ANDERSON COUNTY

TMDL MONITORING AND ASSESSMENT PLAN
Upper Savannah River Watershed

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January 2015

PREPARED IN ACCORDANCE WITH SCDHEC PERMIT #SCR030000

Table of Contents

***Table of Contents follows section numbers of #SCR030000.**

List of Tables

List of Acronyms and Abbreviations

CFU	Colony Forming Units
MEP	Maximum Extent Practicable
MPN	Most Probable Number
POC	Pollutant of Concern
SCDHEC	South Carolina Department of Health and Environmental Control
TMDL	Total Maximum Daily Load
WLA	Wasteload Allocation
WQMS	Water Quality Monitoring Stations
WWTP	Waste Water Treatment Plant

ANDERSON COUNTY
TMDL MONITORING AND ASSESSMENT PLAN
UPPER SAVANNAH RIVER WATERSHED

The following monitoring and assessment plan was developed to meet the requirements of Section 3 of SCDHEC SMS4 permit number SCR030000.

3.2 TMDL Monitoring and Assessment

3.2.1 Introduction

A Total Maximum Daily Load (TMDL) has been developed for fecal coliform bacteria in the Upper Savannah River Basin, which includes portions of the urbanized area within Anderson County. The TMDL became effective in July 2005 and includes waste load allocations (WLA) for non-point source runoff that thereby includes these urbanized areas. The Anderson County SMS4 operates in a very small portion of the overall TMDL watershed. Due to this fact, and in order to best use their resources, the County has decided to use data from a representative watershed instead of monitoring in the Upper Savannah watershed itself. Due to the recent change in preferred indicator bacteria by SCDHEC from fecal coliform bacteria to *Escherichia coli* (*E. coli*) for fresh water, the proposed pollutant of concern (POC) to be sampled by the County at a representative location(s) within the urbanized area of the Upper Saluda River watershed is *E. coli*.

3.2.1.2 Monitoring Plan Requirements

3.2.1.2.1.b Requirements to Monitor the Pollutants of Concern

As stated in Permit Number SCR030000, the following topics will be addressed in Table 1 and Table 2.

i. Samples and measurements taken for the purpose of the TMDL Monitoring Plan shall:
   (1) Be representative of the SMS4 discharges,
   (2) Be reasonably distributed in time, while maintaining representative sampling,
   (3) Not be terminated for the purpose of preventing the analysis results from a permit or water quality violation,
   (4) Describe and consider frequency, mass and/or rate of discharge, as appropriate, and,
   (5) Be expressed in terms of units or measurements consistent with the requirements contained in the WLA.

ii. The information contained in the TMDL Monitoring Plan shall include:
   (1) Monitoring locations, appropriate for representative data collection,
   (2) Explanation of why monitoring is being conducted for selected locations,
   (3) A description of whether the location(s) are representative and contribute to pollutant loads,
   (4) An indication the seasons during which sampling is intended,
   (5) The pollutant of concern, or its surrogate(s), as a sampling parameter,
   (6) Description of the sampling equipment, and,
   (7) A rationale supporting the proposed monitored location(s) as reflective of water quality concerns to the Maximum Extent Practicable (MEP).

3.2.1.2.1.b.i-ii Monitoring and Assessment Plan Details

Table 1: Monitoring Plan Details

3.2.1.2.1.b.ii.(1) Monitoring location(s) and details on site selection:
Anderson County SMS4 operates in a very small portion of the overall Upper Savannah TMDL watershed. To conserve program resources and make the best use of funds, Anderson County elected to substitute monitoring efforts in the Savannah with a representative TMDL watershed. The Cely Road crossing of Big Brushy Creek in the Upper Saluda River Watershed is the most representative of conditions in the Upper Savannah River watershed. This location will serve as the monitoring location for the Upper Savannah TMDL watershed. A map of the selected monitoring location can be found in Appendix A and more information on the specific site is listed in the sections below.
3.2.1.2.1.b.ii.(2) Explanation of why monitoring is being conducted for selected locations:
Land area associated with the Anderson County SMS4 only makes up just over 0.7% of the Upper Savannah River TMDL watershed. Based on this small percentage and similar landuse to the land area to be monitored in the Upper Saluda River Watershed, SCDHEC has indicated the County may use a representative watershed to estimate TMDL pollutant loadings in the Upper Savannah River Watershed. The Upper Saluda River Basin is similar in size and land use cover, and it is representative of the County's urbanized area in both watersheds. This makes it the most representative site, compared to other locations, to compare data while avoiding inputs from other NPDES permittees. Data from monitoring efforts in the Upper Saluda River Basin will be analyzed and interpreted to develop values for the regulated TMDL watershed.
3.2.1.2.1.b.ii.(3) Description of the location(s) and whether they are representative of the MS4 discharge and contribute to pollutant loads:
The monitoring location at the Cely Road crossing of Big Brushy Creek was selected because it best represents the County's urbanized area in each watershed. See Table 4 in Appendix B for a comparison of land use data between the Upper Saluda River Basin and the Upper Savannah River watersheds.
3.2.1.2.1.b.ii.(4) Indication of the seasons during which sampling is intended:
Multiple samples will be collected for each storm event at least once per season. Seasons will be described as: Winter: December 1 to February 30 Spring: March 1 to May 30 Summer: June 1 to August 30 Fall: September 1 to November 30 Samples taken for each storm event will be reasonably distributed in time, pending appropriate weather conditions, watershed hydrologic response, and sample holding times.

3.2.1.2.1.b.ii.(5) The pollutant of concern, or its surrogate(s), as a sampling parameter:
Due to the recent change in preferred indicator bacteria by SCDHEC, from fecal coliform bacteria to *E. Coli* for fresh water, the proposed pollutant of concern (POC) to be sampled by the County is *E. coli*. *E. coli* samples will be collected at the Cely Road crossing of Big Brushy Creek.
3.2.1.2.1.b.ii.(6) Description of the sampling equipment:
The County will use sealed, sterile sample bottles provided by a contracted, SCDHEC certified laboratory to collect manual grab samples.
3.2.1.2.1.b.ii.(7) Rationale supporting the proposed monitored location(s):
Regardless of the location selected for sampling, the contributing watershed will always include sources of bacteria that are unrelated to the MS4 and are not within the authority of the MS4 to control. However, as discussed above in 3.2.1.2.1.b.ii.(3), due to the size of the watershed, the overall landuse makeup, the proposed location will be reflective of the urbanized contributions to the MEP within Anderson County's urbanized area.

Table 2 discusses how samples and measurements taken for the purpose of the TMDL Monitoring Plan shall meet the five points listed in section 3.2.1.2.1.b.i of the SMS4 permit number SCR030000.

Table 2: 3.2.1.2.1.b.i

3.2.1.2.1.b.i.1 Be representative of the SMS4 discharges:
The proposed sampling location will provide representative data from the MS4, as 100% of the watershed draining to the sampling location is County urbanized area.
3.2.1.2.1.b.i.2 Be reasonably distributed in time, while maintaining representative sampling:
Multiple samples will be collected during each event, distributed through time, to characterize each sampled event. Samples will be collected, at a minimum, once per season per year. Samples will be collected during various sized storm events so that different flow rates and storm events are characterized, to the MEP.
3.2.1.2.1.b.i.3 Not be terminated for the purpose of preventing the analysis results from a permit or water quality violation:
Anderson County will not terminate sampling for the purpose of preventing the analysis results from a permit or water quality violation.
3.2.1.2.1.b.i.4 Describe and consider frequency, mass and/or rate of discharge, as appropriate:
Anderson County will record flow depth at the time of sample collection as a surrogate for estimating flow volume between samples.
3.2.1.2.1.b.i.5 Be expressed in terms of units or measurements consistent with the requirements contained in the WLA:
Sample concentrations for *E. coli* will be provided by the laboratory and expressed as MPN/100 mL. The County will utilize guidance from SCDHEC to convert the Upper Savannah Watershed TMDL targeted loads from fecal coliform to E. coli for comparison to the sampled concentrations and approximated loads. E. coli sample concentrations will be expressed by the certified laboratory as MPN/100 mL.

3.2.1.2.1.b.iii Monitoring and Assessment Plan Strategy

The TMDL monitoring plan for Anderson County is focused on E. coli. Samples and measurements collected will be used to characterize the quality and quantity of the permitted discharges to evaluate the progress toward the WLA and/or WQS attainment. In order to do this, Anderson County will implement the following strategies to the MEP:

- ☑ In-stream monitoring
- ☐ Outfall monitoring.

The monitoring location(s) discussed above in Table 2 was selected based on the following checked boxes: Monitoring locations must include one/all/a combination of the following

- ☐ % MS4 area draining to the WQMS, at least 25%,
- ☑ Collection of a representative contributing watershed,
- ☐ Inclusion of the entire TMDL watershed within the MS4.

Table 3 discusses how samples and measurements taken for the purpose of the TMDL Monitoring Plan shall meet the requirements of 3.2.1.2.1.b.iv-x of the SMS4 permit number SCR030000.

Table 3: 3.2.1.2.1.b.iv-x

3.2.1.2.1.b.vi Method Descriptions:
No field testing is required for this sample. Sample collection and transport procedures are approved under 40 CFR 136.
3.2.1.2.1.b.vii When no approved analytical method is used:
Not applicable
3.2.1.2.1.b.viii Sampling minimum:
For each monitoring location, samples of stormwater discharges shall be collected at a minimum of once per season per year.
3.2.1.2.1.b.ix Sample analysis:
Samples collected for laboratory analysis shall be analyzed for E. coli (the POC).
3.2.1.2.1.b.x Tidal waters:
Not applicable

3.2.1.2.1.d Reporting

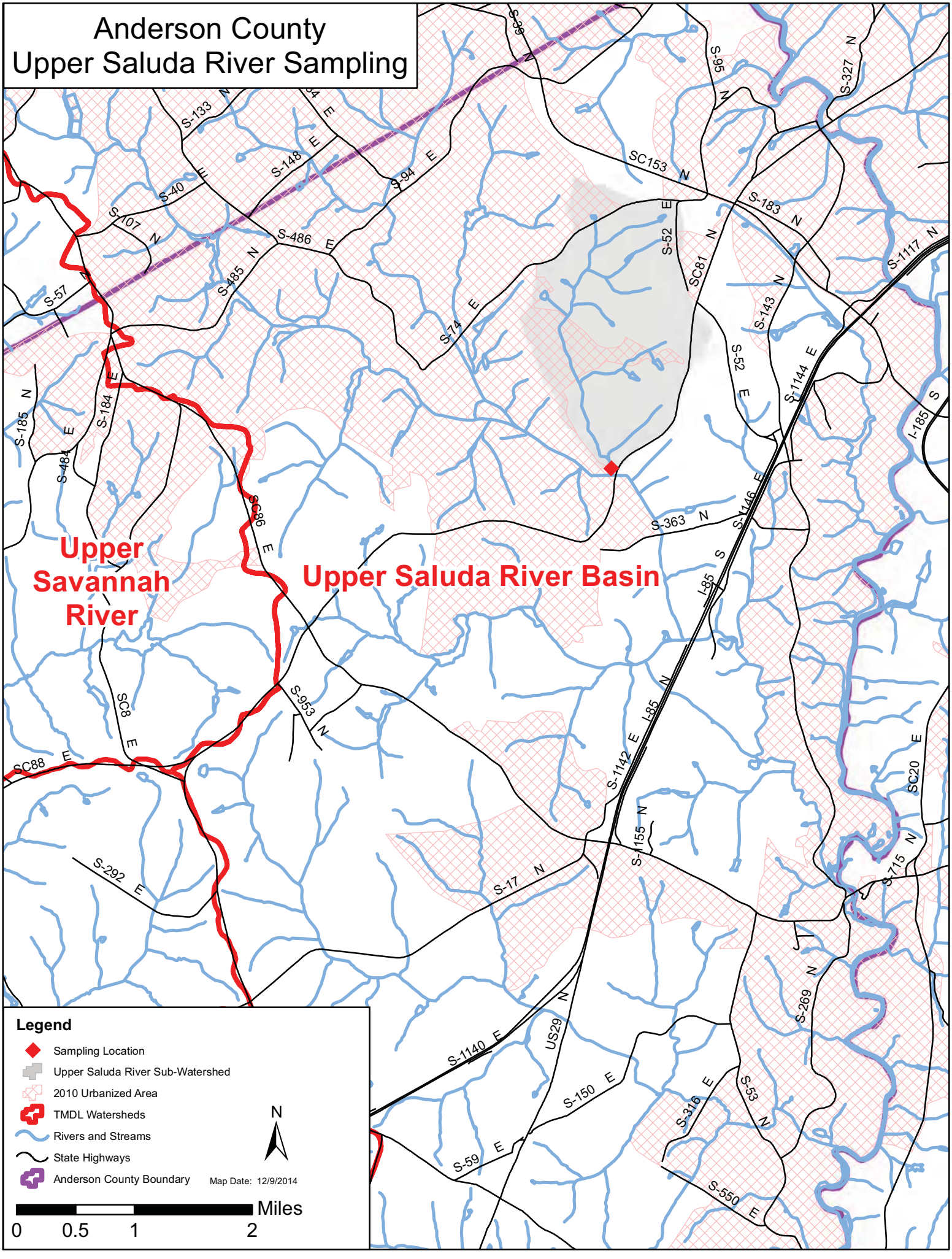
Anderson County will report on the progress of the characterization of the POC to the Upper Savannah River Watershed. Resulting data will be included in every annual report following the commencement of monitoring for TMDL pollutant characterization.

Appendix A

Anderson County

Upper Savannah River Watershed

Monitoring Site Map


Anderson County
Upper Saluda River Sampling
Upper Savannah River
Upper Saluda River Basin
S-133 N
S-148 E
S-40 E
S-107 N
S-486 E
S-485 N
S-57
S-94 E
S-74 E
S-39 N
S-95 N
S-327 N
SC153 N
S-183 N
S-52 E
SC81 N
S-1117 N
S-143 N
S-52 E
S-1144 E
I-185 S
S-185 N
S-184 E
S-484 E
SC86 E
S-363 N
S-1146 E
I-85 S
I-85 N
S-953 N
SC8 E
SC88 E
S-1142 E
S-1155 N
SC20 E
S-715 N
S-292 E
S-17 N
S-269 N
US29 N
S-1140 E
S-150 E
S-316 E
S-53 N
S-59 E
S-550 E
Legend
Sampling Location
Upper Saluda River Sub-Watershed
2010 Urbanized Area
TMDL Watersheds
Rivers and Streams
State Highways
Anderson County Boundary
Map Date: 12/9/2014
N
Miles
0
0.5
1
2

Appendix B

Anderson County

Upper Savannah River Watershed

Surrogate Watershed Comparison

Representative Watersheds	Overall TMDL Watershed (sq miles)	Anderson County Square Miles	Other MS4 in Anderson Co (sq miles)	% Deciduous Forest	% Mixed Forest	% Developed Open Space	% Developed Low Intensity	% Developed Medium Intensity	% Developed High Intensity
Upper Savannah River	645.2	111.02	5.24	29	0.46	11	3	0.79	0.24
Upper Saluda River	479.03	79.02	32.92	37	0.55	28	8	1.12	0