EPA FINALIZED TMDL

South Carolina
Department of Health and Environmental Control

Rabon Creek (Hydrological Unit Code: 03050109-130);
Stations: S-322, S-321, S-096, S-307
Fecal Coliform Bacteria

September 29, 2004

Bureau of Water
2600 Bull Street
Columbia, SC 29201

In compliance with the provisions of the Federal Clean Water Act, 33 U.S.C §1251 et.seq., as amended by the Water Quality Act of 1987, P.L. 400-4, the U.S Environmental Protection Agency is hereby establishing a Total Maximum Daily Load (TMDL) for fecal coliform bacteria in the Rabon Creek Basin. Subsequent actions must be consistent with this TMDL.

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James D. Giattina, Director Date
Water Management Division

Abstract

The Rabon Creek watershed (11-digit HUC 03050109-130) is located in the Saluda River Basin in Laurens and Greenville counties near the towns of Laurens, Simpsonville, Fountain Inn, and Gray Court (Figure 1-1). Four stations in the watershed have been placed on the South Carolina §303(d) list of impaired waters for violations of the fecal coliform standard. The impaired stations are S-322 (South Rabon Creek on dirt road between SC 101 and S-30-76), S-321 (North Rabon Creek at S-30-32), S-096 (Rabon Creek at S-30-54 8.8 miles NW of Cross Hill, SC), and S-307 (Lake Greenwood in Rabon Creek arm North of road S-30-307). The watershed is composed of mostly forested land (67%) with some pastureland (15%) and cropland (14%). The headwaters include one or more Municipal Separate Storm Sewer Systems (MS4) for unincorporated Greenville County and two towns. Mountain Creek, a tributary to Rabon Creek, is the discharge point of the watershed's only continuous fecal coliform discharge, S&S Washerette (SC0032298), a laundry and dry cleaning facility.

The load-duration curve methodology was used to establish allowable fecal coliform loads in the watershed. The existing load was determined using measured data from the impaired water quality monitoring stations. Loads were established from measured concentrations and a power trend was generated with the samples violating the instantaneous standard. The existing load and allowable total maximum daily load for impaired stations is presented in Table I. To achieve the TMDL target, reductions of fecal coliform loads will be necessary, as shown in Table I.

Table I Total Maximum Daily Loads for Impaired Water Quality Stations in the Rabon Creek Watershed (03050109-130)

Station ID	Existing WasteLoad	TMDL WLA		Existing Load	TMDL LA	MOS	TMDL[3]	Percent Reduction[4]
	Continuous (counts/day)	Continuous[1] (counts/day)	MS4[2] (counts/day)	(counts/day)	(counts/day)	(counts/day)	(counts/day)	
S-322	NA	NA	3%	2.51E+11	2.30E+11	1.28E+10	2.43E+11	3%
S-321	3.48E+07	3.48E+07	58%	7.27E+11	2.87E+11	1.60E+10	3.03E+11	58%
S-096	3.48E+07	3.48E+07	NA	3.14E+12	1.05E+12	5.85E+10	1.11E+12	65%
S-307[5]	3.48E+07	3.48E+07	NA	NA[5]	1.07E+12	5.97E+10	1.13E+12	NA

Table Notes:

1. Total monthly wasteload cannot exceed 5.22E+08 counts/30-day.
2. MS4 expressed as % reduction equal to LA reduction.
3. TMDLs expressed as monthly load by station is: S-322 3.65E+12 counts/30-day; S-321 4.55E+12 counts/30-day; S-096 1.67E+13 counts/30-day; and S-307 1.70E+13 counts/30-day.
4. Percent reduction applies to LA and MS4 components.
5. The load allocated at S-307 is addressed through the TMDL at S-096 and expected reductions presented for S-096.

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1.0 INTRODUCTION

1.1 Background

Levels of fecal coliform bacteria can be elevated in waterbodies as the result of both point and nonpoint sources of pollution. Section §303(d) of the Clean Water Act and EPA's Water Quality Planning and Management Regulations (40 CFR Part 130) require states to develop total maximum daily loads (TMDLs) for waterbodies that are not meeting designated uses under technology-based pollution controls. The TMDL process establishes the allowable loadings of pollutants or other quantifiable parameters for a waterbody based on the relationship between pollution sources and instream water quality conditions so that states can establish water quality-based controls to reduce pollution and restore and maintain the quality of water resources (USEPA, 1991).

The State of South Carolina has placed four monitoring stations in the Rabon Creek watershed (11-digit HUC 03050109-130) on South Carolina's 2002 Section §303(d) list for impairment due to fecal coliform bacteria. These stations are identified in Table 1-1.

Table 1-1 Water Quality Monitoring Stations Impaired by Fecal Coliform in the Rabon Creek Watershed (03050109-130)

Basin	Waterbody ID	Waterbody Location
Rabon Creek	S-096	Rabon Ck at S-30-54 8.8 miles NW of Cross Hill
Rabon Creek	S-307 or CL-051	Lake Greenwood in Rabon Ck Arm N Road S-30-307
Rabon Creek	S-321	N Rabon Ck at S-30-32
Rabon Creek	S-322	S Rabon Ck on Dirt Rd Between SC 101 & S-30-76

1.2 Watershed Description

The Rabon Creek watershed (03050109-130) is located in portions of Laurens and Greenville counties near the towns of Laurens, Simpsonville, Fountain Inn, and Gray Court (Figure 1-1) in the Saluda River Basin. Rabon Creek is formed at the confluence of North Rabon Creek and South Rabon Creek and ultimately discharges to Lake Greenwood. Rabon Creek is classified as a freshwater stream for recreational use. The watershed drains 127.3 square miles in the Piedmont region of South Carolina.

Based on 1996 USGS Multi-Resolution Land Characteristic (MRLC) land use data, 67 percent of the watershed is forested. The remaining 33 percent is composed of pastureland (15%), cropland (14%), urban area (2%), and a small mix of water and barren land uses (2%). Table 1-2 presents the percentage of total watershed area for each aggregated land use. Table A-1 (Appendix A) presents the percentage of land use area in each monitoring station drainage area. Figure 1-2 illustrates land use for the Rabon Creek watershed.

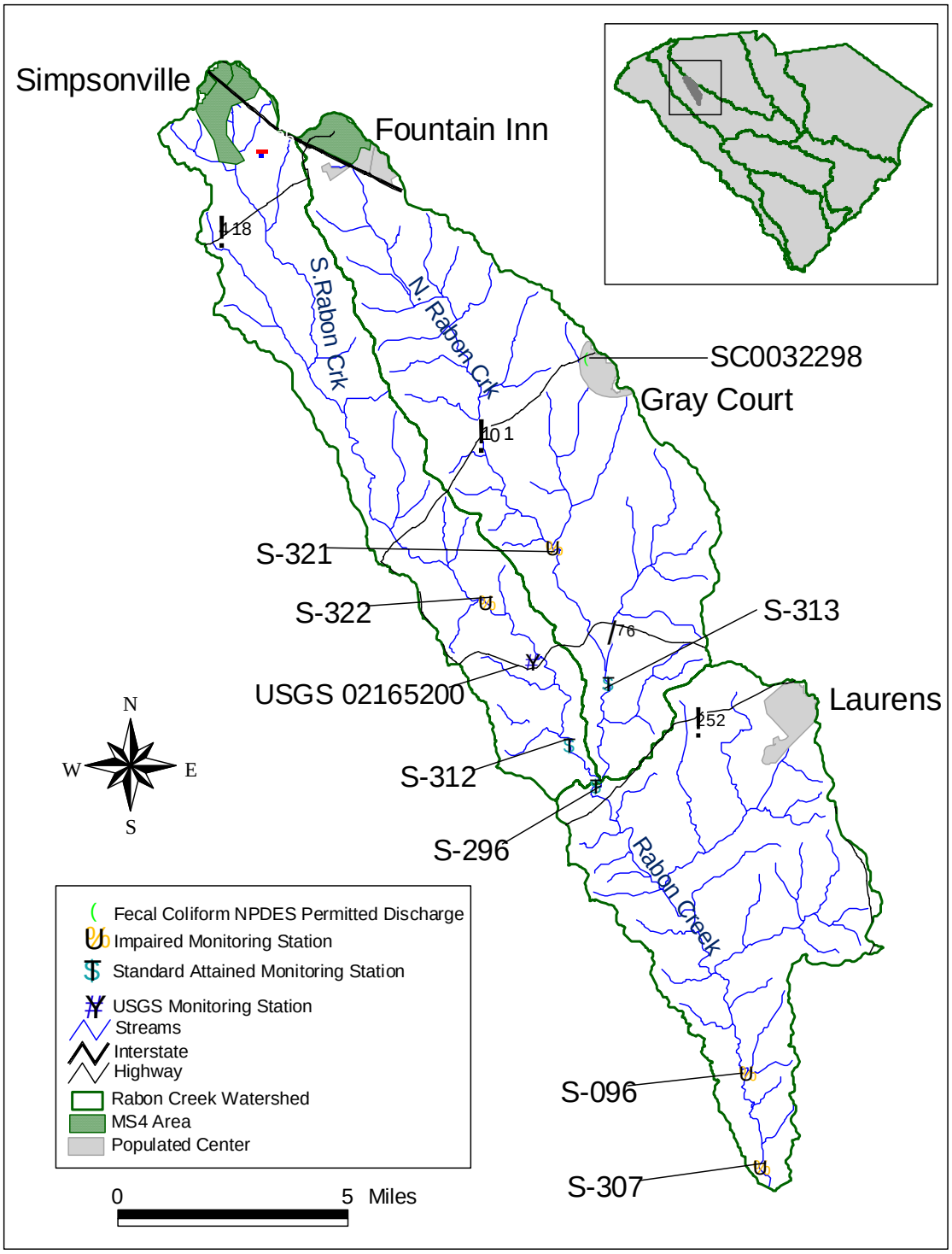

Figure 1-1 Rabon Creek Watershed (03050109-130)

Table 1-2 MRLC Aggregated Land Use for the Rabon Creek Watershed (03050109-130)

Aggregated Land Use	Percent of Total Area
Urban	1.6%
Barren	1.3%
Row Crops	14.1%
Pasture	15.5%
Forest	66.8%
Water	0.7%

1.3 Water Quality Standard

The impaired stream segments of Rabon Creek are designated as Class Freshwater. Waters of this class are described as:

> "Freshwaters suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses." (R.61-68)

South Carolina's standard for fecal coliform bacteria in freshwater is:

> "Not to exceed a geometric mean of 200/100 mL, based on five consecutive samples during any 30 day period; nor shall more than 10 percent of the total samples during any 30 day period exceed 400/100 mL." (R.61-68).

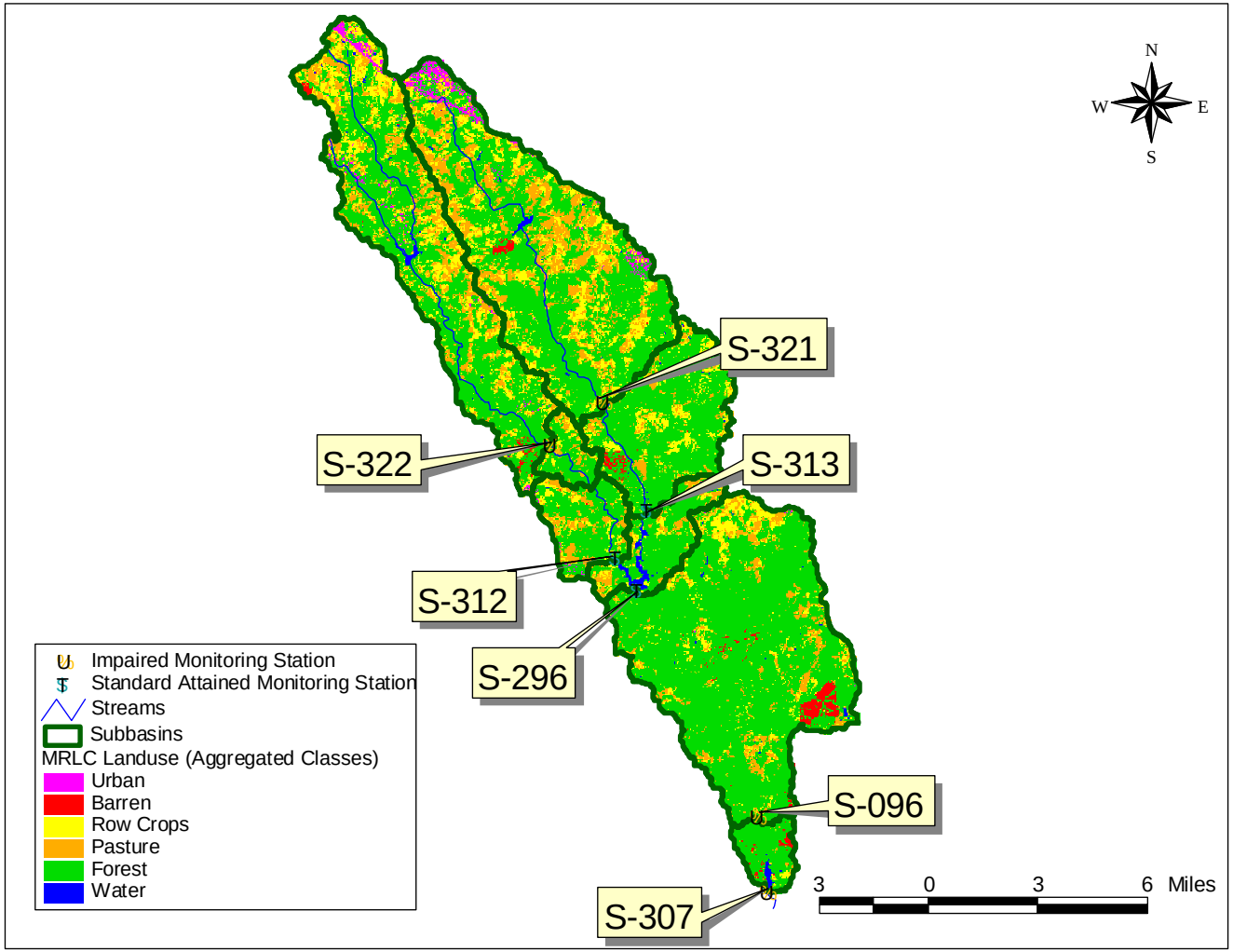

Figure 1-2 Rabon Creek Watershed Land Use

2.0 WATER QUALITY ASSESSMENT

Fecal coliform bacteria data collected in the Rabon Creek watershed from 1990 through 2001 were assessed to determine impairment of standards for recreational use. The State of South Carolina monitors fecal coliform bacteria at seven stations in the watershed; S-322, S-321, S-313, S-312, S-296, S-096, and S-307. Figure 1-1 shows the location of water quality monitoring stations in the watershed. Fecal coliform bacteria data collected at these stations is presented in Table A-2 of Appendix A.

Four water quality monitoring stations in the Rabon Creek watershed have been identified on the State of South Carolina Section §303(d) list for 2002 as impaired; S-307, S-096, S-312, and S-313. Waters in which no more than 10 percent of the samples collected over a five year period are greater then 400 fecal coliform counts per 100 mL are considered to comply with the South Carolina water quality standard for fecal coliform bacteria. Waters with more than 10 percent of samples greater than 400 counts per 100 mL are considered impaired and were listed for fecal coliform bacteria on the State of South Carolina Section §303(d) list. Table 2-1 presents the statistical information used to establish impairment at water quality monitoring sites in the watershed.

The timeframe, both annually and seasonally, of water quality monitoring at each station varies greatly. The statistical assessment presented in Table 2-1 was based on data collected over the five-year period from 1996 through 2000.

Table 2-1 Statistical Assessment of Observed Fecal Coliform Bacteria from 1996-2000

Station	Total Number of Samples	Total Number of Samples >400 #/100 mL	Percent of Samples >400 #/100 mL
S-322	15	9	58%
S-321	15	3	20%
S-313	8	0	0%
S-312	8	0	0%
S-0296	56	1	2%
S-096	42	8	19%
S-307 or CL-051	15	2	13%

After determining compliance with water quality standards, observed violations were assessed to determine conditions critical to impairment. Data were compared with estimated streamflows to establish a relationship between instream concentrations and hydrologic conditions. Due to limited streamflow data in the watershed, observed data were plotted with the load-duration curve generated based on area-weighted flows. The development of load-duration curves is discussed further in Section 4.0 of this report. Load-duration curves plotted for each station in Figures 2-1 through 2-4 are equal to the TMDL target based on the criteria for instantaneous events. The observed fecal coliform

bacteria data were also converted from counts per 100 mL to loads in counts per day to assess hydrologic conditions when the standard is not attained.

The percent of flow exceeded in Figures 2-1 through 2-4 represents flow conditions at each monitoring station. Hydrologic conditions for very dry events, likely to be exceeded in 99.99 percent of measured events, are represented as 99.99 percent. Extremely wet events that occur rarely are represented as 0.01 percent. Data collected at stations in the upper portion of the watershed, S-321 and S-322, shown in Figures 2-1 and 2-2, have violations during all flow conditions. The same is true in the lower watershed station S-096, Figure 2-3.

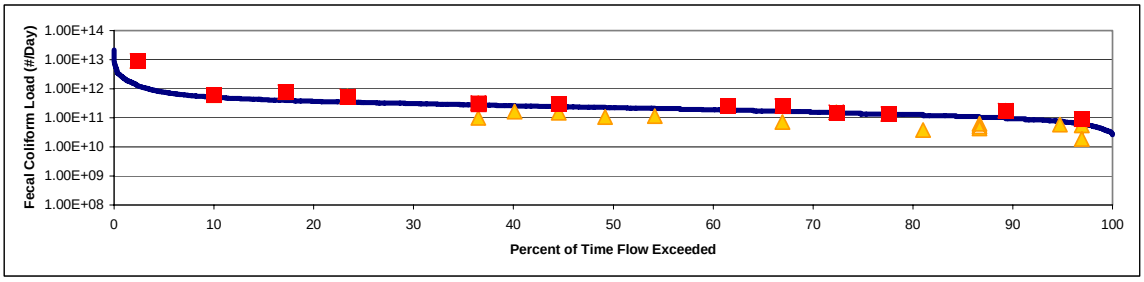

Figure 2-1 Fecal Coliform Bacteria Load-Duration Curve for Station S-322 Illustrating Observed Fecal Coliform Bacteria Loads Over Various Hydrologic Conditions

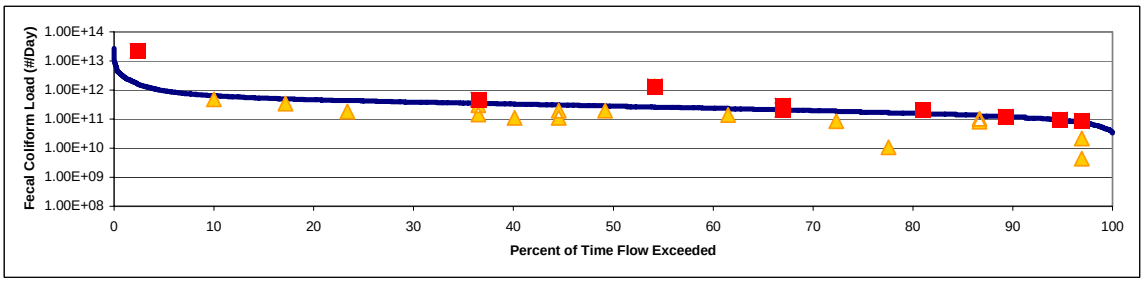

Figure 2-2 Fecal Coliform Bacteria Load-Duration Curve for Station S-321 Illustrating Observed Fecal Coliform Bacteria Loads Over Various Hydrologic Conditions

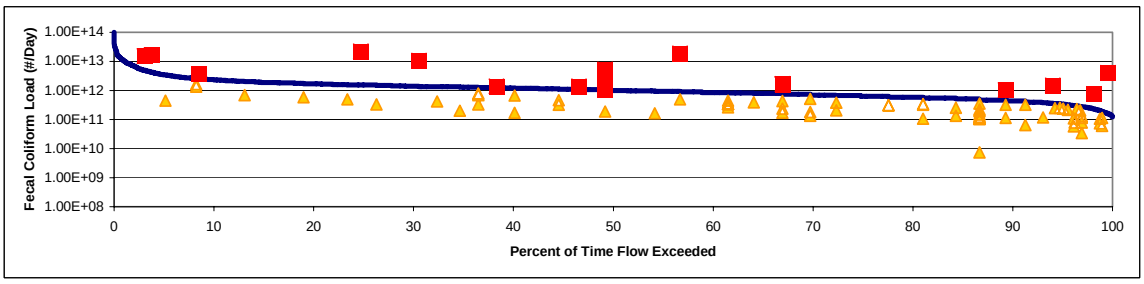

Figure 2-3 Fecal Coliform Bacteria Load-Duration Curve for Station S-096 Illustrating Observed Fecal Coliform Bacteria Loads Over Various Hydrologic Conditions

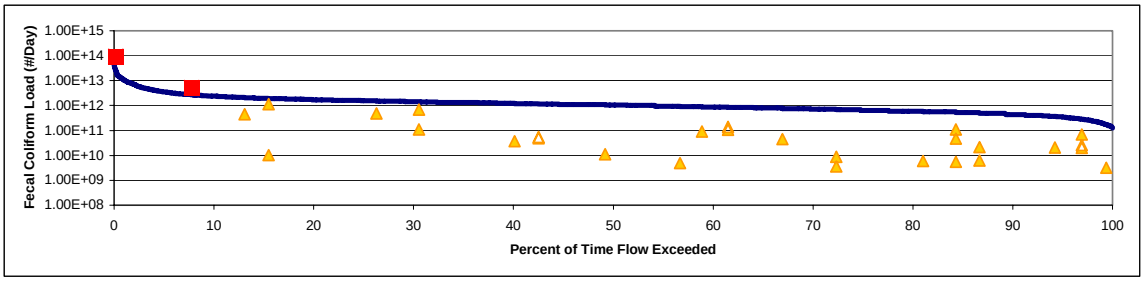

Figure 2-4 Fecal Coliform Bacteria Load-Duration Curve for Station S-307 Illustrating Observed Fecal Coliform Bacteria Loads Over Various Hydrologic Conditions

Of the data collected at S-307 (Figure 2-4), located three miles downstream of S-096 in Lake Greenwell, two violations of the instantaneous standard were measured in 1997. These violations occurred during high flow events. For the purpose of fecal coliform bacteria TMDL development in the Rabon Creek watershed, it is assumed that attainment of water quality standards at S-096 will result in the attainment of standards at S-307. Therefore, the TMDL for S-307 is addressed through the TMDL for S-096.

3.0 SOURCE ASSESSMENT AND LOAD ALLOCATION

Fecal coliform bacteria enter surface waters from both point and nonpoint sources. Point sources are facilities that discharge at a specific location through pipes, outfalls, and/or conveyance channels. All point sources must have a National Pollutant Discharge Elimination System (NPDES) permit and are often municipal wastewater treatment plants or industrial waste treatment facilities. Nonpoint sources are diffuse sources that have multiple routes of entry into surface waters. Some nonpoint sources are related to land use activities that accumulate fecal coliform bacteria on the land surface (i.e. pastureland) and runoff during storm events.

3.1 Point Sources

There are two active point sources discharging fecal coliform bacteria in the Rabon Creek watershed, the S & S Washerette (SC0032298). In South Carolina, NPDES permittees that discharge sanitary wastewater must meet the State criteria for fecal coliform bacteria at the point of discharge (i.e. a daily maximum concentration of 400 counts per 100 mL, and a 30-day geometric mean of 200 counts per 100 mL).

3.1.1 Continuous Point Sources

The S & S Washerette (SC0032298) is a laundry and dry cleaning facility in Gray Court, South Carolina, as shown in Figure 1-1. The facility does not have a specified allowable flow limit but is required to measure and report flow. Table 3-1 lists permit information pertinent to fecal coliform bacteria TMDL development. The facility discharges to Mountain Creek, a tributary to North Rabon Creek and is located approximately 17 miles upstream of the impaired water quality station S-096.

Table 3-2 presents fecal coliform bacteria concentration statistics for the facility. Estimates of existing fecal coliform bacteria loads based on the geometric mean are shown in Table 3-3. Estimated loads are based on the design flow from the facility and the permitted geometric mean concentration of 200 counts per 100 mL. DMR data for the facility are presented in Tables A-3 and A-4 of Appendix A.

Table 3-1 Permitted Facilities Discharging Fecal Coliform Bacteria into Waterbodies of the Rabon Creek Watershed

NPDES No.	Facility Name	Principal Activity	Receiving Waterbody	Fecal Coliform Bacteria Limit		Flow Limit (MGD)
SC0032298	S&S Washerette	Laundry and dry cleaning	Mountain Creek	Daily Maximum of 400 counts/100mL	30-day monthly average of 200 counts/100mL	MR*

*MR=Measure and report only

Table 3-2 Fecal Coliform Bacteria Statistics for NPDES SC0032298

NPDES No.	SC0032298
Pipe	1
Number of Observations	104
Mean	78
Geometric Mean	4
Minimum	<1
Maximum	1800
25th Percentile	0.5
Median	3
75th Percentile	8.3
Min Date	Multiple Dates
Max Date	12/31/1991

Table 3-3 Estimated Existing Fecal Coliform Bacteria Loads from NPDES SC0032298 in the Rabon Creek Watershed

NPDES No.	Facility Name	Design Flow (MGD)	FC Load (counts/day)	FC Load (counts/30 days)
SC0032298	S&S Washerette	0.0023	3.48E+07	5.22E+08

3.1.2 Municipal Separate Storm Systems (NPDES)

The Rabon Creek watershed has or will have one or more MS4 permits for unincorporated Greenville County and the towns of Fountain Inn and Simpsonville. The MS4 area is within the upper portion of the watershed as shown in Figure 1-1. The permitted area covers six percent of the area draining to station S-322 and three percent of the area draining to S-321. These permitted sewer systems will be treated as point

sources in the TMDL calculations below. However the load-duration curve method does distinguish among sources.

In 1990, EPA developed rules establishing Phase I of the National Pollutant Discharge Elimination System (NPDES) storm water program, designed to prevent harmful pollutants from being washed by storm water runoff into Municipal Separate Storm Sewer Systems (MS4s) (or from being dumped directly into the MS4) and then discharged into local waterbodies (SCDHEC, 2002). Phase I of the program required operators of medium and large MS4s (those generally serving populations of 100,000 or greater) to implement a storm water management program as a means to control polluted discharges from MS4s. Approved storm water management programs for medium and large MS4s are required to address a variety of water quality related issues including roadway runoff management, municipal owned operations, and hazardous waste treatment. Greenville County has a Phase I MS4 permit.

Phase II of the rule extends coverage of the NPDES storm water program to certain small MS4s. Small MS4s are defined as any MS4 that is not a medium or large MS4 covered by Phase I of the NPDES Storm Water Program. Phase II requires operators of regulated small MS4s to obtain NPDES permits and develop a storm water management program. Programs are to be designed to reduce discharges of pollutants to the "maximum extent practicable", protect water quality, and satisfy appropriate water quality requirements of the Clean Water Act.

3.2 Nonpoint Sources

The land use distribution of the Rabon Creek watershed provides insight into determining nonpoint sources of fecal coliform bacteria (Figure 1-2). In the watershed more than half of the land area is classified forested (67%), and nearly 16 percent of the area is pastureland.

3.2.1 Wildlife

Wildlife, including deer, raccoons, wild turkeys, and waterfowl, contribute low levels of fecal coliform bacteria to surface waters. The Department of Natural Resources in South Carolina estimated a deer density of more than 45 deer per square mile of deer habitat (Data provided by Charles Ruth, Deer Project Supervisor, DNR, 5/1/01). Wildlife waste is transported over land surfaces during rainfall events or may be directly deposited by animals into streams. The high percentage of permeable surfaces in forested areas increases the infiltration rate over the watershed area. This process ultimately reduces the runoff reaching streams by overland flow and reduces the significance of fecal coliform contributions transported over land.

3.2.2 Agricultural Activities and Grazing Animals

Agricultural land can be a source of fecal coliform bacteria. Runoff from pastures, improper land application of animal wastes, livestock operations, and livestock with

access to waterbodies are all agricultural sources of fecal coliform bacteria. Agricultural best management practices (BMPs) such as buffer strips, alternative watering sources, limiting livestock access to streams, and the proper land application of animal wastes reduce fecal coliform bacteria loading to waterbodies.

The number of animals in the watershed, shown in Table 3-4, was estimated by area-weighting the 1997 USDA census data over the watershed area for both Greenville and Laurens counties. Census data show that grazing cattle are of more relevance in the Rabon Creek watershed than confined animal operations. Livestock, except for dairy cattle, are not usually confined and are typically grazing in the pastures where deposited manure is a source of nonpoint pollution. The time that cattle spend instreams is assumed to be 0.15 percent of their total gazing time. Hogs are anticipated to be generally confined, where as sheep are expected to spend all of their time grazing. Horses and ponies are expected to spend the majority of spring, summer, and fall months grazing in pastureland where manure is a source of nonpoint pollution.

Table 3-4 1997 USDA Agricultural Census Data Animal Estimates

Animal	1997 Census Estimate
Beef Cow	2040
Dairy Cow	268
Hog	31
Sheep	17
Horses and Ponies	164

3.2.3 Failing Septic Systems

Failing septic systems represent a nonpoint source that can contribute fecal coliform bacteria to receiving waterbodies through surface or subsurface malfunctions. Based on 1990 census information, population change from 1990 and 2000, and assuming an average of 2.5 people per household (U.S. Census, 2000), greater than 16,000 people in the 127 square mile Rabon Creek watershed use septic systems. Though the precise failure rate is unknown, Schueler (1999) suggests an average septic failure rate of 20 percent.

4.0 TECHNICAL APPROACH – LOAD-DURATION METHOD

Load-duration curves were developed for water quality stations in the Rabon Creek watershed to establish allowable fecal coliform bacteria loads under various hydrologic conditions. The load-duration methodology uses the cumulative frequency distribution of streamflow and pollutant concentration (fecal coliform bacteria) data to estimate the allowable loads for a waterbody. Allowable load-duration curves were established in the Rabon Creek watershed using the instantaneous concentration of fecal coliform bacteria, minus a five percent margin of safety (MOS), and streamflow measured at USGS station 02165200, South Rabon Creek near Gray Court, as shown in Figure 1-1.

USGS station 02165200 is located 2.16 miles downstream of water quality station S-322, draining an area with land use activities distributed similarly to the monitoring stations drainage areas. Due to limited flow data in the watershed, flows were determined by area-weighted data collected at USGS station 02165200. Streamflow data were collected at USGS 02165200 from 1967 through 1981 and again from 1990 through 2001. The extensive period of record and similar watershed characteristics provided confidence in the decision to develop an area-weighted flow relationship between USGS station 02165200 and impaired monitoring stations. Figure 4-1 illustrates the water yield for impaired stations in the Rabon Creek watershed.

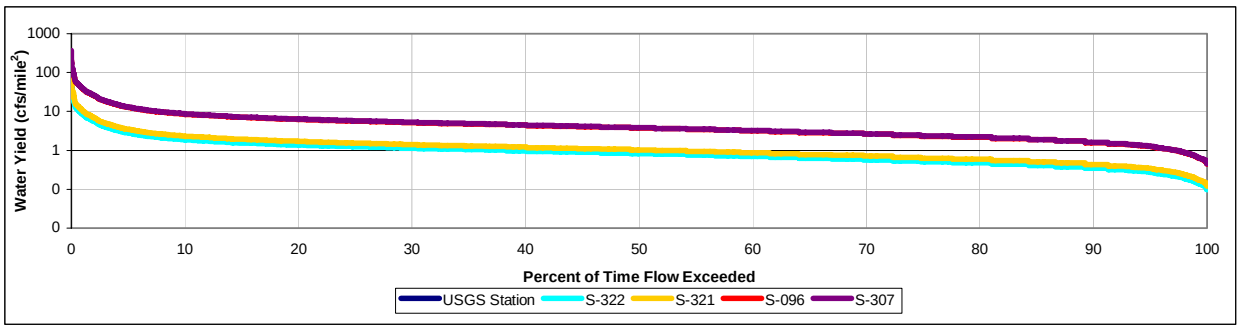

Figure 4-1 Water Yield (cubic feet per second per square mile) Based on Measured Daily Streamflow from USGS Station 02165200

After calculating streamflow for each impaired monitoring station the data were ranked to determine the percent of time a streamflow was exceeded. The streamflow was then multiplied by a concentration of 380 counts/100 mL (based on the instantaneous concentration and a five percent MOS) to generate a load-duration curve for each impaired station. The result of the load-duration curve is the TMDL target.

To define the TMDL for each station, an average of the load-duration curve was calculated. The average was calculated using loads at five percent intervals from the 10^{th} percentile of flow is exceeded to the 90^{th} percentile of flow is exceeded. Loads occurring at less than the 10^{th} percentile of flow exceeded are extreme high flow events and the data collected at greater than the 90^{th} percentile of flow exceeded are extreme low flow event and therefore were not considered in developing the TMDL. Loads established at intervals and the mean load for each station can be found in Tables B-1 through B-4 of the Appendix B.

5.0 DEVELOPMENT OF TOTAL MAXIMUM DAILY LOAD

A total maximum daily load (TMDL) for a given pollutant and waterbody is comprised of the sum of individual wasteload allocations (WLAs) for point sources, and load allocations (LAs) for both nonpoint sources and natural background levels. In addition, the TMDL must include a margin of safety (MOS), either implicitly or explicitly, to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody. Conceptually, this definition is represented by the equation:

$$TMDL = \sum WLAs + \sum LAs + MOS$$

The TMDL is the total amount of a pollutant that can be assimilated by the receiving waterbody while still achieving water quality standards. In TMDL development, allowable loadings from all pollutant sources that cumulatively amount to no more than the TMDL must be established and thereby provide the basis to establish water quality-based controls. For some pollutants, TMDLs are expressed on a mass loading basis (e.g., pounds per day). For bacteria, however, TMDLs can be expressed in terms of organism counts (or resulting concentration), in accordance with 40 CFR 130.2(l).

5.1 Critical Conditions

Critical conditions for fecal coliform bacteria in the Rabon Creek watershed occur at various flow regimes. The load-duration curve methodology used to establish TMDLs in the watershed considers various hydrologic conditions critical in maintaining water quality standards.

5.2 Existing Load

The existing load for each impaired station was established using observed fecal coliform bacteria data and area-weighted streamflow generated for the day the data were collected. The data violating the instantaneous concentration were isolated. The measured data occurring at less than the 10^{th} percentile of flow exceeded is an extreme high flow event and the data collected at greater than the 90^{th} percentile of flow exceeded is an extreme low flow event and therefore not considered as critical conditions for the TMDL.

Of violating data collected at S-322, S-321, and S-096, a best-fit trendline was fit to violating data. The power trend line was determined using a best-fit relationship that was most representative of the violating data. The equation representing the trendline was then used to calculate the average violating load that occurred between the 10^{th} and 90^{th} percentile, at every fifth percentile. This average load is equal to the existing fecal coliform load at the associated station.

Figure 5-1 presents the power best-fit trendline for S-322, the impaired station on South Rabon Creek. Intervals for existing loads are presented in Tables B-5 through B-7 and power trendlines are presented for S-321 and S-096 in Figures B-1 and B-2 of Appendix B. Existing loads calculated for each station are listed in Table 5-1.

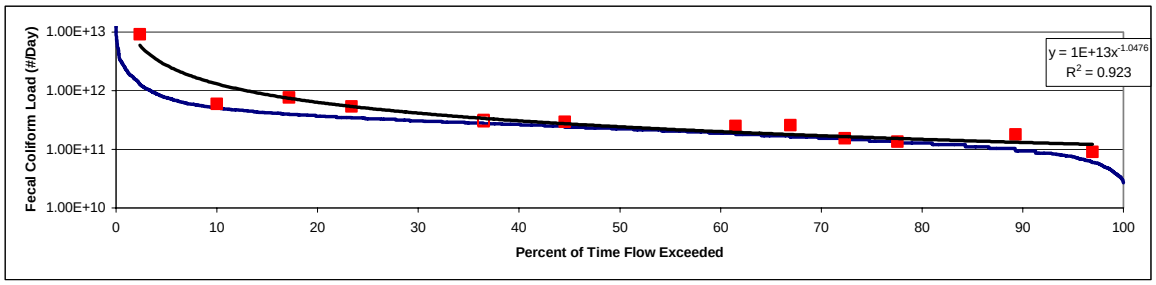

Figure 5-1 Power Trendline Generated from Violating Fecal Coliform Bacteria Measured Between the 10th and 90th Percent of Flow Exceeded at S-322

Table 5-1 Existing Loads for Impaired Water Quality Stations in the Rabon Creek Watershed (03050109-130)

Station ID	Existing LA (counts/day)
S-322	2.51E+11
S-321	7.27E+11
S-096	3.14E+12
S-307 or CL-051	NA

5.3 Existing Wasteload

The existing wasteload was calculated for S & S Washerette. The facility was assumed to discharge at a design flow of 0.0023 mgd and at permitted limits of fecal coliform bacteria equal to the State criteria for both instantaneous and geometric mean loads. In South Carolina, NPDES permittees that discharge sanitary wastewater must meet the State criteria for fecal coliform bacteria at the point of discharge (i.e. a daily maximum concentration of 400 counts per 100 mL, and a 30-day geometric mean of 200 counts per 100 mL). The facility is not in exceedance of the fecal coliform bacteria water quality criteria, and therefore, was not considered to be a major contributing source. This assumption was derived from DMR data provided by South Carolina (refer to Table 3-2). Allowable TMDL wasteloads are equal to loads calculated for this facility, as shown in Table 5-2.

Table 5-2 Wasteloads from NPDES Continuous Discharges to Impaired Water Quality Stations in the Rabon Creek Watershed (03050109-130)

Station ID	Existing WLA Continuous (counts/day)
S-322	NA
S-321	3.48E+07
S-096	3.48E+07
S-307 or CL-051	3.48E+07

The MS4 permitted area is a very small portion of the Rabon Creek watershed headwaters. Limited information was available to determine the survival rate of fecal coliform bacteria leaving the MS4 area to establish the impact from these areas on the impaired water quality stations. Therefore, for the purpose of fecal coliform bacteria TMDL development in the Rabon Creek watershed, reductions to watersheds with MS4 permitted discharges will be consistent with the overall load reduction to the impaired water quality station.

5.4 Margin of Safety

There are two methods for incorporating a margin of safety (MOS) in the analysis: a) by implicitly incorporating the MOS using conservative assumptions to develop allocations; or b) by explicitly specifying a portion of the TMDL as the MOS and using the remainder for allocations. For the Rabon Creek TMDLs, both methods were applied to incorporate a MOS. An implicit MOS was incorporated through the use of conservative assumptions in developing the TMDL, such as the use of the maximum permitted quantity from NPDES facilities and averaging the power trend of measured violations. A five percent explicit MOS was reserved from the water quality criteria in developing the load-duration curves. Specifically, the water quality target was set at 190 counts per 100 mL for the geometric mean 30-day period and 380 counts per 100 mL for the instantaneous criterion, which is five percent lower than the water quality criteria of 200 and 400 counts per 100 mL, respectively.

5.5 Total Maximum Daily Load

The TMDL represents the maximum fecal coliform bacteria load the stream may carry and still meet water quality standards. The TMDL is presented in fecal coliform counts to be protective of both the instantaneous, per day, and geometric mean, per 30-day, criteria. Table 5-3 defines the fecal coliform bacteria total maximum daily load for protection of water quality standards for impaired stations in the Rabon Creek watershed.

The one NPDES continuous discharger will receive an unchanged WLA. Greenville County and the towns of Fountain Inn and Simpsonville have or will have NPDES MS4 permits. All the designated areas will eventually be covered under one or more NPDES phase II stormwater permits. The reduction percentages in this TMDL apply also to the fecal coliform waste load attributable to those areas of the watershed which are covered or will be covered under NPDES MS4 (Municipal Separate Storm Sewer System)

permits. Compliance by these municipalities with the terms of their individual MS4 permits will fulfill any obligations they have towards implementing this TMDL.

Table 5-3 Total Maximum Daily Loads for Impaired Water Quality Stations in the Rabon Creek Watershed (03050109-130)

on	Existing WasteLoad	TMDL WLA		Existing Load	TMDL LA	MOS	TMDL[3]	Percent Reduction[4]
	Continuous (counts/day)	Continuous[1] (counts/day)	MS4[2] (counts/day)	(counts/day)	(counts/day)	(counts/day)	(counts/day)	
2	NA	NA	3%	2.51E+11	2.30E+11	1.28E+10	2.43E+11	3%
1	3.48E+07	3.48E+07	58%	7.27E+11	2.87E+11	1.60E+10	3.03E+11	58%
6	3.48E+07	3.48E+07	NA	3.14E+12	1.05E+12	5.85E+10	1.11E+12	65%
7[5]	3.48E+07	3.48E+07	NA	NA[5]	1.07E+12	5.97E+10	1.13E+12	NA

Table Notes:

1. Sources meeting any new pathogen standard at end of pipe will be considered to be in compliance with this TMDL.
2. MS4 expressed as % reduction equal to LA reduction.
3. TMDLs expressed as monthly load by station is: S-322 3.65E+12 counts/30-day; S-321 4.55E+12 counts/30-day; S-096 1.67E+13 counts/30-day; and S-307 1.70E+13 counts/30-day.
4. Percent reduction applies to LA and MS4 components.
5. The load allocated at S-307 is addressed through the TMDL at S-096 and expected reductions presented for S-096.

6.0 IMPLEMENTATION

As discussed in the *Implementation Plan for Achieving Total Maximum Daily Load Reductions From Nonpoint Sources for the State of South Carolina* (SCDHEC,1998), South Carolina has several tools available for implementing this nonpoint source TMDL. Specifically, SCDHEC's animal agriculture permitting program addresses animal operations and land application of animal wastes. In addition, SCDHEC will work with the existing agencies in the area to provide nonpoint source education in the Rabon Creek Watershed. Local sources of nonpoint source education and assistance include Clemson Extension Service, the Natural Resource Conservation Service (NRCS), the Greenville and Laurens Counties Soil and Water Conservation Services, and the South Carolina Department of Natural Resources. Clemson Extension Service offers a 'Farm-A-Syst' package to farmers. Farm-A-Syst allows the farmer to evaluate practices on their property and determine the nonpoint source impact they may be having. It recommends best management practices (BMPs) to correct nonpoint source problems on the farm. NRCS can provide cost share money to land owners installing BMPs.

SCDHEC is empowered under the State Pollution Control Act to perform investigations of and pursue enforcement for activities and conditions which threaten the quality of waters of the state.

The iterative BMP approach as defined in the general storm water NPDES MS4 permit is expected to provide significant implementation of this TMDL. Discovery and removal of illicit storm drain cross connection is one important element of the storm water NPDES permit. Public nonpoint source pollution education is another.

In addition, other interested parties (universities, local watershed groups, etc.) may apply for section 319 grants to install BMPs that will reduce fecal coliform loading to Rabon Creek. TMDL implementation projects are given highest priority for 319 funding.

In addition to the resources cited above for the implementation of this TMDL in the Rabon Creek Watershed, Clemson Extension has developed a Home-A-Syst handbook that can help urban or rural homeowners reduce sources of NPS pollution on their property. This document guides homeowners through a self-assessment, including information on proper maintenance practices for septic tanks. SCDHEC also employs a nonpoint source educator who can assist with distribution of these tools as well as provide additional BMP information.

Using existing authorities and mechanisms, these measures will be implemented in the Rabon Creek Watershed in order to bring about a 3 – 65 % reduction in fecal coliform bacteria loading to the creeks. DHEC will continue to monitor, according to the basin monitoring schedule, the effectiveness of implementation measures and evaluate stream water quality as the implementation strategy progresses.

7.0 REFERENCES

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APPENDIX A Data

Table A-1 Percent of Watershed Area Aggregated by Land Use Class for Areas Draining to Streamflow and Water Quality Monitoring Stations in the Rabon Creek Watershed

Aggregated Land Use Class	S-322	S-321	USGS02165200	S-313	S-312	S-296	S-096	S-307
Urban	2.2%	3.7%	2.0%	2.7%	1.9%	2.2%	1.6%	1.5%
Barren	0.8%	0.4%	0.8%	0.7%	0.7%	0.7%	1.1%	1.3%
Row Crops	19.9%	16.9%	19.4%	16.0%	18.6%	16.9%	14.2%	13.9%
Pasture	19.6%	21.2%	19.7%	17.8%	19.9%	18.6%	15.6%	15.4%
Forest	56.8%	57.4%	57.5%	62.5%	58.4%	60.9%	66.9%	67.2%
Water	0.7%	0.4%	0.6%	0.3%	0.5%	0.8%	0.6%	0.7%

Table A-2 Fecal Coliform Data Collected Between 1990 and 2001 at Water Quality Monitoring Stations in the Rabon Creek Watershed

S-322	
Date	**Value**
11/18/96	530
12/4/96	600
1/17/97	740
2/4/97	140
3/6/97	450
4/10/97	240
5/16/97	240
6/26/97	210
7/8/97	400
8/19/97	170
9/4/97	720
10/20/97	470
11/13/97	420
12/18/97	180
2/17/98	2700
1/10/01	120
2/21/01	400
3/14/01	440
4/12/01	600
6/8/01	190
7/6/01	160
8/3/01	230
9/14/01	290
10/23/01	120
11/20/01	570
12/20/01	350

S-321	
Date	**Value**
11/18/96	240
12/4/96	160
1/17/97	270
2/4/97	160
3/6/97	290
4/10/97	130
5/16/97	250
6/26/97	2000
7/8/97	180
8/19/97	550
9/4/97	400
10/20/97	140
11/13/97	330
12/18/97	270
2/17/98	5300
1/10/01	530
2/21/01	25
3/14/01	520
4/12/01	390
7/6/01	240
8/3/01	310
9/14/01	390
10/23/01	110
11/20/01	22
12/20/01	440

S-307	
Date	**Value**
5/28/92	5
6/22/92	4
7/23/92	2
9/21/92	22
10/19/92	40
11/21/96	63
12/12/96	16
1/27/97	740
2/7/97	30
3/7/97	82
4/24/97	120
5/27/97	18
6/23/97	2
7/24/97	1400
8/13/97	2
9/29/97	48
10/9/97	4
11/21/97	12
12/18/97	4
1/12/98	230
1/18/01	80
2/12/01	34
3/13/01	190
4/13/01	23
6/6/01	5
7/5/01	17
8/30/01	7
10/11/01	27
11/29/01	35
12/19/01	96

S-312	
Date	**Value**
5/27/92	2
6/24/92	28
7/21/92	2
9/22/92	3
10/29/92	2
5/27/97	14
6/24/97	4
7/15/97	1
8/11/97	2
10/30/97	400
11/12/97	6
12/15/97	6
2/20/98	120
1/18/01	14
2/12/01	6
3/13/01	77
4/13/01	26
5/21/01	2
6/28/01	7
7/18/01	3
8/23/01	*Present <QL
9/13/01	3
10/16/01	2
11/20/01	5
12/18/01	30

S-313	
Date	**Value**
5/27/92	2
6/24/92	1
7/21/92	2
9/22/92	1
10/29/92	2
5/27/97	16
6/24/97	1
7/15/97	7
8/11/97	4
10/30/97	140
11/12/97	5
12/15/97	14
2/20/98	23
1/18/01	*Present <QL
2/12/01	8
3/13/01	92
4/13/01	52
5/21/01	5
6/28/01	33
7/18/01	1
8/23/01	5
9/13/01	22
10/16/01	2
11/20/01	5
12/18/01	100

S-096	
Date	Value
6/4/90	210
7/5/90	270
8/1/90	280
9/4/90	1600
10/2/90	110
5/2/91	200
6/5/91	85
7/18/91	440
8/7/91	75
9/19/91	500
10/21/91	290
5/26/92	120
6/4/92	210
7/10/92	120
8/4/92	100
9/2/92	260
10/5/92	1500
5/26/93	130
6/15/93	67
7/14/93	62
8/3/93	140
9/9/93	6
10/6/93	260
5/27/94	220
6/21/94	74
7/6/94	5600
8/2/94	120
9/6/94	8000
10/12/94	400
5/3/95	220
6/26/95	2000
7/28/95	300
8/9/95	280
9/7/95	240
10/12/95	880
5/10/96	120
6/25/96	120
7/24/96	100
8/13/96	190
9/10/96	242
10/8/96	1000
11/21/96	160
12/4/96	120
1/10/97	1200

S-096	
Date	Value
2/3/97	60
3/7/97	130
4/10/97	55
5/16/97	160
6/30/97	160
7/9/97	160
8/19/97	220
9/4/97	280
10/2/97	200
11/13/97	210
12/18/97	71
1/15/98	250
2/19/98	50
5/7/98	560
6/30/98	840
7/20/98	3000
8/5/98	100
9/1/98	310
10/29/98	100
5/17/99	100
6/2/99	180
7/1/99	84
8/4/99	140
9/2/99	230
10/18/99	190
4/18/00	110
5/13/00	160
5/30/00	75
6/14/00	120
7/11/00	*Present >QL
8/1/00	900
9/11/00	1300
10/17/00	200
1/10/01	220
2/21/01	200
3/14/01	100
4/12/01	86
6/8/01	120
7/6/01	90
8/3/01	98
9/14/01	280
10/23/01	180
11/20/01	48
12/20/01	160

S-296	
Date	Value
1/26/90	32
2/9/90	4
3/9/90	62
4/6/90	2
5/25/90	2
6/21/90	7
7/20/90	5
8/22/90	93
9/4/90	940
10/25/90	34
11/7/90	2
12/13/90	1
1/2/91	3
2/28/91	1
3/19/91	1
4/18/91	2
5/23/91	3
6/26/91	1
7/26/91	1
8/27/91	2
9/30/91	6
10/29/91	1
11/18/91	3
12/6/91	9
3/26/92	2
4/28/92	2
5/27/92	1
6/24/92	4
7/21/92	1
9/22/92	1
10/29/92	4
11/20/92	18
12/18/92	10
1/27/93	140
2/5/93	14
3/4/93	13
4/29/93	1
5/27/93	2
6/11/93	1
7/15/93	1
8/13/93	4
9/24/93	2
10/22/93	32

S-296	
Date	Value
11/18/93	9
12/3/93	1
1/7/94	6
2/2/94	7
3/18/94	1
4/29/94	1
5/6/94	1
6/3/94	4
7/6/94	110
8/5/94	110
9/8/94	1
10/13/94	8
11/17/94	7
12/30/94	130
1/27/95	33
2/27/95	21
3/28/95	2
4/21/95	8
5/23/95	1
6/28/95	7
7/8/95	5
7/18/95	1
9/26/95	3
10/17/95	10
11/6/95	10
12/8/95	3
1/23/96	2
2/2/96	92
3/8/96	420
4/4/96	24
5/2/96	6
6/5/96	3
7/1/96	1
8/8/96	1
9/4/96	3
10/16/96	3
11/21/96	5
12/12/96	6
1/27/97	38
2/7/97	9
3/7/97	99
4/24/97	19
5/27/97	7
6/24/97	1
7/15/97	1

S-296	
Date	Value
8/11/97	1
10/30/97	600
11/12/97	11
12/15/97	7
2/20/98	74
3/5/98	8
4/23/98	150
7/29/98	1
8/28/98	17
9/23/98	1
10/8/98	17
11/23/98	11
12/30/98	72
1/18/99	8
2/10/99	22
3/22/99	1
6/2/99	2
7/1/99	2
10/18/99	8
11/2/99	5
12/14/99	31
1/19/00	10
2/17/00	14
3/15/00	4
4/18/00	2
6/14/00	2
9/11/00	1
10/17/00	2
12/27/00	6
5/21/01	2
6/28/01	9
9/13/01	1
10/16/01	20
4/20/99	*Present <QL
5/17/99	*Present <QL
8/4/99	*Present <QL
9/2/99	*Present <QL
5/30/00	*Present <QL
7/11/00	*Present <QL
8/1/00	*Present <QL
11/1/00	*Present <QL
7/18/01	*Present <QL
8/23/01	*Present <QL

Table A-3 Fecal Coliform Discharge Monitoring Reports at S&S Washerette SC0032298)

NPDES ID	PIPE	Date	Fecal Coliform Bacteria (counts/100 mL)
SC0032298	001	3/1/1991	
SC0032298	001	3/27/1991	
SC0032298	001	6/19/1991	
SC0032298	001	8/16/1991	
SC0032298	001	8/27/1991	<10
SC0032298	001	11/22/1991	
SC0032298	001	3/26/1992	1030
SC0032298	001	6/22/1992	1800
SC0032298	001	12/29/1993	<10
SC0032298	001	12/29/1993	< 10
SC0032298	001	12/29/1993	<10
SC0032298	001	12/29/1993	<10
SC0032298	001	12/29/1993	<10
SC0032298	001	12/29/1993	<10
SC0032298	001	12/29/1993	<10
SC0032298	001	12/29/1993	<10
SC0032298	001	12/29/1993	370
SC0032298	001	12/29/1993	>200
SC0032298	001	12/29/1993	60
SC0032298	001	12/29/1993	<10
SC0032298	001	12/29/1993	<10
SC0032298	001	12/29/1993	<10
SC0032298	001	12/29/1993	<10
SC0032298	001	12/29/1993	<10
SC0032298	001	12/29/1993	<10
SC0032298	001	3/8/1994	<10
SC0032298	001	4/6/1994	<10
SC0032298	001	5/4/1994	30
SC0032298	001	5/31/1994	<10
SC0032298	001	7/1/1994	<10
SC0032298	001	7/27/1994	620
SC0032298	001	8/29/1994	<10
SC0032298	001	8/29/1994	230
SC0032298	001	11/3/1994	510
SC0032298	001	12/2/1994	<10
SC0032298	001	1/3/1995	<1
SC0032298	001	2/2/1995	41
SC0032298	001	3/6/1995	<1
SC0032298	001	4/3/1995	1
SC0032298	001	5/2/1995	<1
SC0032298	001	6/5/1995	285
SC0032298	001	7/10/1995	<1

Table A-4 Discharge Monitoring Reports at S&S Washerette (SC0032298)

NPDES ID	Pipe	Date	Flow (mgd)
SC0032298	1	8/29/94	0.0029
SC0032298	1	11/3/94	0.003
SC0032298	1	12/2/94	0.003
SC0032298	1	1/3/95	0.003
SC0032298	1	2/2/95	0.0028
SC0032298	1	3/6/95	0.003
SC0032298	1	4/3/95	0.003
SC0032298	1	5/2/95	0.002
SC0032298	1	6/5/95	0.003
SC0032298	1	7/10/95	0.003
SC0032298	1	8/3/95	0.003
SC0032298	1	8/31/95	0.003
SC0032298	1	10/4/95	0.002
SC0032298	1	11/2/95	0.0029
SC0032298	1	12/4/95	0.0028
SC0032298	1	1/9/96	0.0029
SC0032298	1	2/2/96	0.002
SC0032298	1	3/4/96	0.003
SC0032298	1	3/28/96	0.003
SC0032298	1	4/26/96	0.003
SC0032298	1	6/4/96	0.003
SC0032298	1	7/5/96	0.003
SC0032298	1	8/5/96	0.003
SC0032298	1	10/7/96	0.0037
SC0032298	1	9/9/96	0.003
SC0032298	1	11/4/96	0.0038
SC0032298	1	12/2/96	0.0031
SC0032298	1	1/9/97	0.003
SC0032298	1	2/3/97	0.003
SC0032298	1	3/7/97	0.003
SC0032298	1	4/3/97	0.0031
SC0032298	1	5/23/97	0.0028
SC0032298	1	6/6/97	0.0028
SC0032298	1	7/7/97	0.003
SC0032298	1	8/4/97	0.0028
SC0032298	1	9/8/97	0.003
SC0032298	1	8/30/97	0.0047
SC0032298	1	9/29/97	0.003

NPDES ID	Pipe	Date	Flow (mgd)
SC0032298	1	12/3/97	0.0023
SC0032298	1	12/30/97	0.0024
SC0032298	1	2/2/98	0.002
SC0032298	1	3/9/98	0.0021
SC0032298	1	3/25/98	0.0025
SC0032298	1	4/30/98	0.002
SC0032298	1	6/8/98	0.002
SC0032298	1	7/2/98	0.0021
SC0032298	1	8/9/98	0.0018
SC0032298	1	8/31/98	0.0022
SC0032298	1	9/28/98	0.002
SC0032298	1	11/4/98	0.0017
SC0032298	1	12/1/98	0.0021
SC0032298	1	1/5/99	0.002
SC0032298	1	2/3/99	0.002
SC0032298	1	3/8/99	0.0017
SC0032298	1	4/5/99	0.0027
SC0032298	1	5/3/99	0.0018
SC0032298	1	6/11/99	0.002
SC0032298	1	6/28/99	0.0019
SC0032298	1	8/6/99	0.0018
SC0032298	1	9/1/99	0.0018
SC0032298	1	10/8/99	0.002
SC0032298	1	11/8/99	0.0019
SC0032298	1	12/6/99	0.002
SC0032298	1	1/4/00	0.0019
SC0032298	1	2/1/00	0.0017
SC0032298	1	3/2/00	0.002
SC0032298	1	4/13/00	0.0016
SC0032298	1	5/1/00	0.0017
SC0032298	1	6/1/00	0.002
SC0032298	1	7/7/00	0.0018
SC0032298	1	8/7/00	0.002
SC0032298	1	9/5/00	0.002
SC0032298	1	10/11/00	0.0021
SC0032298	1	10/25/00	0.002
SC0032298	1	11/30/00	0.0018
SC0032298	1	1/30/01	0.0021
SC0032298	1	2/6/01	0.002

APPENDIX B Calculations

Table B-1 S-322 Allowable Load

Table B-2 S-321 Allowable Load

Station	S-322
Instantaneous Conc. (#/100 ml)	380
Geo. Mean Conc. (#/100 ml)	190

Mean	2.43E+11
Allowable Load (#/day)	2.43E+11
Geometric Mean Load (#/30 days)	3.65E+12

Percent Exceedance (x)	Load (y)
10	5.05E+11
15	4.20E+11
20	3.68E+11
25	3.34E+11
30	3.08E+11
35	2.83E+11
40	2.66E+11
45	2.40E+11
50	2.23E+11
55	2.06E+11
60	1.88E+11
65	1.71E+11
70	1.54E+11
75	1.37E+11
80	1.28E+11
85	1.11E+11
90	9.42E+10

Station	S-321
Instantaneous Conc. (#/100 ml)	380
Geo. Mean Conc. (#/100 ml)	190

Mean	3.03E+11
Allowable Load (#/day)	3.03E+11
Geometric Mean Load (#/30 days)	4.55E+12

Percent Exceedance (x)	Load (y)
10	6.30E+11
15	5.23E+11
20	4.59E+11
25	4.16E+11
30	3.84E+11
35	3.52E+11
40	3.31E+11
45	2.99E+11
50	2.78E+11
55	2.56E+11
60	2.35E+11
65	2.14E+11
70	1.92E+11
75	1.71E+11
80	1.60E+11
85	1.39E+11
90	1.17E+11

Table B-3 S-096 Allowable Load

Station	S-096
Instantaneous Conc. (#/100 ml)	380
Geo. Mean Conc. (#/100 ml)	190

Mean	1.11E+12
Allowable Load (#/day)	1.11E+12
Geometric Mean Load (#/30days)	1.67E+13

Percent Exceedance(x)	Load(y)
10	2.31E+12
15	1.92E+12
20	1.68E+12
25	1.52E+12
30	1.41E+12
35	1.29E+12
40	1.21E+12
45	1.09E+12
50	1.02E+12
55	9.38E+11
60	8.60E+11
65	7.82E+11
70	7.04E+11
75	6.25E+11
80	5.86E+11
85	5.08E+11
90	4.30E+11

Table B-4 S-307 Allowable Load

Station	S-307
Instantaneous Conc. (#/100 ml)	380
Geo. Mean Conc. (#/100 ml)	190

Mean	1.13E+12
Allowable Load (#/day)	1.13E+12
Geometric Mean Load (#/30days)	1.70E+13

Percent Exceedance(x)	Load(y)
10	2.36E+12
15	1.96E+12
20	1.72E+12
25	1.56E+12
30	1.44E+12
35	1.32E+12
40	1.24E+12
45	1.12E+12
50	1.04E+12
55	9.58E+11
60	8.79E+11
65	7.99E+11
70	7.19E+11
75	6.39E+11
80	5.99E+11
85	5.19E+11
90	4.39E+11

Table B-5 S-322 Existing Load

Station:	**S-322**
Trendline:	**Power**
Equation: y=1E+13*X^(-1.0476)	

Existing Load (#/Day):	**2.51E+11**
Average (#/Day):	**2.51E+11**

Percent Exceedance(%)	Load(#/Day)
10	8.96E+11
15	5.86E+11
20	4.34E+11
25	3.43E+11
30	2.84E+11
35	2.41E+11
40	2.10E+11
45	1.85E+11
50	1.66E+11
55	1.50E+11
60	1.37E+11
65	1.26E+11
70	1.17E+11
75	1.09E+11
80	1.01E+11
85	9.52E+10
90	8.97E+10

Table B-6 S-321 Existing Load

Station:	**S-321**
Trendline:	**Power**
Equation: y=9E+13*X^(-1.4052)	

Existing Load (#/Day):	**7.27E+11**
Average (#/Day):	**7.27E+11**

Percent Exceedance(%)	Load(#/Day)
10	3.54E+12
15	2.00E+12
20	1.34E+12
25	9.77E+11
30	7.56E+11
35	6.09E+11
40	5.05E+11
45	4.28E+11
50	3.69E+11
55	3.23E+11
60	2.85E+11
65	2.55E+11
70	2.30E+11
75	2.09E+11
80	1.91E+11
85	1.75E+11
90	1.61E+11

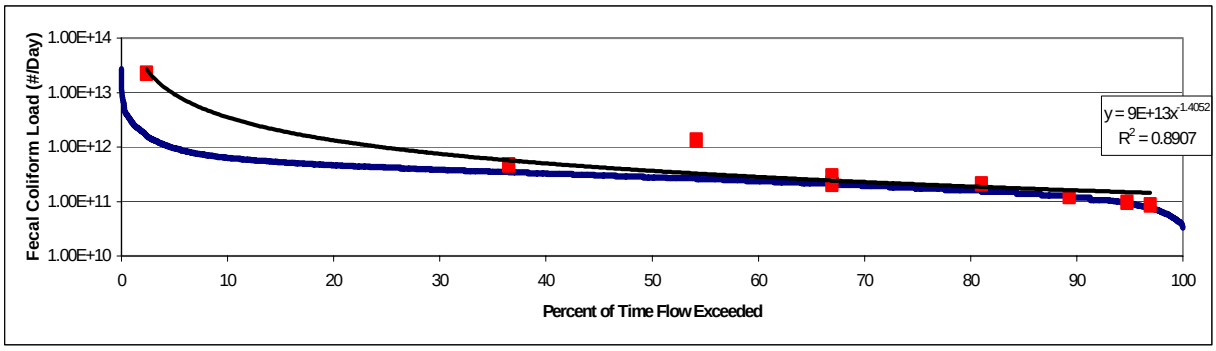

Figure B-1 Power Trendline Generated from Violating Fecal Coliform Bacteria Measured Between the 10th and 90th Percent of Flow Exceeded at S-321

Table B-7 S-096 Existing Load

Station:	**S-096**
Trendline:	**Power**
Equation: y=4E+13*X^(-0.6569)	

Existing Load (#/Day):	**3.14E+12**
Average (#/Day):	**3.14E+12**

Percent Exceedance(%)	Load(#/Day)
10	7.85E+12
15	5.89E+12
20	4.81E+12
25	4.10E+12
30	3.61E+12
35	3.23E+12
40	2.94E+12
45	2.71E+12
50	2.51E+12
55	2.35E+12
60	2.21E+12
65	2.09E+12
70	1.98E+12
75	1.89E+12
80	1.80E+12
85	1.73E+12
90	1.66E+12

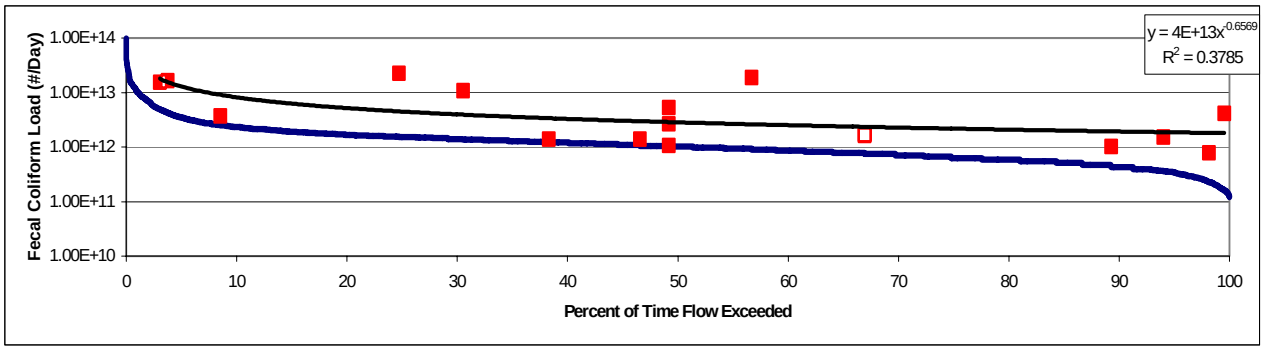

Figure B-2 Power Trendline Generated from Violating Fecal Coliform Bacteria Measured Between the 10th and 90th Percent of Flow Exceeded at S-096

APPENDIX C Public Notification

PUBLIC NOTICE
U.S. Environmental Protection Agency, Region 4
Water Management Division
61 Forsyth Street, S.W.
Atlanta, GA 30303-8960
NOTICE OF AVAILABILITY
TOTAL MAXIMUM DAILY LOADS (TMDLS)
FOR WATER AND POLLUTANTS IN THE STATE OF SOUTH CAROLINA
Section 303(d)(1)(C) of the Clean Water Act (CWA), 33 U.S.C. §1313(d)(1)(C), and the U.S. Environmental Protection Agency's implementing regulation, 40 CFR §130.7(c)(1), require
the establishment of Total Maximum Daily Loads (TMDLs) for waters identified by states as not
meeting water quality standards under authority of §303(d)(1)(A) of the CWA. These TMDLs
are to be established levels necessary to implement applicable water quality standards with
seasonal variations and a margin of safety, accounting for lack of knowledge concerning the
relationship between pollutant loading and water quality.
The waterbody impairments on South Carolina's 303(d) list that will be addressed by the TMDLs are listed below. These impaired waterbodies are located in the Rabon Creek Watershed
near Greenville, South Carolina.
List ID Impairment Description Waterbody Name
SC-S-307 Fecal Coliform LAKE GREENWOOD, RABON CK ARM, .8 KM N RD S-30-307
SC-S-321 Fecal Coliform NORTH RABON CK AT S-30-32
SC-S-096 Fecal Coliform RABON CK AT S-30-54 8.8 MI NW CROSS HILL
SC-S-322 Fecal Coliform SOUTH RABON CK ON DIRT RD BETWEEN SC 101 & S-31-76
Persons wishing to comment on the proposed TMDLs or to offer new data or information regarding the proposed TMDLs are invited to submit the same in writing no later than August
16, 2004 to the U.S. Environmental Protection Agency, Region 4, Water Management Division,
61 Forsyth Street, S.W., Atlanta, Georgia 30303-8960, ATTENTION: Ms. Sibyl Cole, Standards, Monitoring, and TMDL Branch.
A copy of the proposed TMDLs can be obtained through the Internet or by contacting Ms.
Cole at (404) 562-9437 or via electronic mail at cole.sibyl@epa.gov. The URL address for the
proposed TMDLs is: http://www.epa.gov/region4/water/tmdl/tennessee/index.htm#sc.
The proposed TMDLs and supporting documents, including technical information, data, and

analyses, may be reviewed at 61 Forsyth Street, S.W., Atlanta, Georgia, between the hours of
8:00 AM and 3:00 PM, Monday through Friday. Persons wishing to review this information
should contact Ms. Cole to schedule a time for that review.
/s/ _____ July 16, 2004_____
James D. Giattina, Director Date
Water Management Division
Region 4
U.S. Environmental Protection Agency

NO COMMENTS RECEIVED