Water Quality Recovery Program for the Rocky River Fecal Coliform Total Maximum Daily Load Assessment Unit Number 13-17a

Original: July 2010 Revised: July 2012, December 2014, and August 2015

# Background

The Total Maximum Daily Load (TMDL) for Fecal Coliform for the Rocky River (Subbasin 03-07-11) Yadkin-Pee-Dee River Basin, NC was approved in September, 2002. The TMDL was prepared by the NC Department of Environment and Natural Resources – Division of Water Quality (DWQ). Specifically, the 303(d) listing for the TMDL is as follows:

Name of Stream	Rocky River
Description	From Source to SR2420 in Mecklenburg County
Stream Class	С
Assessment Unit Number	13-17a
8 Digit Catalog Unit	03040105
Length	9.2 miles
Standard Violated	Fecal Coliform
Sources of Impairment	Point and nonpoint sources from entire watershed

The portions of the TMDL applicable to the municipally separate storm sewer system (MS4) in Mecklenburg County are as follows:

TMDL Source Category		Subwatershed	Wet Weather Fecal Coliform Loading Reductions	Dry Weather Fecal Coliform Loading Reductions	
Wasteload	Livestock	WS04-WS07	86%	20%	
Allocation	Grazing/Manure				
(WLA)	Application				
	(pastureland)				
	Manure	WS04-WS07	86%	20%	
	Application				
	(cultivated)				
	Wildlife	WS01-WS07	0%	0%	

### Task Schedule

Table 1 provides a description of the tasks assigned to TMDLs with WLAs assigned to MS4s and scheduled completion dates required by Mecklenburg County's Phase II Permit #NCS000395 as described in Section 9.4 of Mecklenburg County's Storm Water Quality Management Program Plan.

 Table 1: Schedule for Completion of Required TMDL Tasks

Requirement	Schedule
1. Description of the watershed.	Completed (see
	Section A below)
2. Map of the watershed showing streams and outfalls.	Completed (see
	Figure 1 below)

	Requirement	Schedule	
3.	Locations of currently known major outfalls with the potential of	Completed (see	
	contributing to the cause(s) of the impairment to the stream segments,	Figure 2 below)	
	to their tributaries, and to segments and tributaries within the		
	watershed contributing to the impaired segments.		
4.	Schedule to discover and locate other major outfalls not included in #3	Completed (see	
	above.	Section A below)	
5.	Description of existing measures being implemented to enhance water	Completed (see	
	quality.	Section B below)	
6.	Explanation as to how the measures in #5 above are designed to	Completed (see	
	enhance water quality.	Section B below)	
7.	Assessment of available monitoring data. Where long-term data is	Completed (see	
	available, this assessment should include an analysis of the data to	Section C below)	
	show trends.		
8.	Development and submittal to NCDENR of a Monitoring Plan for	Not Required (see	
	each pollutant of concern or cause of impairment as specified in the	Section D below)	
	TMDL. Implementation of the Monitoring Plan is required as		
	additional outfalls are identified and as accumulating data may		
	suggest. Following any review and comment by NCDENR, changes		
	are to be incorporated into the Monitoring Plan and implementation is		
	to occur within six (6) months. Modifications to the Monitoring Plan		
	shall be approved by NCDENR. Upon request, the requirement to		
	develop a Monitoring Plan may be waived by NCDENR if the		
	existing and proposed measures are determined to be adequate to		
	enhance water quality and reduce non-point source pollutant loading		
	to the maximum extent practicable.		
9.	Description of additional measures to be implemented to enhance	Completed (see	
	water quality.	Section E below)	
10	Explanation as to how the measures in #9 above are designed to	Completed (see	
	enhance water quality.	Section E below)	
11.	Description of activities to be implemented within the remainder of	Completed (see	
	the permit term to enhance water quality.	Section E below)	
12	Identification of a schedule for completing activities described in #11	Completed (see	
	above.	Section F below)	
13.	Description of methods for tracking and reporting successes designed	Completed (see	
	to reduce non-point source pollutant loading to the maximum extent	Section G below)	
	practicable. Successes could include increased inspections, expanded		
	and/or tailored BMPs within the scope of the six (6) minimum		
	measures, structural and non-structural BMPs installed and/or		
	implemented, including retrofits, and strategies developed and		
	implemented for development and redevelopment that include green		
4.1	intrastructure and LID practices.		
14	Annual assessment of the program to enhance water quality and	Completed (see	
	submittal of a report of the assessment to NCDENR. Any monitoring	Section H below)	
	data and information generated from the previous year are to be		
	submitted with each annual report.		

### Section A – Identify, Describe and Map Watershed, Outfalls, and Streams

The Rocky River Watershed (Assessment Unit 13-17a) is located in the northeast corner of Mecklenburg County and extends into portions of Iredell and Cabarrus Counties. This Water Quality Recovery Program applies to the Mecklenburg County portion of the watershed as identified in Figure 1. Figure 2 shows the one known storm water outfall in the Rocky River Watershed located in Mecklenburg County as of July 2010. The watershed area is comprised of large, primarily single family residential lots, farms and wooded areas. Table 2 and Figure 3 describe the land uses in the Rocky River Watershed in Mecklenburg County as of July 2010.

Land Use	Acres	% of Watershed	Impervious %	Impervious Acres
Rural Residential/Forest	563.7	79.7%	4.0%	22.5
Low Density Residential	88.7	12.5%	9.0%	8.0
Transportation	17.4	2.5%	36.0%	6.3
Medium/Low Density				
Residential	36.9	5.2%	19.0%	7.0
Medium Density Residential	0.3	0.0%	30.0%	0.1
Watershed Total	707.0	100%	6.2%	43.9

Table 2: Land Uses in the Rocky River Watershed in Mecklenburg County as of July 2010

New outfalls constructed in the watershed will be associated with land development activities, which are inspected by Mecklenburg County's Permitting and Compliance Program. The inspectors with this program will note all new outfalls on the established GIS layer, which will be evaluated by staff with Charlotte Mecklenburg Storm Water Services (CMSWS) on an annual basis as part of the process for updating the Rocky River Water Quality Recovery Program. These new outfalls will be identified in subsequent sections of this document as part of the annual updates.





Figure 2: Storm Water Outfalls in the Rocky River Watershed in Mecklenburg County as of July 2010





Figure 3: Land Uses in the Rocky River Watershed in Mecklenburg County as of July 2010

# **Section B - Existing Measures**

There are several existing programs in place to address the sources of impairment related to Fecal Coliform in the Rocky River Watershed in Mecklenburg County as described below.

# Public Education and Outreach

An ongoing Public Education and Outreach program has been designed and implemented in Mecklenburg County's Phase II jurisdictions (including the Rocky River Watershed) to provide citizens and businesses with the information necessary to be informed and assist with various efforts aimed at addressing Fecal Coliform issues in the watershed. The program provides the following:

- 1. A dedicated web page within the Charlotte Mecklenburg Storm Water Services (CMSWS) website specific to the TMDL and WQRP in the Rocky River Watershed.
- 2. Fecal Coliform specific information in brochures, bill inserts and web pages.
- 3. Volunteer activities including Adopt-a-Stream and Storm Drain Marking activities
- 4. Media campaign containing Fecal Coliform specific messages such as proper pet waste disposal.

# Illicit Discharge Detection and Elimination (IDDE)

The IDDE program is designed to identify sources of Fecal Coliform in the watershed. Field investigations are conducted in the watershed to identify and eliminate sources of illicit connections and improper disposal, including responding to citizen requests for services and emergency situations.

### Rocky River Watershed Management Plan Implementation

CMSWS prepared the Rocky River Watershed Management Plan in October 2010. It presents an analysis of the Fecal Coliform loading in the watershed and identifies water quality improvement projects that will help to reduce levels of Fecal Coliform in the watershed. The Rocky River Watershed Management Plan is available on our website at <u>http://stormwater.charmeck.org</u> (select "Storm Water Basics", select "Master Plans and Long-Term Strategies", select "Water Quality Recovery Plans and Watershed Master Plans", select "Rocky River Watershed Management Master Plan.")

# Section C - Assessment of Available Monitoring Data

CMSWS does not currently maintain a monitoring site on the Rocky River (AU 13-17a) as explained in Section D. CMSWS has obtained all Fecal Coliform data collected from the Rocky River Watershed (AU 13-17a) by DWQ at monitoring site Q733 located at 35.4749, -80.77948 (see Figure 4). Fecal Coliform data at Q733 begins on July 15, 1970 and continues at various intervals, generally monthly, until October 2, 1986. The Fecal Coliform sampling was restarted on May 2, 1995 and continued monthly through 2014. DWQ was contacted concerning the missing data between October 2, 1986 and May 2, 1995. DWQ verified the Fecal Coliform sampling was not performed during these years. All available Fecal Coliform data from DWQ for Q733 was analyzed to identify trends. A five (5) year rolling average was calculated for violations of the instantaneous Fecal Coliform standard of 400 colonies/100 ml. as shown in Figure 5. A definite downward trend is visible, especially from 1980 through 1985 and again

from 2010 through 2014. The geometric mean for Fecal Coliform for 2010-2014 is 248 and for 2011-2014 is 230.







Figure 5: Five (5) Year Average Fecal Coliform Violation Rate at DWQ's Monitoring Site Q733 (number of samples represented in the 5 year average is shown next to the point)

#### Section D - Monitoring Plan

Per the requirements outlined in Section H.2.d of NPDES Permit No. NCS000395, a Monitoring Plan is to be developed for the Fecal Coliform TMDL in the Rocky River (Subbasin 03-07-11; AU No. 13-17a) unless a waiver is received from DWQ. In August 2013, CMSWS submitted a letter to DWQ requesting such a waiver for the following reasons:

- 1. NCDENR maintains a monitoring site on the Rocky River. Figure 4 shows the portion of the TMDL watershed within Mecklenburg County along with the existing NCDENR monitoring site #Q733. Additional monitoring on the impaired section of the Rocky River would duplicate the sampling conducted at this location.
- 2. Outfall monitoring would provide little useful information. There is only one storm water outfall located in the Mecklenburg portion of the watershed as shown in Figure 2. It receives runoff from several large lot residential homes. The storm water from the outfall flows through more than 200 feet of forested buffer before discharging to the Rocky River. Inspection of the outfall shows very limited erosion or scour indicating very limited flow and a high degree of infiltration.
- 3. No perennial streams drain from Mecklenburg County to the impaired section of the Rocky River. All drainage from Mecklenburg County to the impaired section of the Rocky River flows through intermittent channels and/or direct overland flow. Sampling of intermittent channels and overland flow is very difficult and of questionable usefulness. Moreover, the stream buffer is largely forested ensuring ample treatment of the runoff conveyed to the Rocky through the intermittent channels and overland pathways.

In their response letter dated June 26, 2014, DWQ approved the request to waive the monitoring requirement for the Rocky River stating the following: "The state waives the requirement for a Monitoring Plan for the Fecal Coliform TMDL in the Rocky River (AU 13-17a). Mecklenburg County should 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 may be warranted." For the completion of this annual analysis, CMSWS has decided to use the following watershed measures: increase in impervious area broken down for residential and commercial land uses and increase in storm water outfalls. The justification for the use of these watershed measures is that as impervious area and the number of outfalls increase in the watershed the Fecal Coliform waste load contribution from storm water will also increase thus necessitating a monitoring effort to identify and control contributing sources for meeting the TMDL. Impervious area is updated countywide on an ongoing basis by Mecklenburg County's GIS program. This data is used in assessing storm water fees and is fairly accurate. New outfalls are identified and entered into GIS by CMSWS when final inspections are performed of new construction. The data collected for this watershed analysis through January 2015 is provided in Table 3. The two (2) additional outfalls indicated in Table 3 are shown in Figure 6. The existing impervious coverage in the watershed are shown in Figure 7. The percentage of impervious cover in the watershed is unchanged from 2011 at 6.2%.

Watershed Measure	2011	2012	2013	2014	# Increase from FY11	% Increase from FY11
Residential Impervious Cover (acres)	14.22	14.22	14.17	14.19	0.0	0%
Commercial Impervious Cover (acres)	0.33	0.33	0.33	0.33	0.0	0%
Total Impervious Cover (acres)	14.55	14.55	14.5	14.52	0.0	0%
Storm Water Outfalls (number)	1	1	3	3	2.0	200%

Table 3: Annual Analysis of the Rocky River Watershed for the Monitoring Plan

Based on the results of this analysis, CMSWS has determined that the additional storm water infrastructure and increased impervious cover through 2014 do not warrant the development and implementation of a Monitoring Plan in the Rocky River. The next annual analysis will occur in January 2016.

Figure 6: Storm Water Outfalls in the Rocky River Watershed in Mecklenburg County as of January 2015







# Section E - Additional Measures to be Implemented to Enhance Water Quality

CMSWS is continuing to develop and implement measures to improve water quality conditions in the Rocky River watershed where the TMDL applies by identifying and eliminating sources of Fecal Coliform bacteria. In 2014, CMSWS completed a review of historic aerial imagery from the watershed, which revealed that since 1993 an equestrian area had been located approximately one-half mile upstream of monitoring site Q733 on the Mecklenburg County side of the Rocky River. In recent years, a septic system was installed to treat wash water from a stable located in this area. CMSWS performed monitoring upstream and downstream of this potential source, but results were inconclusive. During 2014, additional measures were implemented to further improve water quality by enhancing a buffer area adjacent to the Rocky River, which will provide additional filtering for nonpoint source pollutants and improved habitat conditions. This occurred in November 2014 when approximately 250 trees were planted in the Rocky River Bluff Nature Preserve (Parcel Number 00307115) by a total of 31 volunteers through a partnership between CMSWS, Mecklenburg County Park & Recreation Department, and the Davidson Lands Conservancy. Partial funding for the event was provided through an Urban Cost Share Grant.

During 2015 and through the remainder of the permit term ending in November 2016, additional aerial imagery for the watershed will be evaluated and other potential sources of Fecal Coliform will be identified for follow up actions. If a Fecal Coliform source is confirmed, CMSWS will initiate the necessary corrective measures. There are several agricultural activities in the watershed that may be contributing to elevated Fecal Coliform levels. If these agricultural activities are confirmed as a Fecal Coliform source, CMSWS will work with the Mecklenburg County Soil and Water Conservation District to initiate appropriate corrective measures where feasible. In addition, CMSWS plans to perform additional follow up actions at the equestrian area described above to further evaluate its contribution to elevated Fecal Coliform levels. CMSWS will also review the records for septic system failures maintained by the Health Department to identify potential Fecal Coliform sources. The necessary follow up actions will be initiated to identify and eliminate these sources working in cooperation with the Health Department.

# Section F - Implementation Plan and Schedule

Provided below are the additional activities to be performed by CMSWS to enhance water quality in the Rocky River watershed where the TMDL applies and the schedule for completion of these activities.

- 1. Complete an evaluation of the aerial imagery for the watershed to identify potential sources of Fecal Coliform m bacteria Complete by December 31, 2015.
- 2. Review data and information provided by the Health Department to identify potential failing septic systems in the watershed that may be a potential source of Fecal Coliform bacteria Complete by December 31, 2015.
- 3. Complete follow up activities to confirm Fecal Coliform sources identified in numbers 1 and 2 above Complete by March 31, 2016.
- 4. Complete actions necessary to eliminate Fecal Coliform sources identified in number 3 above Complete by June 30, 2016.

# **Section G - Incremental Success**

CMSWS will document all activities completed for the identification and elimination of pollution sources in the watershed, including all inspections conducted and corrective actions implemented. All confirmed Fecal Coliform 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 H – Reporting

CMSWS will prepare an annual report for activities relating to the implementation of the WQRP for Fecal Coliform in the Rocky River Watershed. The Report will be submitted to DWQ by October 1 of each calendar year. The report will include the following information:

- 1. Report of WQRP activities during the previous year.
- 2. Assessment of current and historical monitoring data
- 3. Recommendations for modification of the WQRP.
- 4. Cost/Benefit analysis of any measures implemented during the previous year.