, reusable bags)
10/21/2021	Charlotte Wildlife Stewards i-Spy Event	20	Stormy, Enviroscape, SWAG (coloring books, flashlights, cups)
11/6/2021	Pawsitively Matthews	105	SWAG (Poop bag holders, reusable bags, flashlights, and coloring books)
1/25/2022	Carolina Green Industry Network	70	Lawn Care BMP Trifold, Prize Wheel, SWAG (cups, pens, flashlights)
4/21/2022	Earth Day Celebration for Windsor Park Neighborhood	250	Bugs, Prize Wheel, SWAG (cups, poop bag holders, coloring books, reusable bags)
4/23/2022	Charlotte Earth Day Celebration	130	Trifold, Plinko, SWAG (Whistles, coloring books, colored pencils, ChapStick, poop bag holders)
4/30/2022	Bark in the Park	100	Poop bag holders
4/30/2022	Earth Jam	100	Bugs, Prize Wheel, SWAG (Whistles, coloring books, cups, pens, flashlights)
5/14/2022	Catawba Riverfest	343	Stormwater handouts, Plinko, Trifold, SWAG (poop bag holders, hand sanitizer, ChapStick, notebooks, pens)
5/14/2022	Pet Palooza	100	SWAG (Poop bag holders, cups, pens, flashlights, coloring books)
<b>Total</b>		<b>773</b>	

For FY2022, CMSWS was under contract with Saturday Brand for creative design, and The Agency Marketing Group for media buying. CMSWS staff and staff from The Agency Marketing Group and Saturday Brands met monthly to discuss the budget and the media

campaign direction. A water quality and volunteer strategic marketing/advertising strategy was created which outlines the creative and media plans for FY2022. The three focuses of the media campaign are Reporting Pollution, Volunteering, and Flood Safety. Additionally, there is a City of Charlotte only campaign on Infrastructure. The media campaign was also used to promote the 311 helpline and the CLT+ app for reporting suspected pollution problems. The campaign included a media buy that utilized the following routes of exposure:

### **TRADITIONAL MEDIA** – Broadcast Television, Radio, Billboards & Print

Traditional media is measured using the following:

- Impressions – An impression is the number of individuals that have seen and/or heard the ad at least once.
- Reach – Indicated as a percentage of the total audience chosen. Ex: all persons 25 to 54 years of age, or all persons 18 year of age or older.
- Frequency – The average number of times an individual has seen or heard the ad during a specific time frame or campaign flight.

**Broadcast Television** – CMSWS used WSOC, located within the Charlotte designated media area (DMA), to promote Storm Water messaging. WCNC is viewed by 70% of the Adults in the Charlotte DMA each week. The DMA includes 13 counties surrounding Mecklenburg with Mecklenburg accounting for just over half of the viewership.

**Radio** – The buy included Beasley Radio (WPEG and WBAV) and La Rza & Latina 102.1 to target African American and Hispanic listeners to promote water quality initiatives, volunteer programs, and to educate about flood safety.

**Print** – The only print media used this year were the Utility Bill Inserts (UBI) that are included in the Charlotte Water bill. A schedule of the UBIs and the message topics were agreed on by the team and planned around scheduled events, including Hurricane Season, The Big Spring Clean, Infrastructure Week, etc.

**DIGITAL MARKETING** – On-line Digital Display, Pay-Per-Click (PPC) Campaigns, Axios Charlotte Promotions, Charlotte Five Articles and Data Fusion.

Digital Marketing is measured using the following:

- Targeted Impressions – An impression targeted to a specific audience characteristic, such as age, gender, interests, etc. Of the targeted individuals, this counts the number of individuals that have seen and/or heard the ad at least once.
- Interaction/Clicks – The number of people that have clicked on an ad or word phrase bringing them to your website or landing page.

**Digital Display** – Digital display advertising is graphic advertising on websites and apps through banners made of text and images. The main purpose of display advertising is to deliver general advertisements and brand messages to site visitors. CMSWS online display ads are visible and clickable on a variety of websites within the targeted geography of Mecklenburg County. These sites are monitored to assure they are legitimate and appropriate for everyone.



**Pay-Per-Click (PPC)**- PPC is an online advertising model in which advertisers pay each time a user clicks on one of their paid search ads using Google.com. CMSWS strategically bid on short keywords and longer tail keyword phrases and when those terms are searched, our results show up at the top of the Google Search results. CMSWS ads click through to a designated website or landing page.

**Charlotte Agenda** – Charlotte Agenda, now known as Axios Charlotte, is a very popular source for Charlotte news and things to do in and around Charlotte. CMSWS purchased a monthly calendar event on the site for Second Saturday Volunteer, VolunThursday, and Creek Week Events

**Charlotte Five Articles** – CharlotteFive is a part of The Charlotte Observer that is similar to Axios Charlotte. CharlotteFive is a very popular website, daily email and social media platform. CMSWS partnered with CharlotteFive to have specific articles written by the editors. The articles were 300 to 500 words with two or three pictures.

**Data Fusion** – Data Fusion Marketing uses an audience-based campaign across Connected Television, Display and Video targeted at the household level to promote messaging of Charlotte-Mecklenburg Storm Water Services. It uses OTT (Over the Top) television that is streamed digitally through services such as Hulu, Roku or any other streaming service. This digital approach is geo-targeted to Mecklenburg County and individual behaviors and actions rather than just a broad-based outreach approach.

**SOCIAL MEDIA** – Facebook and Instagram.

Social Media is measured using the following:

- Impressions – An impression is the number of individuals that have seen and/or heard the ad at least once.
- Reach – The number of people “Stopped” or paused on an ad or post in a social media feed.
- Engagements - An engagement is when a person, likes, comments or shares a social media ad or post.
- Clicks- The number of times a person clicks on our ads to be taken to a page of the website or landing page.

**Facebook** – CMSWS used Facebook advertising as since this platform has seen great success in the past. Facebook events have helped to build a community of active volunteers. Boosted posts also remain a great way to increase engagement for both current fans and beyond. In addition, Facebook's retargeting and lookalike capabilities have been instrumental in keeping interested citizens engaged and also reaching new audiences. Facebook's lookalike audience targeting allows CMSWS to make a mirror audience of current Facebook fans and target them with content. This platform also allows CMSWS partners to share content and vice versa.

**Instagram** – Instagram is an affordable advertising option with great targeting capabilities. It is not only a great way to expand reach to young people (high schoolers, college students, and



recent grads), there is also a growing presence of older audiences. It has shown a growth rate of 3.7% which is more than Facebook and Twitter. As the platform continues to expand, both "in feed" and "stories" ads are a great way to drive traffic to CMSWS' website. This year staff began making more use out of Instagram Stories and Reels, which are new tools to engage with followers. Stories can contain, images, words, interactive quizzes, polls, and the ability to repost images from volunteers or other partners.

**Twitter** – Twitter is another great social media tool to get information out quickly and allows users to “retweet” or repost CMSWS information.

**Sprout Social** – Sprout Social is an online social media platform used for the posting, responding to comments, and data tracking of multiple social channels. This was purchased in July 2019 to help with social media posting and management, which was a responsibility that was pulled from outside vendors and brought in house in FY20 due to policy changes.

The results of CMSWS' Water Quality, Volunteer, Flood, and Infrastructure media campaigns for FY2022 are summarized below.

#### **Social Media**

- Impressions: 3,010,357
- Reach: 992,044
- Engagements: 481,717
- Post Link Clicks: 72,053

#### **PPC, Display & Data Fusion**

- Impressions: 2,637,703
- Clicks: 3,198

#### **YouTube**

- Impressions: 2,125,390
- Clicks: 1,789

#### **Charlotte Five**

- Impressions: 16,800
- Articles: 4

#### **Charlotte Agenda**

- Impressions: 7,550
- Calendar Posts: 7

#### **Broadcast Television**

- Impressions: 1,202,944
- Reaches: 493,200
- Reach: 24%

- Frequency: 1.6
- Ads: 150

**Radio**

- Impressions: 1,413,600
- Reaches: 324,200
- Reach: 75.4%
- Frequency: 4.6
- Ads: 352

**Webpage** – CMSWS’ webpage, StormWater.CharMeck.org contains information about stormwater projects, stormwater pollution reporting, flooding, surface water quality, volunteer opportunities, fees, and regulations. Edits to the webpage are made throughout the year, with staff performing webpage reviews at least twice per fiscal year. During FY2022, Google Analytics showed CMSWS’ webpages had 426,455 page views and 178,115 unique page views, which is an increase from the 417,437 page views in FY2021.

During FY2022, the BMPs implemented for the Public Education and Outreach Program were evaluated and found to be effective at reducing non-point source pollutant loading to the receiving streams of TMDL watersheds to the maximum extent practicable fulfilling the requirements of the Phase II Permit and SWQMPP. Therefore, these BMPs will continue to be used in FY2023 to comply with TMDL requirements.

## 2.2.2 Public Involvement and Participation (Section 11.8.3 of SWQMPP)

The following existing public involvement and participation activities have been identified as suitable for addressing the pollutants of concern in the TMDL watersheds. These BMPs address impaired waters by involving the public in program development and implementation to reduce the pollutants of concern.

1. Adopt-A-Stream
2. Storm Drain Marking
3. Annual Surface Water Clean Up Event (The Big Spring Clean)

During FY2022, Adopt-A-Stream and Storm Drain Marking were effectively implemented in the Phase I and Phase II jurisdictions in Mecklenburg County. Additionally, the annual surface water clean-up event, referred to as The Big Spring Clean, was held on March 26, 2022. Activities completed in FY2022 for each program are summarized below.

Adopt-A-Stream – During FY2022, 163 groups that included a total of 3,128 volunteers donated 6,886 hours toward the completion of 208 stream cleanups resulting in the removal of 83,802 pounds of trash and debris from 130.36 miles of streams in Mecklenburg County’s Phase I and II jurisdictions. The breakdown of miles of streams cleaned up in each jurisdiction is as follows:

- Charlotte: 109.9 miles
- Cornelius: 0.5
- Davidson: 6.9 miles
- Huntersville: 7.5 miles

- Matthews: 8.2 miles
- Mecklenburg County: 44.6 miles
- Pineville: 7.1 miles

The names of the stream segments cleaned are; Back Creek, Blankmanship Branch, Briar Creek, Campbell Creek, Clarks Creek, Coffey Creek, Dairy Branch, Doby Creek, Duck Creek, Edwards Branch, Four Mile Creek, Gar Creek, Irvins Creek, Irwin Creek, Kings Branch, Lake David, Little Hope Creek, Long Creek, Little Sugar Creek, Mallard Creek, McAlpine Creek, McDowell Creek, McKee Creek, McMullen Creek, Ramsey Creek, Rocky Branch, Rocky River West Branch, Roosevelt Wilson Park Pond, Six Mile Creek, Stewart Creek, Sugar Creek, Toby Creek, Torrence Creek and Walker Branch, as well as the Catawba River. A total of 177.5 stream miles are adopted in Phase I and Phase II jurisdictions. These efforts were completed under the County's Adopt-A-Stream Program. All data and information regarding these cleanups are available in the County's Volunteer Database.

Table 6 describes the Adopt-A-Stream activities conducted in the Phase I and Phase II TMDL watersheds in Charlotte-Mecklenburg during FY2022.

Table 6: Adopt-A-Stream Activities Conducted in TMDL Watersheds in FY2022

TMDL Watershed	# Stream Miles Cleaned	Lbs. Trash/Debris Removed
<b>Phase I Jurisdiction</b>		
Irwin Creek	23.17	24,715
Little Sugar Creek	38.66	26,802
Long Creek	2.78	4,355
McAlpine Creek	17.32	4,495
Steele Creek	3.35	2,530
Sugar Creek	11.28	10,230
<b>Phase II Jurisdictions</b>		
Goose Creek	1.09	50
Little Sugar Creek	7.05	4690
Long Creek	1	780
McAlpine Creek	8.17	3735
McKee Creek	1	350
McDowell Creek	6.09	445
Rocky River	8.51	555
Steele Creek	0.89	70
<b>Totals</b>	<b>130.36</b>	<b>83,802</b>

Storm Drain Marking – Storm drain marking is one of the public involvement programs outlined in CMSWS' Public Involvement Standard Operating Procedures. This SOP was reviewed in August 2021 and finalized in January 2022. In FY2022, 61 volunteers spent 84 hours marking 350 storm drains in Mecklenburg County's Phase II jurisdictions. All data and information regarding the storm drain marking activities was input into the County's Volunteer Database. During FY2022, there was a decrease in storm drain marking activities, due to a limitation of supplies. CMSWS staff placed their annual order of storm drain markers in the Spring of 2021; however, due to a supply chain issue with the top-protective coat that is used on the storm drain

markers, most of the order was not fulfilled until June 2022. The program was not highly promoted; however, a couple of hosted events were held, and staff mailed kits out to any residents who inquired about them. The breakdown by jurisdiction is as follows:

- Cornelius: 1 event, 4 volunteers, 4 hours, 56 markers, 0 problems reported
- Davidson: 1 group, 2 events, 2 volunteers, 3 hours, 13 markers, 0 problems reported
- Huntersville: 1 group, 3 events, 6 volunteers, 12 hours, 51 markers, 0 problems reported
- Matthews: 3 groups, 5 events, 36 volunteers, 39 hours, 80 markers, 0 problems reported
- Mint Hill: 1 planned event that was rained out
- Pineville: 1 event, 13 volunteers, 26 hours, 150 markers, 0 problems reported

Storm Drain Marking activities are also performed in the Phase I jurisdiction. Table 7 describes the Storm Drain Marking activities conducted in the Phase I and Phase II TMDL watersheds in Charlotte-Mecklenburg during FY2022.

Table 7: Storm Drain Marking Activities Conducted in TMDL Watersheds in FY2022

<b>TMDL Watershed</b>	<b># Storm Drains Marked</b>
<b>Phase I Jurisdiction</b>	
Irwin Creek	92
Lake Wylie	10
Little Sugar Creek	226
Long Creek	39
McAlpine Creek	518
Steele Creek	64
<b>Phase II Jurisdictions</b>	
Little Sugar Creek	46
McAlpine Creek	101
McDowell Creek	56
Rocky River	2
Sugar Creek	55
<b>Totals</b>	<b>1,209</b>

Annual Surface Water Clean Up Event - The annual surface water cleanup referred to as the “The Big Spring Clean” was completed on March 26, 2022. This activity along with other volunteer activities is outlined in the Public Involvement Standard Operating Procedures, which is reviewed annually. This year’s review and edits were completed in January 2022.

Table 8 summarizes The Big Spring Clean activities that were conducted in the Phase I and Phase II TMDL watersheds in Charlotte-Mecklenburg during FY2022.

Table 8: The Big Spring Clean Activities Conducted in TMDL Watersheds in FY2022

<b>TMDL Watershed</b>	<b># Miles Cleaned</b>	<b>Lbs. Trash Removed</b>
<b>Phase I Jurisdiction</b>		
Little Sugar Creek	2.81	3,640
Long Creek	2	935
McAlpine Creek	0.18	1,050

TMDL Watershed	# Miles Cleaned	Lbs. Trash Removed
Steele Creek	1.35	2,350
<b>Phase II Jurisdictions</b>		
None		
<b>Totals</b>	<b>6.34</b>	<b>7,975</b>

Volunteer Appreciation - In FY2022, there was no set event for volunteer appreciation due to the growing volunteer numbers and limited budget. Instead, volunteers were recognized in monthly emails, social media posts, and by gifts such as stickers, magnets, t-shirts, and hoodies. Lapel Pins were also given to replace magnets. Of the twelve-monthly volunteer emails sent out during FY22, 11 of them featured a “Volunteer Spotlight.” The January newsletter featured volunteer groups of the year. These groups were offered t-shirts and were given a social media post written about their accomplishments. A total of 68 t-shirts, 447 magnets, 500 stickers, and 725 lapel pins were given out to groups and individuals. All volunteers were offered the appreciation magnet, sticker, or lapel pin as it was included with their supplies or was displayed at the registration table at CMSWS-hosted events. These forms of recognition allow CMSWS to show appreciation to more groups and individuals throughout the year, as opposed to having an event that only a fraction of the volunteers would be able to attend.

During FY2022, the BMPs implemented for the Public Involvement and Participation Program were evaluated and found to be effective at reducing non-point source pollutant loading to the receiving streams of TMDL watersheds to the maximum extent practicable fulfilling the requirements of the Phase II Permit and SWQMPP. Therefore, these BMPs will continue to be used in FY2023 to comply with TMDL requirements.

### 2.2.3 IDDE (Section 11.8.4 of SWQMPP)

The following existing IDDE activities have been identified as suitable for addressing the pollutants of concern in the TMDL watersheds. These BMPs address impaired waters by identifying and eliminating sources of the pollutants of concern. During FY2022, these BMPs were effectively implemented in the Phase I and Phase II jurisdictions in Mecklenburg County.

1. Storm Sewer System Mapping
2. Responding to Citizen Requests for Service
3. Enforcement of Pollution Control Ordinances
4. Conducting Facility Inspections
5. Performing Water Quality Monitoring Activities
6. Implementing the Illicit Discharge Elimination Program (IDEP)
7. Conducting Stream Walks & Dry Weather Flow Investigations

Storm Sewer System Mapping and Dry Weather Flow Investigations - ESRI Arc GIS is used to identify new outfalls and track outfall inspections. In FY2022, written SOPs were reviewed and updated as necessary. Staff were trained in the use of a new GIS layer for performing outfall inspections of existing features, and to add new outfalls while performing inspections using the mobile ESRI Arc GIS. In FY2022, 38 new inlets and 142 new outfalls were added to the CMSWS outfall inventory. Most of the new collections occurred through the Stream Walk program (ID-8). With these additional points, the total current inventory in Phase II

jurisdictions/entities is 8,849 outlets and 53,377 inlets. Data is available to staff through the Cityworks database.

Responding to Citizen Requests for Service - During FY2022, staff responded to 85 service requests regarding potential water quality problems in the Phase II jurisdictions. Fifteen (15) of these service requests were emergency responses. The most common type of service requests involved the discharge and/or dumping of potential surface water/storm water pollutants. The most common pollutants observed were:

- Other = 22
- Sewage = 19
- Petroleum Products = 15

As a result of the 85 service requests responded to, there were a total of 53 problems detected and corrected in Phase II jurisdictions during FY2022. Table 9 below provides data regarding the number and type of service requests received by category in each of the Phase II jurisdictions.

Table 9: Service Requests Responded to by Jurisdiction in FY2022

Jurisdiction	Number of Service Requests by Category								
	Accidental spill	Algae bloom	Discharge / Dump	Erosion / Sediment control	Natural Condition	No incident identified	Other	Unknown	Total
Cornelius	2	3	8		2	1		1	16
Davidson			3		1				4
Huntersville	3		6		3	3	2		17
Matthews	3		6			6	1	1	17
Mecklenburg	5	2	10	1	2	3			23
Mint Hill	2		2			1			5
Pineville	1		1			1			3
<b>Totals</b>	<b>16</b>	<b>5</b>	<b>36</b>	<b>1</b>	<b>8</b>	<b>15</b>	<b>3</b>	<b>1</b>	<b>85</b>

Citizen requests for service are also responded to in the Phase I jurisdictions. Table 10 indicates the number of service requests responded to and the number of inspections conducted in response to these requests in the Phase I and Phase II TMDL watersheds in Charlotte-Mecklenburg during FY2022.

Table 10: Service Requests and Inspections Conducted in TMDL Watersheds in FY2022

TMDL Watershed	# Service Requests	# Inspections
<b>Phase I Jurisdiction</b>		
Irwin Creek	49	50
Lake Wylie	27	49

TMDL Watershed	# Service Requests	# Inspections
Little Sugar Creek	149	149
Long Creek	13	15
McAlpine Creek	122	176
McKee Creek	1	1
Steele Creek	18	18
Sugar Creek	31	35
<b>Phase II Jurisdictions</b>		
Goose Creek	4	7
McDowell Creek	17	43
Rocky River	4	6
<b>Totals</b>	<b>435</b>	<b>549</b>

Enforcement of Pollution Control Ordinances – During FY2022, Notice of Violation (NOV) protocols, procedures and templates were reviewed and updated as needed. The applicable ordinances, notice of violation and enforcement decision-making processes, and penalty/enforcement guidance were also reviewed, and updated as needed. During FY2022, a total of 23 written NOV's were issued in the Phase II jurisdictions as follows: Cornelius – 7; Davidson – 0; Huntersville – 4; Matthews – 4; Mecklenburg County – 6; Mint Hill – 1; and Pineville – 1. The types of NOV's and/or the materials released were as follows: cooking oil/grease – 2; motor oil – 1; paint – 1; sediment – 1; sewage – 12; wash water – 3; other – 2; unknown - 1. All violations were corrected and remediated as necessary. One (1) NOV with a civil penalty was issued for the illicit discharge of sewage in Mecklenburg County.

NOV's were also issued in the Phase I jurisdiction during FY2022. Table 11 indicates the number of NOV's with and without penalties in the Phase I and Phase II TMDL watersheds in Charlotte-Mecklenburg during FY2022.

Table 11: NOV's and Penalties Issued in TMDL Watersheds in FY2022

TMDL Watershed	NOV- No Penalty	NOV - Penalty
<b>Phase I Jurisdiction</b>		
Irwin Creek	21	1
Lake Wylie	4	0
Little Sugar Creek	42	5
Long Creek	1	0
McAlpine Creek	31	0
Steele Creek	7	0
Sugar Creek	8	0
<b>Phase II Jurisdictions</b>		
Goose Creek	1	0
McDowell Creek	8	0
<b>Totals</b>	<b>123</b>	<b>6</b>



**Facility Inspections** - During FY2022, 41 inspections were performed at privately owned and operated facilities that have the potential to negatively impact storm water quality in both the Phase I and Phase II jurisdictions resulting in the elimination of one illicit discharge. Table 12 indicates the type and number of facilities inspected, number of inspections conducted, and number of discharges eliminated in the Phase I and Phase II TMDL watersheds in Charlotte-Mecklenburg during FY2022.

Table 12: Inspections Conducted at Private Facilities in TMDL Watersheds in FY2022

TMDL Watershed	Industrial Facilities		Vehicle Maintenance Facilities		Machine Shops		Discharges Eliminated
	# Facilities	# Inspections	# Facilities	# Inspections	# Facilities	# Inspections	
Phase I Jurisdiction							
Irwin Creek	6	6	8	8	0	0	0
Lake Wylie	3	3	0	0	0	0	0
Little Sugar Creek	5	5	11	11	0	0	0
Long Creek	7	7	0	0	0	0	0
McAlpine Creek	1	1	0	0	0	0	0
McKee Creek	0	0	1	1			
Steele Creek	7	7	0	0	0	0	0
Sugar Creek	4	5	0	0	0	0	1
Phase II Jurisdictions							
Long Creek	2	2	0	0	0	0	0
McAlpine Creek	2	2	0	0	0	0	0
McDowell Creek	2	2	1	1	0	0	0
Sugar Creek	1	1	0	0	0	0	0
Totals	40	41	21	21	0	0	1

The Mecklenburg County Solid Waste website contains information about facilities that accept used oil and household hazardous wastes (HHWs). The link is as follows:  
<https://www.mecknc.gov/LUESA/SolidWaste/Disposal-Recycling/Pages/Household-Hazardous-Waste.aspx>

Industrial monitoring was performed in the Phase I jurisdiction at 8 industrial facilities in the TMDL watersheds as indicated in Table 13.

Table 13: Industrial Monitoring in Phase I TMDL Watersheds in FY2022

TMDL Watersheds	Totals
Irwin Creek	1
Little Sugar Creek	3
Long Creek	1
Steele Creek	2
Sugar Creek	1

TMDL Watersheds	Totals
<b>Totals</b>	<b>8</b>

Routine Water Quality Monitoring Activities - In FY2022 CMSWS conducted continuous automated monitoring activities at 7 sites in the Phase II jurisdictions resulting in the collection of 377,041 QA/QC accepted data points (~85% data acceptance rate). Sensors were used to collect the following water quality parameters: conductivity, oxygen, pH, temperature, and turbidity. All data collected was evaluated for the identification of potential pollution problems and general water quality trends. Current data can be observed on the following website: <http://cmann.mecknc.gov>. CMANN data is used to help calculate the Stream Use Support Index (SUSI), which is a general indicator of water quality conditions in local streams. This index was made available to the public on the website as follows: <http://stormwater.charmeck.org> (select “Water Quality” at the top of the page).

The Phase II sites include MC4 – McDowell Creek (Huntersville), MC40D – Four Mile Creek (Matthews), MC50 – Gar Creek (Huntersville), MY1B – West Branch Rocky River (Davidson), MY8 – Clear Creek (Mint Hill), MY9 – Goose Creek (Mint Hill), MY10 – Clarke Creek (Huntersville). In fiscal year 2022, CMSWS CMANN equipment did not observe or detect any pollution problems in the Phase 2 jurisdictions.

CMANN monitoring is also conducted in the Phase I jurisdictions. Table 14 indicates the number of CMANN water quality measurements in the Phase I and Phase II TMDL watersheds in Charlotte-Mecklenburg during FY2022.

Table 14: CMANN Water Quality Measurements in TMDL Watersheds in FY2022

TMDL Watershed	CMANN Monitoring Site(s)	# Oxygen Measurements	# Turbidity Measurements
<b>Phase I Jurisdiction</b>			
Irwin Creek	MC22A	28,333	24,999
Lake Wylie	MC66	7,111	9,080
Little Sugar Creek	MC29A1, MC30A, MC33, MC49A, Mobile 1	79,045	61,969
Long Creek	MC14A	6,176	6,237
McAlpine Creek	MC38, MC40A, MC40D, MC42, MC45	42,639	31,616
McKee Creek	MY7B	5,978	5,703
Steele Creek	MC47A	6,119	7,669
Sugar Creek	MC25, MC27	31,284	28,056
<b>Phase II Jurisdictions</b>			
Goose Creek	MY9	21,924	17,788
McDowell Creek	MC4, MC5	12,051	11,312
Rocky River	MY1B	5,016	4,454
<b>Totals</b>		<b>245,676</b>	<b>208,883</b>

During FY2022, Fixed Interval Monitoring was conducted monthly at 10 sites throughout the Phase II jurisdictions. All sites were typically sampled on the 2<sup>nd</sup> or 3<sup>rd</sup> Tuesday of every month. At each site, samples were collected and analyzed for 16 water quality parameters as follows: ammonia-nitrogen, fecal coliform bacteria, total Kjeldahl nitrogen, nitrate/nitrite, total suspended solids, total phosphorus, E. coli, turbidity, suspended sediment concentration, magnesium, calcium, hardness, and copper (dissolved). Lead (dissolved), chromium (total), and zinc (dissolved) were collected in the first month of each quarter. There was a total of 13 action level exceedances and 45 watch level exceedances during baseflow conditions. Action level exceedances comprised of fecal coliform (4), total phosphorus (6), copper (1), and turbidity (2). Bacteria exceedances occurred at MC2, MC40C, MY10, and MY1B while total phosphorus exceeded threshold at MY10 (1) and MY14 (5). A copper and turbidity exceedance were observed at MY10. Turbidity was also elevated at MC36 on one occasion. Ongoing greenway and roadway construction continues to occur upstream of site MC40C resulting in increased instream sedimentation and the associated pollutants. Exceedances of copper and total phosphorus at MY10 have been attributed to a permitted discharge at Metrolina Greenhouses which is located upstream of this monitoring site. Staff are working with NCDEQ to reduce pollutant loading from this facility. Exceedances of total phosphorus at MY14 are associated with a package wastewater treatment facility located upstream. Table 15 below identifies the Baseflow Action and Watch level exceedances identified through Fixed Interval Monitoring performed in the Phase II jurisdictions during FY2022.

Table 15: Baseflow Exceedances in TMDL Watersheds in FY2022

TMDL Watershed	Site	Exceedances	Discharges Eliminated
<b>Phase I Jurisdiction</b>			
Irwin Creek	MC22A	5	0
Lake Wylie	MC66	7	0
Little Sugar Creek	MC49A, MC29A1, MC33, MC30A	28	0
Long Creek	MC14A	5	0
McAlpine Creek	MC45B, MC45, MC42, MC40A, MC38	32	0
McKee Creek	MY7B	7	0
Steele Creek	MC47A	13	0
Sugar Creek	MC27, MC25	22	0
<b>Phase II Jurisdictions</b>			
Goose Creek	MY9, MY14	17	0
McDowell Creek	MC2, MC4,	6	0
Rocky River	MY1B	4	0
McAlpine Creek	MC36, MC40C	13	0
<b>Totals</b>		<b>159</b>	<b>0</b>

Illicit Discharge Elimination Program (IDEP) – The purpose of the Illicit Discharge Elimination Program (IDEP) program, formerly known as ISIS, is to support and enhance Illicit Discharge Detection and Elimination (IDDE) efforts in Mecklenburg County. The identification of pollution sources is accomplished by qualitative and quantitative measurements. Such measures include field investigations, monitoring storm water outfalls, business corridor inspections, multi-family private sewer system inspections, and inspection of all outfalls that drain directly to Mecklenburg County’s three reservoirs. In FY22, CMSWS reviewed NOV data to determine which businesses/properties have had repeat violations within the previous three (3) fiscal years within the Phase II jurisdiction. A total of 11 businesses/properties were identified for re-inspection. Penalty re-inspections were initiated in December 2021 and completed in March 2022. No violations of the stormwater ordinance were observed during the re-inspections of the 11 sites. A summary of the sites in relation to municipality is shown below:

- Cornelius (2)
- Davidson (1)
- Matthews (2)
- Mecklenburg County Unincorporated (1)
- Mint Hill (1)
- Pineville (3)

Watershed/business corridor areas were determined by reviewing data from the previous five (5) fiscal years for service requests, NOVs, and watersheds with TMDL impairments.

Watershed/business corridor inspections can involve inspecting a multitude of commercial businesses. These businesses can include – but not limited to – food services, single-family residential, multi-family residential facilities, and industrial facilities. In FY2022, a total of ten (10) watershed/business corridor inspections were completed within the Phase II jurisdiction. A summary of the inspections per town is listed below:

- Cornelius (2)
- Davidson (1)
- Huntersville (4)
- Matthews (1)
- Mint Hill (1)
- Pineville (1)

Out of the ten (10) watershed/business corridor inspections, three (3) requests for service were generated for food service businesses within the Phase II jurisdiction. Of the three (3) generated request for service, three (3) NOVs were issued, one for each request. All the requests involved improper storage, handling, or processing of cooking oil/grease and were resolved in 2022. No samples were collected under this program element within the Phase II jurisdiction.

In the Phase II jurisdiction, 4 outfalls were inspected in FY22 outside of the Stream Walk program (ID-8). They were conducted under Service Request and IDEP programs. No illicit discharges were detected, and no samples were collected.

Stream Walks – During FY2022, the Phase II Stream Walk program was coordinated in conjunction with the Phase I program for the City of Charlotte. Policies and procedures for this program were reviewed and were concluded to be in good standing. Miles walked in the extraterritorial jurisdiction (ETJ) within Phase I six-mile basins were counted towards the Phase

II program. Staff training was performed on October 20, 2021. Stream walks began on November 1, 2021 and concluded on April 25, 2022. Staff walked approximately 127.7 stream miles in the Phase II areas (71.38 miles within Phase II basins and 54.32 miles in Phase I ETJ). In all, 179 data points were collected in FY2022, including 46 new features and 133 outfall inspections. There were 65 new outfalls recorded, 68 existing outfalls inspected, and 5 dry weather flows (DWFs) identified. There were no samples collected from the DWFs because they were either too low to sample or draining from a SCM. Three (3) significant problems and 11 stream blockages were identified and reported to Charlotte-Mecklenburg Stormwater Services Operations Department. Staff also identified six (6) potential stream buffer violations, two (2) dry channels, six (6) private arials, three (3) reference reaches, four (4) instances of severe bank erosion, and two (2) new wetland areas. Six (6) beaver dams were recorded, and the data was reported to Charlotte-Mecklenburg Stormwater Operations to track. One (1) illicit discharge pollution source was observed which resulted in a NOV being issued. Staff reviewed all monitoring data generated under this program. Overall, Stream Walk data was collected with consistency throughout all teams in the FY2022 season. Stream Walk activities are also performed in the Phase I jurisdiction. Figure 2 identifies the basins that were walked during FY2022 in the Phase I and Phase II jurisdictions. Table 16 summarizes the stream walk data collected in the TMDL watersheds.

Table 16: Stream Walk Data Collected in Phase I and Phase II TMDL Watersheds in FY2022

<b>TMDL Watershed</b>	<b>Stream Miles</b>	<b>Outfalls Inspected</b>	<b>DWFs Detected</b>	<b>DWFs Sampled</b>	<b>IDDE Problems Corrected</b>
<b>Phase I Jurisdiction</b>					
Irwin Creek	3.82	9	0	0	0
Lake Wylie	42.98	79	5	0	1
Little Sugar Creek	58.43	257	16	6	6
Long Creek	6.59	8	5	0	1
Steele Creek	27.41	104	6	1	1
<b>Phase II Jurisdictions</b>					
Goose Creek	7.54	16	1	0	0
McAlpine Creek	35.69	90	1	0	4
McDowell Creek	15.58	12	1	0	0
<b>Totals</b>	<b>198.04</b>	<b>575</b>	<b>35</b>	<b>7</b>	<b>13</b>

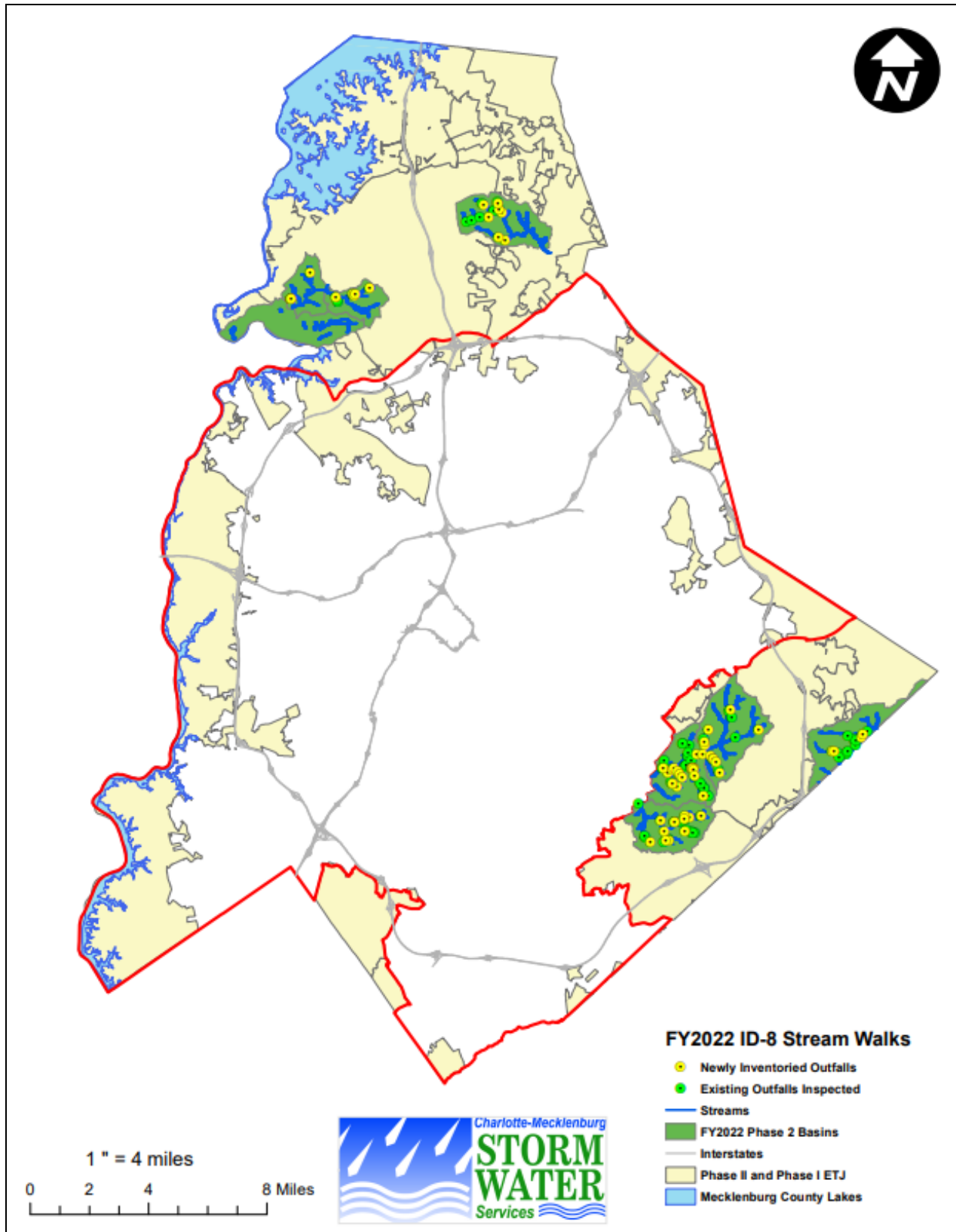


Figure 2: FY2022 Stream Walk Basins in Phase I and Phase II



In FY2022, IDDE training was provided to appropriate municipal staff, who, as part of their normal job responsibilities, may encounter or otherwise observe an illicit discharge or illicit connection to the storm sewer system. This IDDE training is separate from the annual Pollution Prevention and Good Housekeeping training provided to employees at facilities involved in municipal operations. According to the Storm Water Quality Management Program Plan, IDDE training is to be completed at least once during every five Permit cycles. CMSWS utilized a 2½ minute video entitled “Water Pollution: What To Do” to provide the IDDE training to appropriate staff. The video was made available in the MeckEDU online training platform and was forwarded to the following county departments: Department of Social Services, Code Enforcement, Solid Waste, and the Sheriff’s Office.

During FY2022, the BMPs implemented for the Illicit Discharge Detection and Elimination Program were evaluated and found to be effective at reducing non-point source pollutant loading to the receiving streams of TMDL watersheds. Therefore, these BMPs will continue to be used in FY2023 to comply with TMDL requirements.

#### 2.2.4 Charlotte Water Program

The City’s water and sewer utility department (Charlotte Water) maintains a public education program focused on keeping food related fats, oils, and grease from being discharged to the sanitary sewer system in the Phase I and Phase II jurisdictions. In recent years, the focus of this program has been expanded to include wipes and paper towels that can be flushed down the toilet. The program is referred to as “Flow Free.” This effort helps to reduce clogging and blockages in the system and prevent SSOs, which can introduce fecal coliform and other pollutants to water bodies. The program has proven to be effective and will continue to be implemented in FY2023.

#### 2.2.5 Sewer Use Ordinance

Implementation and enforcement of the Sewer Use Ordinance by Charlotte Water in the Phase I and Phase II jurisdictions provides the legal mechanism to ensure proper use and connection to the sanitary sewer system and correction of problems and illegal practices. Ensuring that the system is used properly will help prevent leaks and overflows as well as upsets at wastewater treatment plants thus helping control the TMDL pollutants of concern. This ordinance has proven to be effective and will continue to be implemented in FY2023.

#### 2.2.6 Sanitary Sewer System Inspections and Maintenance

Charlotte Water conducts inspections and maintenance of various components of the sanitary sewer system in the Phase I and Phase II jurisdictions to ensure proper operating function and prevent leaks and overflows. These include food service grease trap inspections, commercial oil/water separator inspections, sanitary sewer line root control and cleaning, sewer line right-of-way clearing and maintenance, and lift station inspection and maintenance. Ensuring that the system is used properly, inspected, and maintained helps prevent leaks and overflows as well as upsets at wastewater treatment plants thus helping control the TMDL pollutants of concern. These inspection and maintenance efforts have proven to be effective and will continue to be implemented in FY2023.



### 2.2.7 SSO Rapid Response

Charlotte Water maintains a rapid response program designed to quickly and efficiently respond to sanitary sewer overflows, thus reducing the discharge of pollutants to the MEP and helping control the TMDL pollutants of concern in the Phase I and Phase II jurisdictions. These programs have proven to be effective and will continue to be implemented in FY2023.

### 2.2.8 Construction Site Storm Water Runoff Control (Section 11.8.7 of SWQMPP)

The following existing construction site storm water runoff control activities have been identified as suitable for addressing the pollutants of concern in the TMDL watersheds. These BMPs address impaired waters by reducing discharges of pollutants of concern from construction sites. During FY2022, these BMPs were effectively implemented in the TMDL watersheds in Charlotte-Mecklenburg.

1. Erosion Control Plan Reviews
2. Erosion Control Inspections
3. Enforcement of Erosion Control Ordinance – Enhanced erosion control measures are required in all TMDL watersheds.
4. Erosion Control Hotline
5. Erosion Control Education
6. Erosion Control at Government Projects

During FY2022, a total of 215 new projects were approved in Mecklenburg County with a total of 1,656.54 acres disturbed. In all, 1,549 inspections were performed with 17 Notice of Violations (NOVs) issued. Four penalties were assessed for a total of \$14,000.00. All of the penalties assessed have been collected in full. There are no outstanding penalties and no penalties have been submitted to the state for remission. Provided below are the totals for the Phase II jurisdictions.

- Huntersville: 811 inspections conducted; 7 NOVs issued.
- Cornelius: 104 inspections conducted; 2 NOV issued.
- Davidson: 49 inspections conducted; 2 NOV issued.
- Matthews: 166 inspections conducted; 2 NOVs issued.
- Mint Hill: 296 inspections conducted; 2 NOVs issued.
- Pineville: 89 inspections conducted; 2 NOVs issued.
- Mecklenburg County: 34 inspections conducted; 0 NOVs issued.

Erosion control educational programs were only offered virtually in FY2022 due to COVID-19 restrictions. In all, 312 individuals were certified for the Charlotte-Mecklenburg Certified Site Inspector (CMSCI) program.

During FY2022, an evaluation was completed of the effectiveness of the BMPs for the Construction Site Storm Water Control Program as described in the latest version of the Storm Water Plan. The evaluation revealed that the Program is successful at addressing the discharges of sediment and other pollutants from construction sites in Phase II jurisdictions. Four (4) improvements are recommended for Mecklenburg County staff and three (3) improvements are

recommended for the Town of Huntersville staff for implementation in FY2023 based on this evaluation:

1. Mecklenburg County - Evaluate the usage of drones for site inspections.
2. Mecklenburg County - Continue working on changing all Erosion Control Ordinances to meet the new State model ordinance and update the Enhanced Measures.
3. Mecklenburg County - Develop a plan for cross-training through ride along with the City of Charlotte and the Town of Huntersville.
4. Mecklenburg County - Look into creating interactive hands-on training components to CMCSI. Will need to have buy in from the City of Charlotte and the Town of Huntersville.
5. Town of Huntersville - Work on updating the Town's Engineering Standards as they pertain to erosion measures and BMPs
6. Town of Huntersville - Continue to review and update the Town's Sediment and Erosion Control Ordinance as needed.
7. Town of Huntersville - Train Planning staff to ensure erosion measure installation expectations are being communicated to single family home (<1 acre) building permit applicants.

There is one (1) measure of success for the Program contained in the Storm Water Plan, including the documentation of the completion of activities that demonstrate the successful completion of the BMPs associated with the Program and the number of NOVs issued for every 100 inspections. The evaluation revealed that all documentation was successfully completed. The results of the evaluation for the past ten (10) years of NOV and inspection data are reported in Figure 3 below. Data shows that the ratio of the number of violations issued to the number of inspections conducted has decreased slightly. The desired trend is a reduction of this ratio, which would indicate fewer violations being detected, as a result of better compliance from the developing community.

#### 2.2.9 Post-Construction Site Runoff Control (Section 11.8.9 of SWQMPP)

The following existing post-construction site runoff control activities have been identified as suitable for addressing the pollutants of concern in the TMDL watersheds. These BMPs address impaired waters by reducing discharges of pollutants of concern from new development and redevelopment projects. During FY2022, these BMPs were effectively implemented in the Phase I and Phase II jurisdictions in Mecklenburg County.

1. Enforcement of the Post-Construction Storm Water Ordinances
2. Compliance by Co-Permittees with Post-Construction Ordinance Requirements
3. Ensuring Compliance with Requirements for Non-Structural BMPs
4. Ensuring Compliance with Requirements for Structural BMPs
5. Ensuring Compliance with Natural Resource Protection
6. Ensuring Compliance with Open Space Protection
7. Ensuring Compliance with Tree Preservation
8. Ensuring Compliance with Redevelopment
9. Ensuring Compliance with Green Infrastructure Practices
10. Ensuring Compliance with Operation and Maintenance Requirements

During FY2022, a total of 763 BMP inspections were completed revealing 260 deficiencies. Table 17 below summarizes these inspections by Phase II jurisdiction.

Table 17: Summary of FY2022 BMP Inspections by Jurisdiction

Jurisdiction	# Inspections/ Follow Up Insp.	Non-Compliant BMPs	# BMPs brought into compliance	Notice of Maintenance	# Correction Action Requests Issued	# Notices of Violation Issued
Cornelius	56/0	5	0	1	0	0
Davidson	46/1	3	1	7	0	0
Huntersville	401/13	97	14	70	0	0
Matthews	45/5	15	2	27	1	2
Mint Hill	36/2	6	2	16	2	2
Pineville	15/2	2	2	6	1	2
CMS	145/1	120	1	3	108	0
CPCC	19/0	12	0	11	0	0
<b>TOTALS</b>	<b>763/24</b>	<b>260</b>	<b>22</b>	<b>141</b>	<b>112</b>	<b>6</b>

During FY2022, the post-construction ordinances applicable to the Phase II jurisdictions were evaluated and found to be effective at fulfilling the requirements of the Phase II Permit and SWQMPP. The BMPs implemented for the Post-Construction Site Runoff Control Program were also evaluated and found to be effective at reducing non-point source pollutant loading to the receiving streams of TMDL watersheds. However, the following improvements to the Post-Construction Site Runoff Control Program have been identified for implementation in FY2022 to further improve program effectiveness:

1. Develop a process to better identify when BMPs need to be inspected based on the Ordinance for which they were installed and work with field staff to check for 3<sup>rd</sup> party inspections and issue NOVs if they are not being submitted
2. Work with the Towns to determine if Watershed Ordinances can be changed so that the BMPs would only have to be inspected every 3 to 5 years. (Water Quality would work on this task with help from Permitting and Compliance).
3. Determine if an Environmental Specialist III, or similar position, is needed to manage the BMP inspection program. Currently, the program takes a significant amount of time for the Environmental Supervisor to perform, taking time away from other needed job duties. Since the number of BMPs increases every year, resource allocation needs to be periodically examined.

#### 2.2.10 Pollution Prevention and Good Housekeeping (Section 11.8.10 of SWQMPP)

The following existing pollution prevention and good housekeeping activities for municipally owned/operated facilities have been identified as suitable for addressing the pollutants of concern in the TMDL watersheds. These BMPs address impaired waters by reducing discharges of pollutants of concern from municipal facilities and operations. During FY2022, these BMPs were effectively implemented in the Phase I and Phase II jurisdictions in Mecklenburg County.

1. Maintaining an Inventory of Municipal Operations
2. Providing Employee Training

3. Implementing Operation and Maintenance Programs, Spill Prevention and Spill Response
4. Minimizing Pollution from Municipally Owned Streets, Roads and Parking Lots
5. Implementing Operation and Maintenance of Municipally Owned Storm Sewer System
6. Management of Pesticide, Herbicide and Fertilizer Application
7. Preventing or Minimizing Pollution from Vehicle and Equipment Cleaning Areas
8. Implementing Proper Waste Disposal Practices
9. Completing Flood Management Projects

During FY2022, CMSWS staff inspected 52 municipal owned/operated facilities in the Phase II jurisdictions. A total of two (2) deficiencies were identified as a result of these inspections. One of the deficiencies was for failure to conduct semi-annual inspections, and the other one was for failure to update the site map. All Stormwater Pollution Prevention Plans (SWPPPs) were reviewed and updated by CMSWS staff to reflect any changes in the previous year, and updated copies were sent to facility managers.

Municipal facility inspections are also performed in the Phase I jurisdiction. Table 18 indicates the number of municipal facility inspections conducted in the Phase I and Phase II TMDL watersheds in Charlotte-Mecklenburg during FY2022.

Table 18: Municipal Facility Inspections Conducted in Phase II TMDL Watersheds in FY2022

TMDL Watershed	# Municipal Facilities Inspected	# Inspections Conducted
<b>Phase I Jurisdiction</b>		
Irwin Creek	10	10
Lake Wylie	1	1
Little Sugar Creek	8	8
Long Creek	2	2
McAlpine Creek	9	9
McDowell	2	2
McKee	1	1
Steele Creek	1	1
Sugar Creek	8	8
<b>Phase II Jurisdictions</b>		
Long Creek	2	2
McAlpine Creek	2	2
McDowell Creek	2	2
Sugar Creek	3	3
<b>Totals</b>	<b>51</b>	<b>51</b>

During FY2022, the BMPs implemented for the Pollution Prevention and Good Housekeeping Program were evaluated and found to be effective at reducing non-point source pollutant loading to the receiving streams of TMDL watersheds to the maximum extent practicable. Therefore, these BMPs will continue to be used in FY2023 to comply with TMDL requirements.

### Section 3: Current TMDL Monitoring Strategies

CMSWS conducts fixed interval stream monitoring every month at 33 locations across the county (see Figure 3) in the Phase I and Phase II jurisdictions. Many of these locations are within, or immediately downstream of, the TMDL watersheds that are shown in Figure 1. At each site, samples are collected and analyzed for 16 water quality parameters as follows: ammonia-nitrogen, fecal coliform bacteria, total Kjeldahl nitrogen, nitrate/nitrite, total suspended solids, total phosphorus, E. coli, turbidity, suspended sediment, magnesium, calcium, hardness, and copper (dissolved). Lead (dissolved), chromium (total), and zinc (dissolved) are collected in the first month of each quarter. CMSWS also performs annual or bi-annual monitoring for benthic macroinvertebrates in the Phase I and Phase II jurisdictions at these 33 stream monitoring locations. CMSWS maintains a Continuous Monitoring and Alert Notification Network or CMANN at 34 locations, including 27 of the fixed interval monitoring locations shown in Figure 3. The CMANN network collects data hourly for turbidity, dissolved oxygen, temperature, conductivity, and pH. CMSWS conducts routine lake monitoring at 27 locations on Lake Norman, Mountain Island Lake and Lake Wylie, including seven locations in the TMDL area identified in Figure 1 for Lake Wylie. This monitoring is performed every other month for the following 12 parameters: secchi depth, temperature, dissolved oxygen, conductivity, pH, fecal coliform bacteria, ammonia nitrogen, nitrate + nitrite, total Kjeldahl nitrogen, total phosphorus, turbidity, and Chlorophyll-a. Monitoring for the following 11 parameters is performed twice a year: copper, chromium, lead, zinc, mercury, manganese, arsenic, cadmium, nickel, selenium, and iron. Additionally, semi-annual monitoring is performed at 10 locations in eight coves on Lake Wylie to monitor potential impacts associated with a long-term residential development project. These semi-annual samples are analyzed for the same 12 parameters measured during bi-monthly routine monitoring. All monitoring results that exceed threshold values are referred for follow-up under the Illicit Discharge Detection and Elimination (IDDE) Program. Long-term assessment for trends is performed on a non-fixed frequency (as needed). Provided below is an assessment of the data collected for the identified parameters in the three TMDL watersheds where Mecklenburg County is assigned as the lead, including the Rocky River and Goose Creek impaired for fecal coliform bacteria and Lake Wylie impaired for nutrients (see Table 1). The following discussion is limited to data collected up to the end of 2021 as the Federal TMDL Program operates on a calendar year basis as opposed to the fiscal year basis utilized by CMSWS.



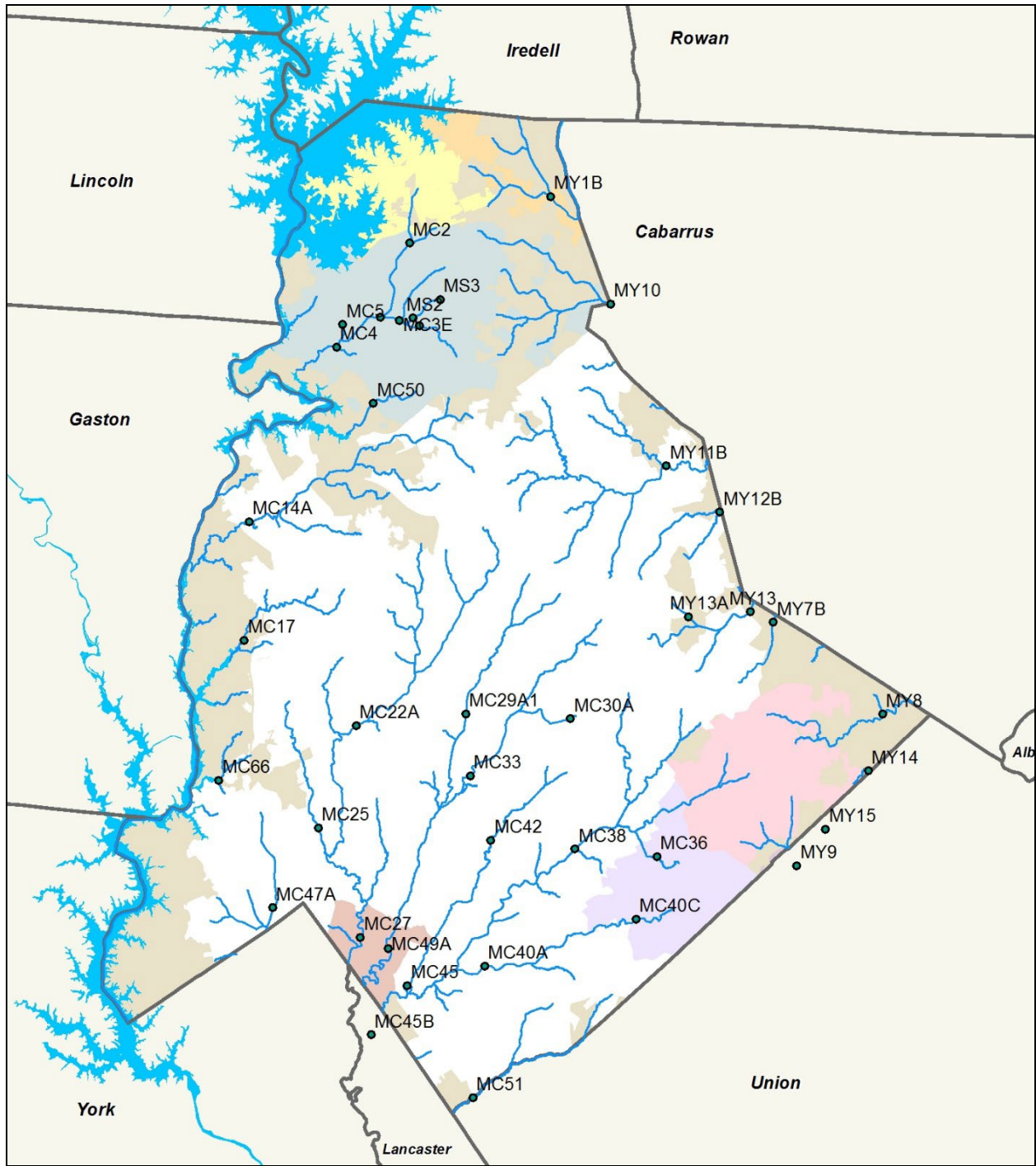


Figure 3: Water Quality Monitoring Locations in Mecklenburg County

### 3.1 Rocky River Fecal Coliform Monitoring and Land Use Evaluation

As identified in Table 19, a section of the Rocky River in Mecklenburg County (AU Number 13-17a) is subject to a fecal coliform TMDL with a WLA assigned to storm water that was approved on September 19, 2002. According to the Draft NC 2022 305(b) report, the Rocky River is

currently not meeting the fecal coliform criteria. Mecklenburg County has been assigned responsibility for this TMDL on behalf of the Phase I and Phase II jurisdictions in Charlotte-Mecklenburg. Phase II Permit conditions required that a monitoring plan be developed for the Fecal Coliform TMDL in the Rocky River Watershed unless a waiver is obtained from NCDEQ. Such a waiver was obtained on June 26, 2014, based on the condition that Mecklenburg County continue to evaluate the land use and development within the watershed on an annual basis and if additional storm water infrastructure is installed or higher intensity land uses are constructed a Monitoring Plan would be reconsidered. In response to this condition, CMSWS has obtained impervious area and land use data from the County GIS Department back to 2011 and continues to update this data annually (see Table 1). Between 2020 and 2021, the residential impervious cover increased 0.31 acres to a total of 16.03 acres. However, the commercial impervious cover remained unchanged at 0.33 acres during the same time. The total amount of impervious cover in the watershed (residential + commercial) is now approximately 16.36 acres. Compared to the total area of the watershed at 747 acres, the amount of impervious cover is at 2.19%, which is an increase of 0.24 percentage points since 2011. The number of outfalls is unchanged from 2020 at four (4), which has increased by three (3) outfalls since 2011. To date, changes in the watershed are not significant enough to warrant the establishment of a Monitoring Plan.

Table 19: Annual Analysis of the Rocky River Watershed for the Monitoring Plan

Year	Residential Impervious Cover (acres)	Commercial Impervious Cover (acres)	Total Impervious Cover (acres)	Storm Water Outfalls (number)
2011	14.22	0.33	14.55	1
2012	14.22	0.33	14.55	1
2013	14.55	0.33	14.88	3
2014	14.88	0.33	15.21	3
2015	15	0.33	15.33	4
2016	15.1	0.33	15.43	4
2017	15.2	0.33	15.53	4
2018	15.69	0.33	16.02	4
2019	15.72	0.33	16.05	4
2020	15.72	0.33	16.05	4
2021	16.03	0.33	16.36	4
# Increase from 2011	1.81	0.00	1.81	3
% Increase from 2011	12.73%	0.00%	12.44%	300%

Although CMSWS does not perform monitoring in the Rocky River TMDL watershed, it obtains monthly monitoring data collected by the NCDEQ, Division of Water Quality at Q7330000, which is the specific monitoring location for this TMDL. CMSWS performed analysis of the fecal coliform data collected by the State in calendar year 2021, which is the most current data available. The geometric mean concentration of fecal coliform samples collected in 2021 was 491.22 CFU/100 ml. This represents an approximately 13.6% increase from the geometric mean concentration (432.40 CFU/100 ml) observed in calendar year 2020. Out of the 12 samples



collected in 2021, seven (58%) exhibited concentrations below 400 CFU/100 ml. The remaining five samples (42%) exceeded the 400 CFU/100 ml threshold. The North Carolina Administrative Code (NCAC) 02B Fresh Surface Water Quality Standards dictate that fecal coliform “shall not exceed a geometric mean of 200 [CFU]/100 ml...nor exceed 400 [CFU]/100 ml in more than 20 percent of the samples examined...”. The data from site Q7330000 suggest a slight increase in mean fecal coliform concentration from 2020 to 2021. However, mean fecal coliform concentrations and compliance percentages have improved overall since the 1970s (Table 20, Figure 4, and Figure 5).

Table 20: NCDWQ Fecal Coliform Data for Site Q7330000 on the Rocky River

Year	Geometric Mean	# Compliant	# Non-Compliant	Total Samples	% Compliant	% Non-Compliant
2017	488.70	5	7	12	42%	58%
2018	663.46	5	7	12	42%	58%
2019	357.17	8	4	12	67%	33%
2020	432.40	3	3	6	50%	50%
2021	491.22	7	5	12	58%	42%

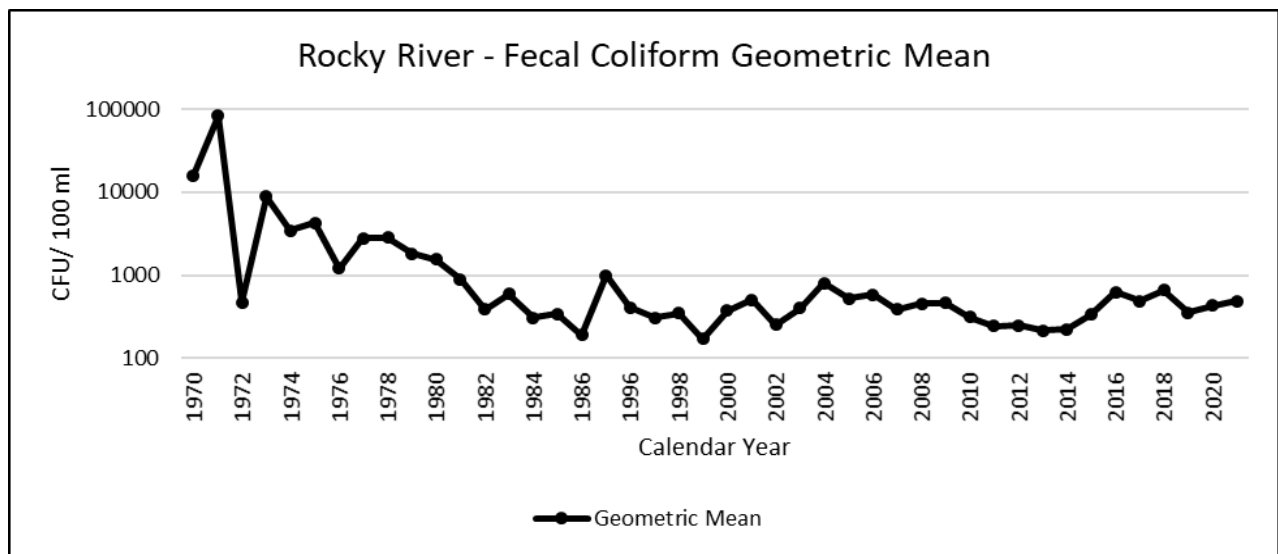


Figure 4: Geometric Mean for Fecal Coliform on Rocky River Site Q7330000

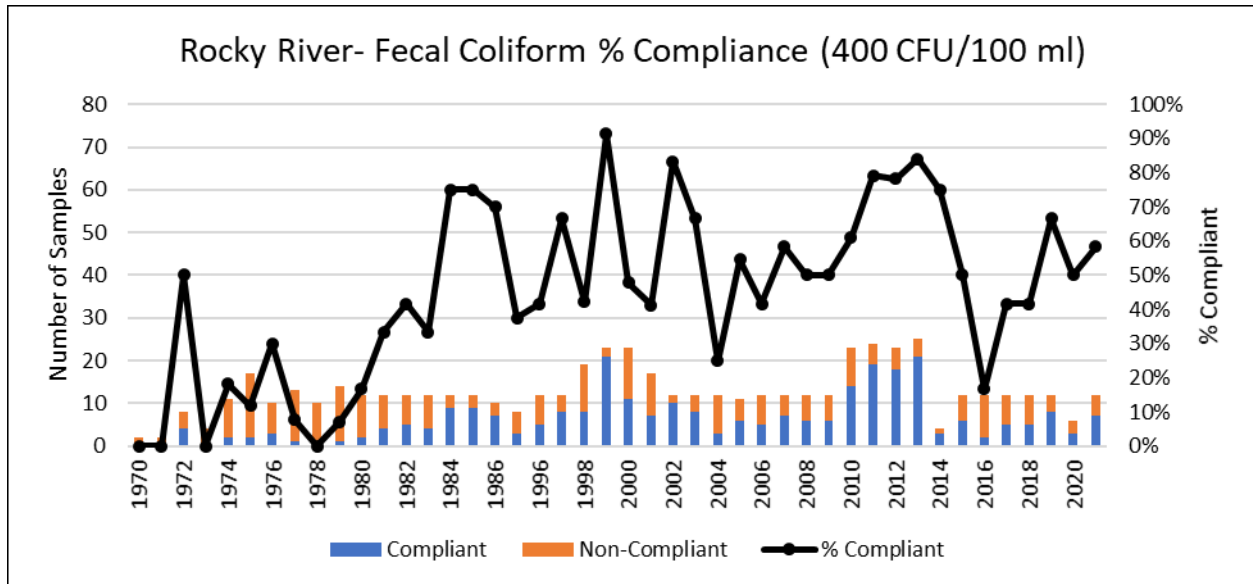


Figure 5: Compliance with Fecal Coliform Standard on Rocky River Site Q7330000

### 3.2 Goose Creek Fecal Coliform Monitoring

As identified in Table 1, two (2) sections of Goose Creek in Mecklenburg County (AU Numbers 13-17-18a and 13-17-18b) are subject to a fecal coliform TMDL with a WLA assigned to storm water that was approved on July 8, 2005. According to the Draft NC 2022 305(b) report, fecal coliform concentrations in Goose Creek are currently not meeting state water quality standards. Mecklenburg County has been assigned responsibility for compliance with this TMDL on behalf of the Phase I and Phase II jurisdictions in Charlotte-Mecklenburg. CMSWS maintains a fixed interval monitoring site (MY9) located where Stevens Mill Road crosses Goose Creek in Union County. In calendar year 2021, fecal coliform counts at this station ranged from 154 Colony-Forming Units per 100 milliliters of water (CFU/100 ml) to 1,630 CFU/100 ml with a geometric mean of 513.89 CFU/ 100 ml. Eight of the 15 samples collected in 2021 (44%) exhibited concentrations at or below 400 CFU/100 ml. The remaining 10 samples (56%) exhibited concentrations above this threshold. No pollution sources were identified as a result of the water quality monitoring in the Goose Creek TMDL watershed in 2021. Table 21 provides a summary of this data from 2017 through 2021. Figures 6 and 7 provide a comparison of fecal coliform data indicating overall improvements in mean fecal coliform concentrations and compliance percentages since the mid-2000s.

Table 21: CMSWS Fecal Coliform Data for Site # MY9 on the Goose Creek

Year	Geometric Mean	# Compliant	# Non-Compliant	Total Samples	% Compliant	% Non-Compliant
2017	607.12	10	9	19	53%	47%
2018	678.67	11	8	19	58%	42%
2019	427.19	11	8	19	58%	42%
2020	404.11	8	7	15	53%	47%
2021	513.89	8	10	18	44%	56%

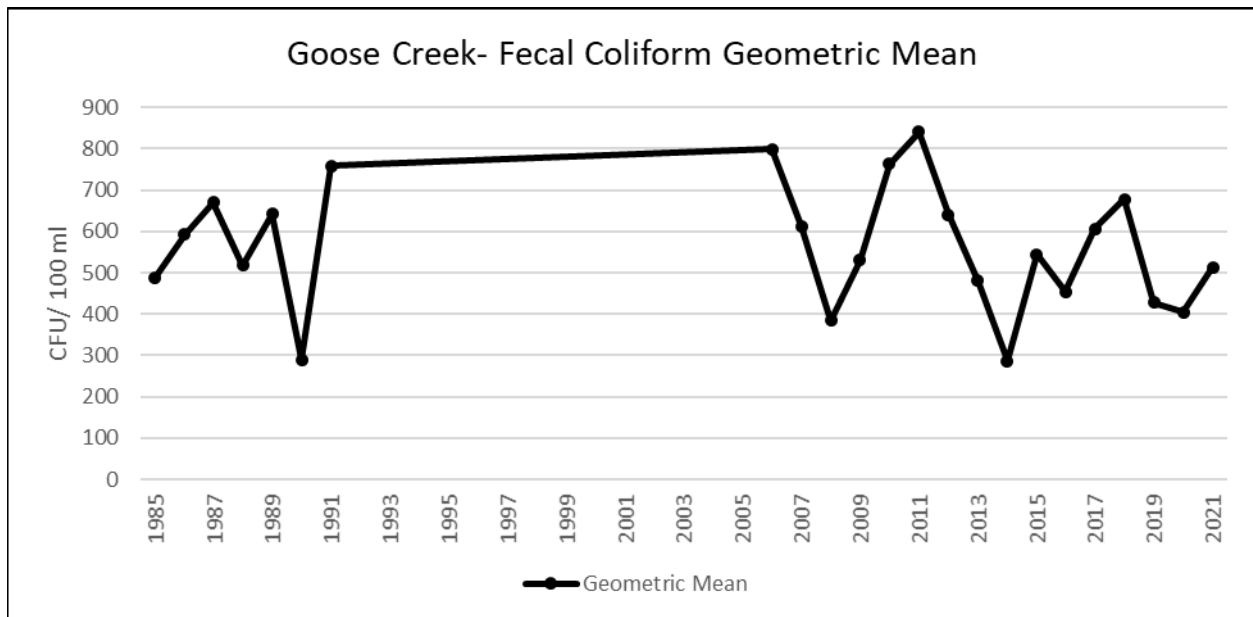


Figure 6: Geometric Mean for Fecal Coliform on Goose Creek Site MY9

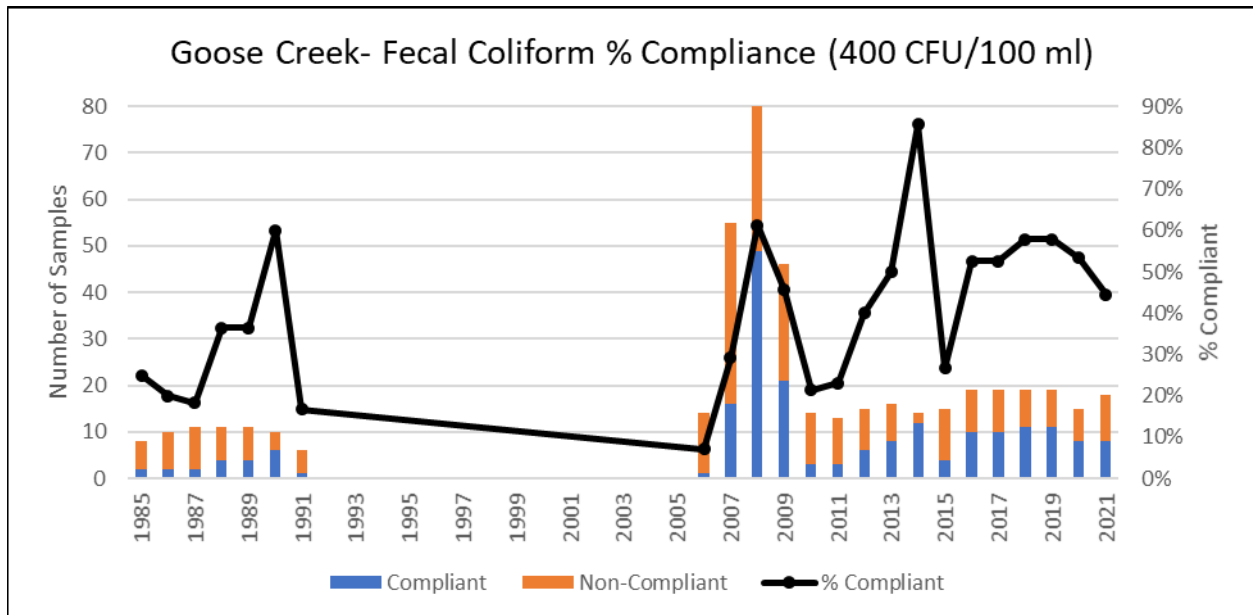


Figure 7: Compliance with Fecal Coliform Standard on Goose Creek Site MY9

### 3.3 Lake Wylie Chlorophyll-A Monitoring

As identified in Table 1, two (2) sections of Lake Wylie in Mecklenburg County (AU Numbers 11-(122) and 11-(123.5)a) are subject to a nutrient (nitrogen and phosphorus) TMDL. This TMDL was approved on February 5, 1996 and does not include a WLA assigned to storm water. Mecklenburg County has been assigned responsibility for compliance with this TMDL on behalf of the Phase I and Phase II jurisdictions in Charlotte-Mecklenburg.

Surface Water Quality Standards have not been established for nitrogen and phosphorus. As a result, Chlorophyll-a concentration is utilized as a proxy parameter for monitoring nutrient levels in Lake Wylie. According to the Draft NC 2022 305(b) report, the two TMDL segments of Lake Wylie are currently meeting the Chlorophyll-a criterion of 40 micrograms per liter ( $\mu\text{g/L}$ ). All 82 Chlorophyll-a samples collected by CMSWS in Lake Wylie in 2021 were below 40  $\mu\text{g/L}$ .

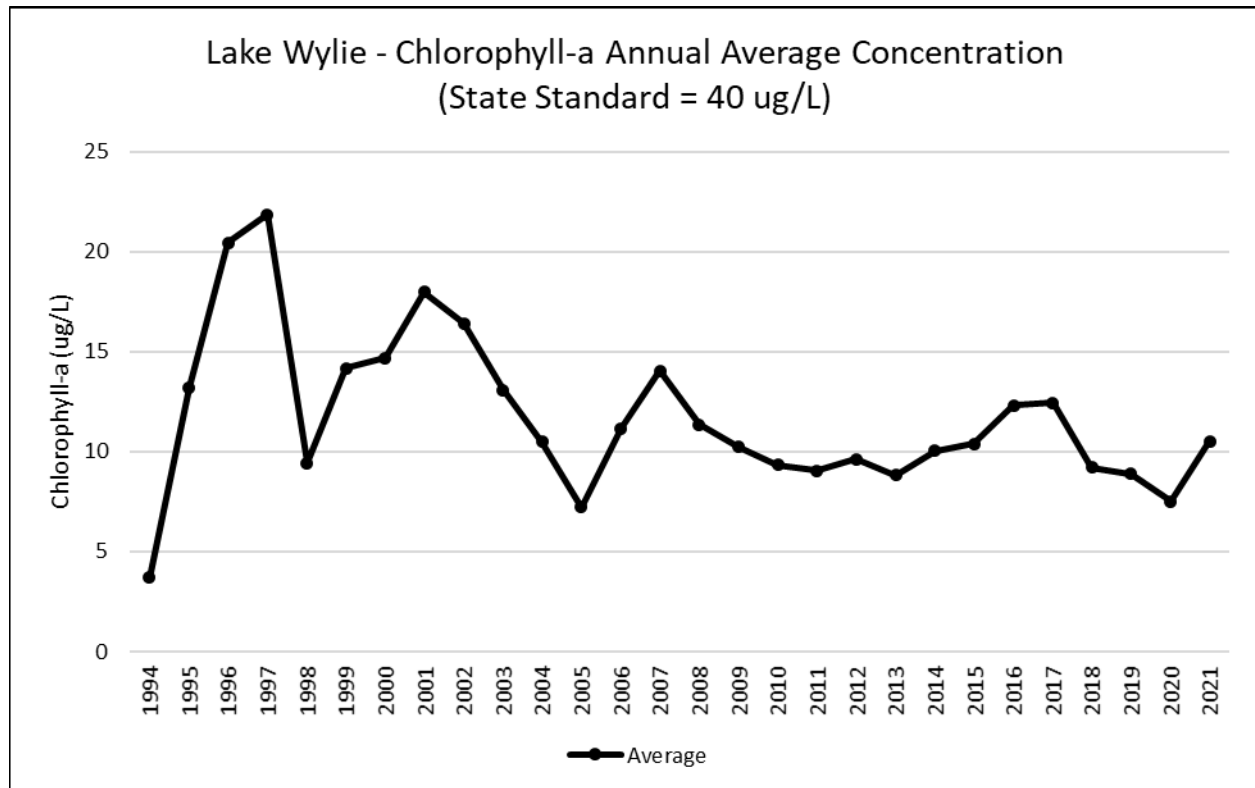


Figure 8: Annual Average Chlorophyll-a Concentration on Lake Wylie

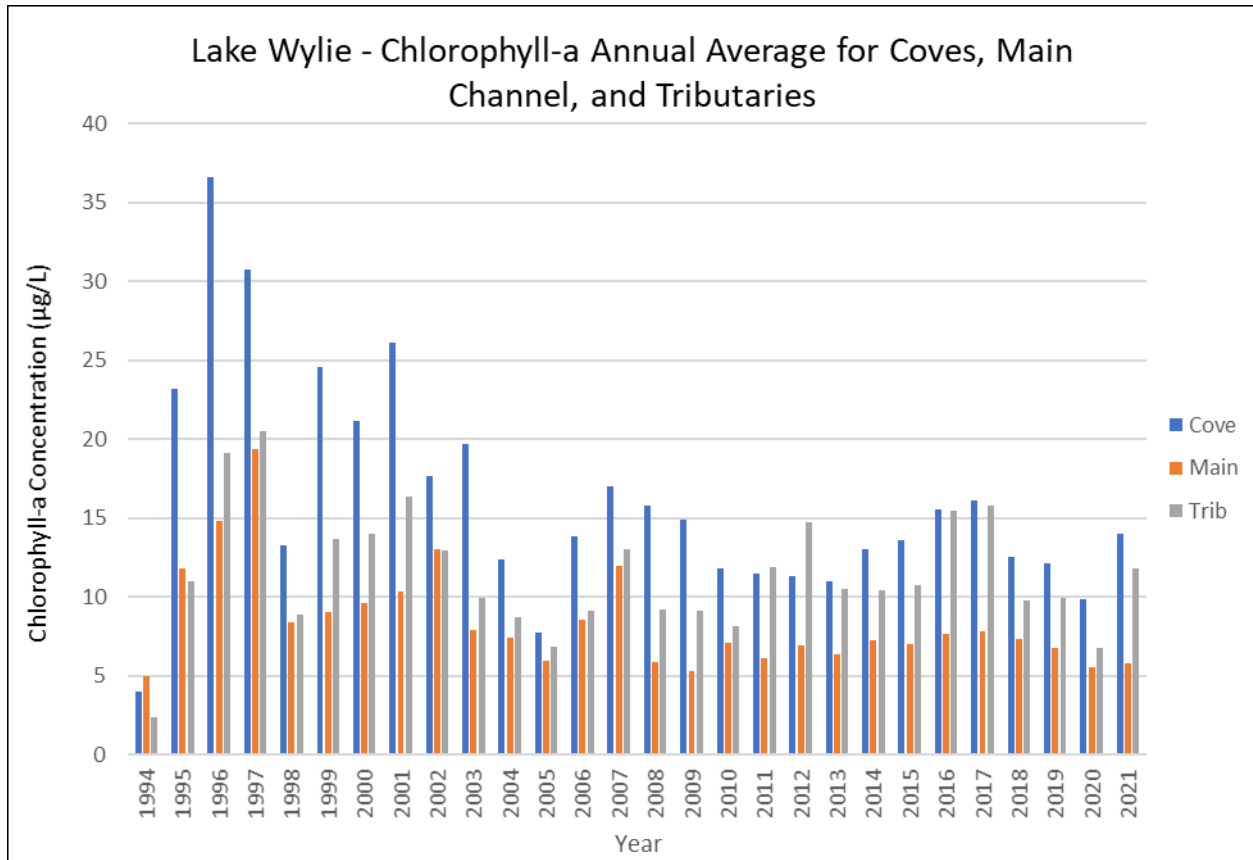


Figure 9: Annual Average Chlorophyll-a on Lake Wylie Coves, Main Stem and Tributaries

### 3.4 Mercury Monitoring Statewide

As stated in sub-section 9.5.3 of the Storm Water Plan, the State did not include an MS4 NPDES WLA for mercury in their statewide TMDL. Therefore, this document does not discuss compliance measures or data analysis for this TMDL.

### 3.5 Effectiveness of BMPs Based on Data Analysis

Based on the above-described assessments of data collected in the TMDL watersheds, a general improvement in Chlorophyll-a has been observed in Lake Wylie over the past several decades. In 2021, none of the Chlorophyll-a samples collected from Lake Wylie by CMSWS exceeded the state standard of 40 µg/L. Therefore, it is determined that the current BMPs are effective at identifying and eliminating pollution sources in compliance with TMDL requirements. These BMPs will continue to be implemented in FY2023.

The mean fecal coliform concentration observed in Rocky River in 2021 increased slightly from 2020. However, mean fecal coliform concentrations and compliance percentages have improved overall since the 1970s.

The mean fecal coliform concentration in Goose Creek exhibited a moderate increase between 2020 and 2021. The percentage of samples complying with applicable fecal coliform standards

decreased slightly over the same time. However, fecal coliform concentrations and compliance percentages have exhibited overall improvements since the mid-2000s. The existing BMPs for both the Rocky River and Goose Creek watersheds appear to be effective at identifying and eliminating pollution sources in compliance with TMDL requirements. These BMPs, along with the additional BMPs identified below, will continue to be implemented in FY2023.

#### **Section 4: Additional BMP Measures**

As required by Permit No. NCS000395, CMSWS is continuing to evaluate the effectiveness of the existing structural and/or non-structural BMPs described in the previous sections and identify and implement additional BMPs as necessary to effectively address impaired waters. The following subsections describe the additional BMPs implemented in FY2022, as well as those planned for implementation in FY2023 along with an implementation timeline, and a brief explanation as to how these additional BMPs will address impaired waters.

##### **4.1 Additional BMPs Implemented for the Rocky River TMDL in FY2022**

During FY2022, the following additional activities were completed to reduce fecal coliform bacteria levels and enhance water quality in the Rocky River watershed:

1. NCDEQ, Division of Water Quality continued to conduct water quality monitoring, including sampling for fecal coliform bacteria, at site Q7330000. Monitoring results are described in Section 3.2.
2. On October 7, 2021 Health Department records were reviewed and no failed septic systems were identified.
3. On October 27, 2021, the four (4) major outfalls in the Rocky River TMDL watershed in Mecklenburg County were inspected. No dry weather flows or pollution sources were detected.
4. In April 2022, restoration activities for a 9,000-foot section of West Branch Rocky River were completed. The project focused on the stabilization of stream banks, vegetation enhancements, and stream conveyance improvements. The project is also expected to result in an overall improvement of water quality.

##### **4.2 Additional BMPs Implemented for the Goose Creek TMDL in FY2022**

During FY2022, the following additional activities were completed to reduce fecal coliform bacteria levels and enhance water quality in the Goose Creek watershed:

1. Routine fixed interval monitoring was conducted monthly at site MY9 (Goose Creek – Stevens Mill Road) for 16 parameters including fecal coliform and E. coli. Monitoring results are described in Section 3.2.
2. Beginning on November 1, 2021 and concluding on April 22, 2022, CMSWS staff walked approximately 127.7 stream miles in the Phase II jurisdictions (see Figure 2). In all, 179 points or features were collected, 68 existing outfalls were inspected, and 65 new outfalls were recorded. Five dry weather flows were observed but all were too low to sample. Three significant problems and 11 stream blockages were also identified and reported to Mecklenburg County Storm Water Operations. Additionally, one illicit discharge was observed which resulted in the issuance of a Notice of Violation.

3. On October 7, 2021, Health Department records were reviewed and no failed septic systems were identified.
4. Throughout FY2022, in-stream fecal coliform and E. coli samples were collected in headwater areas of the of Goose Creek watershed to identify potential illicit discharges and sources of fecal coliform. Sampling was performed during ambient (not storm impacted) conditions and locations were selected based on proximity to low-pressure sanitary systems and historical analytical data. A total of 37 samples were collected from 23 locations within upper Goose Creek and associated tributaries. Twenty-five of the samples exceeded 400 CFU/100 mL and the geometric mean of all samples was 794.52 CFU/100 mL. Additional evaluations were performed in locations where the highest fecal coliform and E. coli concentrations were observed. These evaluations included follow-up sampling, camera inspections of private sanitary laterals, and inspection of livestock farms for manure releases. However, no damaged infrastructure or active discharges were observed.

#### 4.3 Additional BMPs to be Implemented in FY2023

During FY2023, the following additional BMPs will be implemented in the Rocky River and Goose Creek watersheds to reduce fecal coliform bacteria levels and enhance water quality:

1. Routine monitoring will continue to be performed monthly by CMSWS at MY9 on Goose Creek at Stevens Mill Road and by NCDEQ, Division of Water Quality at site Q7330000 on Rocky River at SR 2420. Exceedances of established water quality watch and action levels will be identified and follow up actions conducted as necessary for the identification and elimination of pollution sources.
2. By December 30, 2022, CMSWS will complete a review of Health Department records to determine where failed septic systems have been identified in both the Rocky River and Goose Creek TMDL watersheds. Follow up inspections and monitoring will be performed as necessary to ensure the elimination of sources of fecal coliform bacteria associated with failed septic systems thereby addressing impaired waters.
3. By March 31, 2023, major outfalls will be inspected in the Rocky River TMDL watershed. Dry weather flows will be identified and pollution sources eliminated thereby addressing impaired waters.
4. Construction activities associated with the restoration of an additional 5,000-foot section of West Branch Rocky River are expected to begin in late FY2023 or early FY2024. Historically, West Branch Rocky River has been severely degraded by storm water flows that erode the stream banks. The restoration project will stabilize the stream banks to reduce erosion and improve water quality.
5. Targeted surface water sampling in headwater areas of the Goose Creek watershed will continue in FY2023. Based on the results of FY2022 activities, additional surface water quality and watershed data is needed to further delineate sources of fecal coliform to the system. Watershed modeling and septic system assessments will be utilized to inform decision making and identify potential problem areas.

### Section 5: Tracking and Reporting Success

CMSWS will document all activities completed for the identification and elimination of pollution sources in the TMDL watersheds, including all inspections conducted and corrective



actions implemented. All confirmed pollution sources will be mapped in GIS and, where possible, pollutant loads will be estimated. This data will be tracked over time as a measure of the success of program activities.

## **Section 6: TMDL Reporting**

This report fulfills the SWQMPP TMDL reporting requirement by providing a summary of the following:

1. Description of water quality restoration activities completed during the past fiscal year.
2. Description of water quality restoration activities expected to occur next fiscal year.