Final

Total Maximum Daily Load (TMDL)

for

Boggy Branch

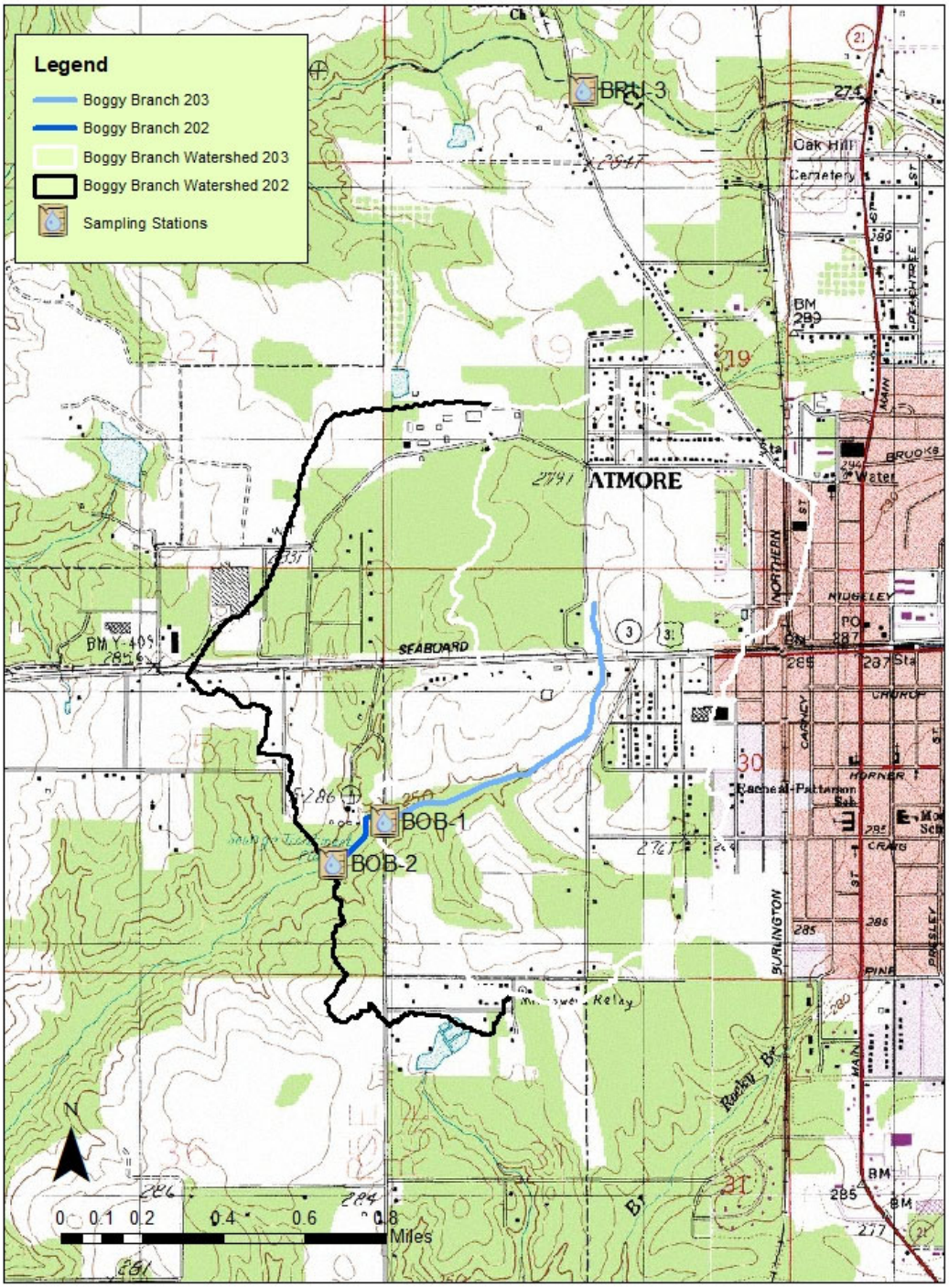
Assessment Unit IDs AL03140106-0302-202 and AL03140106-0302-203

Escambia County

Pathogens (*E. coli*)

Alabama Department of Environmental Management
Water Quality Branch
Water Division
August 2022

Figure 1: Boggy Branch Watershed



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Figures and Tables

1.0 Executive Summary

Section 303(d) of the Clean Water Act and EPA's Water Quality Planning and Management Regulations (40 CFR Part 130) require states to identify waterbodies which are not meeting their designated uses and to determine the Total Maximum Daily Load (TMDL) for pollutants causing the use impairment. A TMDL is the sum of individual wasteload allocations for point sources (WLAs), load allocations (LAs) for nonpoint sources including natural background levels, and a margin of safety (MOS).

Boggy Branch forms in Escambia County and is part of the Perdido River basin. It flows south for approximately 2.68 miles until it merges with Brushy Creek near the Florida state line. This TMDL addresses two segments of Boggy Branch – AL03140106-0302-202 and AL03140106-0302-203. The segment of Boggy Branch from its source to the Masland Carpets outfall will be referred to as 203 in reference to the last three digits of its assessment unit. The segment from the Masland Carpets outfall to the Atmore WWTP outfall, which is located near Atmore, Alabama, will be referred to as 202. The total drainage area for these segments of Boggy Branch is approximately 1.62 square miles. The use classification for both segments is Fish & Wildlife.

Boggy Branch was first included on the §303(d) list for pathogens in 2016 based on data collected in 2014 by the Alabama Department of Environmental Management (ADEM), which indicated an impairment for pathogens (*E. coli*). Data collected at stations on the two segments of Boggy Branch were found to exceed the *E. coli* single sample water quality criterion and the geometric mean criterion.

In 2021, §303(d) sampling studies were performed by ADEM on Boggy Branch to further assess the water quality of the impaired stream. For purposes of this TMDL, the 2021 data will be used to assess the water quality of Boggy Branch because it is the most current data and provides the best picture of the current water quality conditions of the stream. The January 2022 edition of *Alabama's Water Quality Assessment and Listing Methodology*, prepared by ADEM, provides the rationale for the Department to use the most recent data to prepare a TMDL for an impaired waterbody. ADEM collected 17 samples from each of the pathogen-impaired segments of Boggy Branch in 2021. According to the data collected, Boggy Branch was not meeting the pathogen criteria applicable to its use classification of Fish and Wildlife.

A mass balance approach was used for calculating the pathogen TMDL for Boggy Branch. The mass balance approach utilizes the conservation of mass principle. The TMDL was calculated using the single sample or geometric mean sample exceedance event which resulted in the highest percent reduction. Existing loads were calculated by multiplying the *E. coli* concentrations times the respective in-stream flows and a conversion factor. In the same manner as existing loads were calculated, allowable loads were calculated for the single sample *E. coli* target of 268.2 colonies/100 ml (235 colonies/100 ml – 10% Margin of Safety) and geometric mean *E. coli* target of 113.4 colonies/100 ml (126 colonies/100 ml – 10% Margin of Safety).

In this case, it was determined that the highest percent reduction for each segment was calculated from single sample *E. coli* violations measured on July 5, 2021. The violations call for reductions of 89% for segment 203 and 94% for segment 202.

Table 1 is a summary of the estimated existing loads, allowable loads, and percent reductions for the single sample criterion and geometric mean criterion for segment 203. Table 2 is the same for segment 202. Tables 3 and 4 list the TMDL for each segment, defined as the maximum allowable *E. coli* loading under critical conditions for Boggy Branch.

Table 1: *E. coli* Load and Required Reduction for AL03140106-0302-203

Source	Existing Load (colonies/day)	Allowable Load (colonies/day)	Required Reduction (colonies/day)	% Reduction
Single Sample Load	1.47E+12	1.63E+11	1.31E+12	89%
Geometric Mean Load	2.27E+09	1.72E+09	5.54E+08	24%

Table 2: *E. coli* Load and Required Reduction for AL03140106-0302-202

Source	Existing Load (colonies/day)	Allowable Load (colonies/day)	Required Reduction (colonies/day)	% Reduction
Single Sample Load	4.71E+12	2.61E+11	4.45E+12	94%
Geometric Mean Load	7.00E+9	4.94E+9	2.06E+9	29%

Table 3: *E. coli* TMDL for Boggy Branch AL03140106-0302-203

TMDL[e]	Margin of Safety (MOS)	Waste Load Allocation (WLA)[a]			Load Allocation (LA)	
		WWTPs[b]	MS4s[c]	Leaking Collection Systems[d]		
(col/day)	(col/day)	(col/day)	% reduction	(col/day)	(col/day)	% reduction
1.81E+11	1.81E+10	NA	NA	0	1.63E+11	89%

NA = Not applicable

a. There are no CAFOs in the Boggy Branch watershed. Future CAFOs will be assigned a waste load allocation (WLA) of zero.

b. Future WWTPs must meet the applicable in-stream water quality criteria for pathogens at the point of discharge.

c. Future MS4 areas would be required to demonstrate consistency with the assumptions and requirements of this TMDL.

d. The objective for leaking collection systems is a WLA of zero. It is recognized, however, that a WLA of 0 colonies/day may not be practical. For these sources, the WLA is interpreted to mean a reduction in *E. coli* loading to the maximum extent practicable, consistent with the requirement that these sources not contribute to a violation of the water quality criteria for *E. coli*.

e. TMDL was established using the single sample *E. coli* criterion of 298 colonies/100ml.

Table 4: *E. coli* TMDL for Boggy Branch AL03140106-0302-202

TMDL[e]	Margin of Safety (MOS)	Waste Load Allocation (WLA)[a]			Load Allocation (LA)	
		WWTPs[b]	MS4s[c]	Leaking Collection Systems[d]		
(col/day)	(col/day)	(col/day)	% reduction	(col/day)	(col/day)	% reduction
2.90E+11	2.90E+10	NA	NA	0	2.61E+11	94%

NA = Not applicable
a. There are no CAFOs in the Boggy Branch watershed. Future CAFOs will be assigned a waste load allocation (WLA) of zero.
b. Future WWTPs must meet the applicable in-stream water quality criteria for pathogens at the point of discharge.
c. Future MS4 areas would be required to demonstrate consistency with the assumptions and requirements of this TMDL.
d. The objective for leaking collection systems is a WLA of zero. It is recognized, however, that a WLA of 0 colonies/day may not be practical. For these sources, the WLA is interpreted to mean a reduction in *E. coli* loading to the maximum extent practicable, consistent with the requirement that these sources not contribute to a violation of the water quality criteria for *E. coli*.
e. TMDL was established using the single sample *E. coli* criterion of 298 colonies/100ml.

Compliance with the terms and conditions of existing and future NPDES permits will effectively implement the WLA and demonstrate consistency with the assumptions and requirements of the TMDL. Required load reductions in the LA portion of this TMDL can be implemented through voluntary measures and may be eligible for CWA §319 grants.

The Department recognizes that adaptive implementation of this TMDL will be needed to achieve applicable water quality criteria and we are committed towards targeting the load reductions to improve water quality in the Boggy Branch watershed. As additional data and/or information become available, it may become necessary to revise and/or modify the TMDL accordingly.

2.0 Basis for §303(d) Listing

2.1 Introduction

Section 303(d) of the Clean Water Act and EPA's Water Quality Planning and Management Regulations (40 CFR Part 130) require states to identify waterbodies which are not meeting their designated uses and to determine the total maximum daily load (TMDL) for pollutants causing use impairment. The TMDL process establishes the allowable loading of pollutants for a waterbody based on the relationship between pollution sources and in-stream water quality conditions, so that states can establish water-quality based controls to reduce pollution and restore and maintain the quality of their water resources (USEPA, 1991).

The State of Alabama has identified two segments of Boggy Branch as impaired for pathogens: assessment units AL03140106-0320-202 (from the old Masland Carpets outfall to the Atmore WWTP outfall) and AL03140106-0320-203 (from the source to the old Masland Carpets outfall). For simplicity's sake, these will be referred to as 202 and 203 for the remainder of the document. The §303(d) listing was originally reported on Alabama's 2016 List of Impaired Waters based on data collected in 2014 and was included on all subsequent lists. The sources of the impairment on the 2020 §303(d) list are collection system failure and urban runoff/storm sewers.

2.2 Problem Definition

Waterbody Impaired:	Boggy Branch – from its source to the Atmore WWTP outfall
Impaired Reach Length:	0.95 miles (segment 203) and 0.14 miles (segment 202)
Impaired Drainage Area:	1.62 square miles
Water Quality Standard Violation:	Pathogens (Single Sample Maximum, Geometric Mean)
Pollutant of Concern:	Pathogens (*E. coli*)
Water Use Classification:	Fish and Wildlife

Usage Related to Classification:
The impaired stream segments are classified as Fish and Wildlife. Usage of waters in the Fish and Wildlife classification is described in ADEM Admin. Code R. 335-6-10-.09(5)(a), (b), (c), and (d).

> *(a) Best usage of waters: fishing, propagation of fish, aquatic life, and wildlife.*
>
> *(b) Conditions related to best usage: the waters will be suitable for fish, aquatic life and wildlife propagation. The quality of salt and estuarine waters to which this classification is assigned will also be suitable for the propagation of shrimp and crabs.*
>
> *(c) Other usage of waters: it is recognized that the waters may be used for incidental water contact year-round and whole body water-contact recreation during the months of May through October, except that water contact is strongly discouraged in the vicinity of discharges or other conditions beyond the control of the Department or the Alabama Department of Public Health.*
>
> *(d) Conditions related to other usage: the waters, under proper sanitary supervision by the controlling health authorities, will meet accepted standards of water quality for outdoor swimming areas and will be considered satisfactory for swimming and other whole body water-contact sports.*

E. coli Criteria:
Criteria for acceptable bacteria levels for the Fish and Wildlife classification are described in ADEM Admin. Code R. 335-6-10-.09(5)(e)7(i) and (ii) as follows:

> *Bacteria:*
>
> *(i) In non-coastal waters, bacteria of the E. coli group shall not exceed a geometric mean of 548 colonies/100 ml; nor exceed a maximum of 2,507 colonies/100 ml in any sample. In coastal waters,*

bacteria of the enterococci group shall not exceed a maximum of 275 colonies/100 ml in any sample. The geometric mean shall be calculated from no less than five samples collected at a given station over a 30-day period at intervals not less than 24 hours.

(ii) For incidental water contact and whole body water-contact recreation during the months of May through October, the bacterial quality of water is acceptable when a sanitary survey by the controlling health authorities reveals no source of dangerous pollution and when the geometric mean E. coli organism density does not exceed 126 colonies/100 ml nor exceed a maximum of 298 colonies/100 ml in any sample in non-coastal waters. In coastal waters, bacteria of the enterococci group shall not exceed a geometric mean of 35 colonies/100 ml nor exceed a maximum of 158 colonies/100 ml in any sample. The geometric mean shall be calculated from no less than five samples collected at a given station over a 30-day period at intervals not less than 24 hours. When the geometric bacterial coliform organism density exceeds these levels, the bacterial water quality shall be considered acceptable only if a second detailed sanitary survey and evaluation discloses no significant public health risk in the use of the waters. Waters in the immediate vicinity of discharges of sewage or other wastes likely to contain bacteria harmful to humans, regardless of the degree of treatment afforded these wastes, are not acceptable for swimming or other whole body water-contact sports.

Criteria Exceeded:

Records at ADEM stations BOB-1 and BOB-2 from 2014 show that the geometric mean *E. coli* criterion was exceeded at each station. There was also a single sample exceedance at BOB-2 in 2014. The 2014 data is provided in Table 5 below.

Table 5: 303(d) Listing Data

Station	Date	E. coli (col/100 ml)	Geometric Mean (col/100 ml)
BOB-1	4/24/2014	21.8	
BOB-1	5/22/2014	61.3	
BOB-1	6/12/2014	197.6	
BOB-1	6/17/2014	81.3	
BOB-1	6/19/2014	193.5	108.3
BOB-1	6/24/2014	151.5	
BOB-1	7/10/2014	31.6	
BOB-1	8/21/2014	159.7	
BOB-1	8/26/2014	248.1	
BOB-1	8/28/2014	272.3	133.9
BOB-1	9/4/2014	123.6	
BOB-1	9/18/2014	32.3	
BOB-1	10/29/2014	19.9	
BOB-1	11/19/2014	24.6	
BOB-2	4/24/2014	137.6	
BOB-2	5/22/2014	95.9	
BOB-2	6/12/2014	210	
BOB-2	6/17/2014	165	
BOB-2	6/19/2014	159.7	211.2
BOB-2	6/24/2014	613.1	
BOB-2	7/10/2014	124	
BOB-2	8/21/2014	121.1	
BOB-2	8/26/2014	90.6	
BOB-2	8/28/2014	75.9	94.3
BOB-2	9/4/2014	85.7	
BOB-2	9/18/2014	104.3	
BOB-2	10/29/2014	98.7	
BOB-2	11/19/2014	209.8	

3.0 Technical Basis for TMDL Development

3.1 Water Quality Target Identification

For the purpose of this TMDL, a single sample maximum *E. coli* target of 268.2 colonies/100 ml will be used. This target was derived by using a 10% explicit margin of safety from the single sample maximum criterion of 298 colonies/100 ml. This target is considered protective of water quality standards and should

not allow the single sample maximum of 298 colonies/100 ml to be exceeded. In addition, a geometric mean target of 113.4 colonies/100 ml will be used for a series of five samples taken at least 24 hours apart over the course of 30 days. This target was also derived by using a 10% explicit margin of safety from the geometric mean criterion of 126 colonies/100 ml. This target is considered protective of water quality standards and should not allow the geometric mean criterion to be exceeded.

3.2 Source Assessment

3.2.1 Point Sources in the Boggy Branch Watershed

A point source can be defined as a discernible, confined, and discrete conveyance from which pollutants are or may be discharged to surface waters. Point source contributions can typically be attributed to municipal wastewater facilities, illicit discharges, and leaking sewer systems in urban areas. Municipal wastewater treatment facilities are permitted through the National Pollutant Discharge Elimination System (NPDES) process administered by ADEM. In urban settings, sewer lines typically run parallel to streams in the floodplain. If a leaking sewer line is present, high concentrations of bacteria can flow into the stream or leach into the groundwater. Illicit discharges are found at facilities that are discharging bacteria when not permitted, or when the pathogens criterion established in the issued NPDES permit is not being upheld.

Continuous Point Sources

There are currently no NPDES-permitted facilities in the watershed of the pathogen-impaired reach of Boggy Branch. The discharge from the Atmore WWTP is listed as the downstream end location of segment 202 and is therefore not included in this TMDL.

Any future NPDES-regulated continuous discharges that are considered by the Department to be a pathogen source will be required to meet the in-stream water quality criteria for pathogens at the point of discharge.

Non-Continuous Point Sources

The watershed for the impaired segments of Boggy Branch contains no Concentrated Animal Feeding Operations (CAFOs) or Voluntary Animal Feeding Operations (AFOs). Currently the ADEM AFO/CAFO rules prohibit discharges of pollutants from the facilities and their associated land application activities. As a result, future AFOs/CAFOs will receive a waste load allocation of zero.

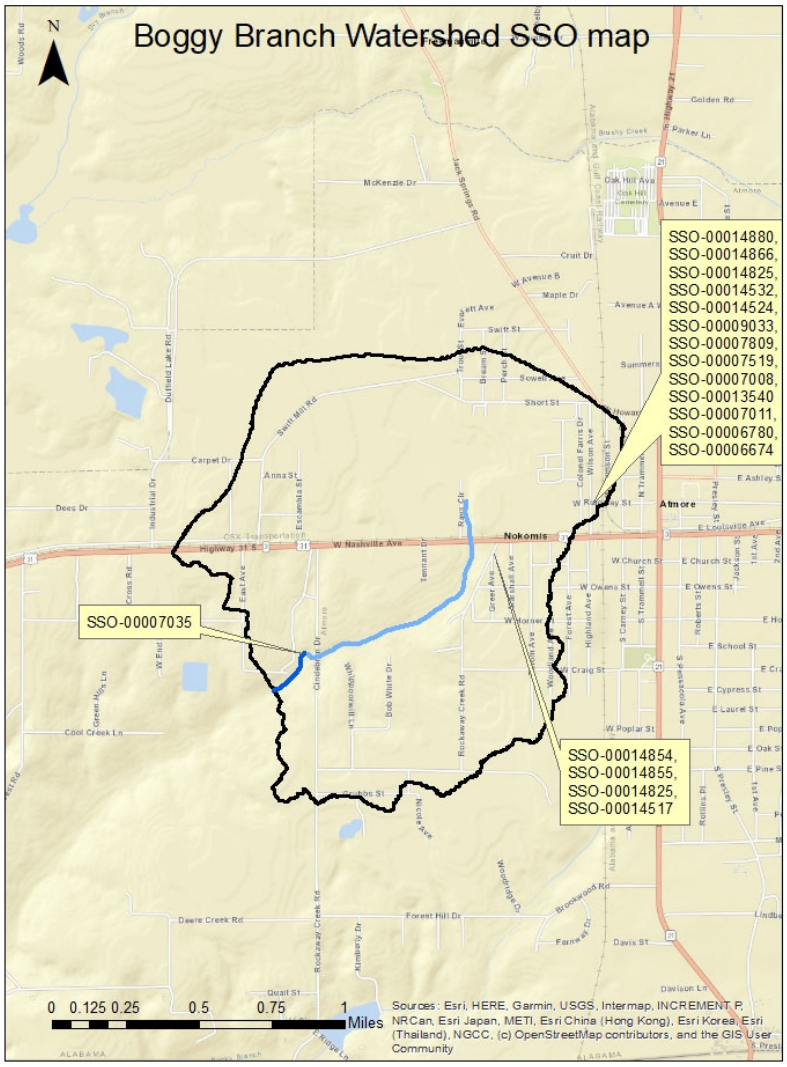
There are currently no NPDES storm water dischargers within this portion of the Boggy Branch watershed permitted to discharge pathogens.

Polluted storm water runoff is commonly transported through Municipal Separate Storm Sewer Systems (MS4s), from which it is often discharged untreated into local waterbodies. To prevent harmful pollutants from being washed or dumped into an MS4, operators must obtain an NPDES permit and develop a storm water management program. Currently, there are no MS4 areas located within this portion of the Boggy Branch watershed. Future MS4s will be required to demonstrate consistency with the assumptions and requirements of this TMDL.

Sanitary sewer overflows (SSOs) have the potential to severely impact water quality and can often result in the violation of water quality standards. It is the responsibility of the NPDES wastewater discharger or collection system operator for non-permitted "collection only" systems to ensure that releases do not occur. Unfortunately, releases to surface waters from SSOs are not always preventable or reported.

From review of ADEM files it was found that numerous SSOs have been reported in the watershed in recent years. During 2017-2021, there were eighteen SSOs related to the Atmore WWTP reported in the Boggy Branch watershed. The numerous SSOs are considered a source of pathogens to Boggy Branch. A map showing the locations of the SSOs in the watershed is included below. Reports of the SSOs in the watershed are included in the appendix.

Figure 2: Boggy Branch SSO map



3.2.2 Nonpoint Sources in the Boggy Branch Watershed

Nonpoint sources of bacteria do not have a defined discharge point, but rather occur over the entire length of a stream or waterbody. On the land surface, bacteria can accumulate over time and be washed into streams or waterbodies during rain events. Therefore, there is some net loading of bacteria into streams as dictated by the watershed hydrology.

Land use in this watershed is primarily developed and forest. Approximate land use proportions for segment 203 are 42% developed and 32% forested, with the remaining 26% further delineated below. Approximate land use proportions for segment 202 are 41% developed and 31% forested, with the remaining 28% further delineated below.

E. coli loading from developed areas is potentially attributable to multiple sources including storm water runoff, unpermitted discharges of wastewater, runoff from improper disposal of waste materials, failing septic tanks, and domestic animals. On-site septic systems may be direct or indirect sources of bacterial pollution via ground and surface waters due to system failures and malfunctions.

E. coli bacteria can also originate from forested areas due to the presence of wild animals such as deer, raccoons, turkey, waterfowl, etc. Wildlife will deposit feces onto land surfaces, where it can be transported during rainfall events to nearby streams. Control of these sources is usually limited to land management BMPs and may be impracticable in most cases. As a result, forested areas are not specifically targeted in this TMDL.

Agricultural land can be a source of *E. coli* bacteria. Runoff from pastures, animal feeding areas, improper land application of animal wastes, and animals with direct access to streams are all mechanisms that can contribute bacteria to waterbodies.

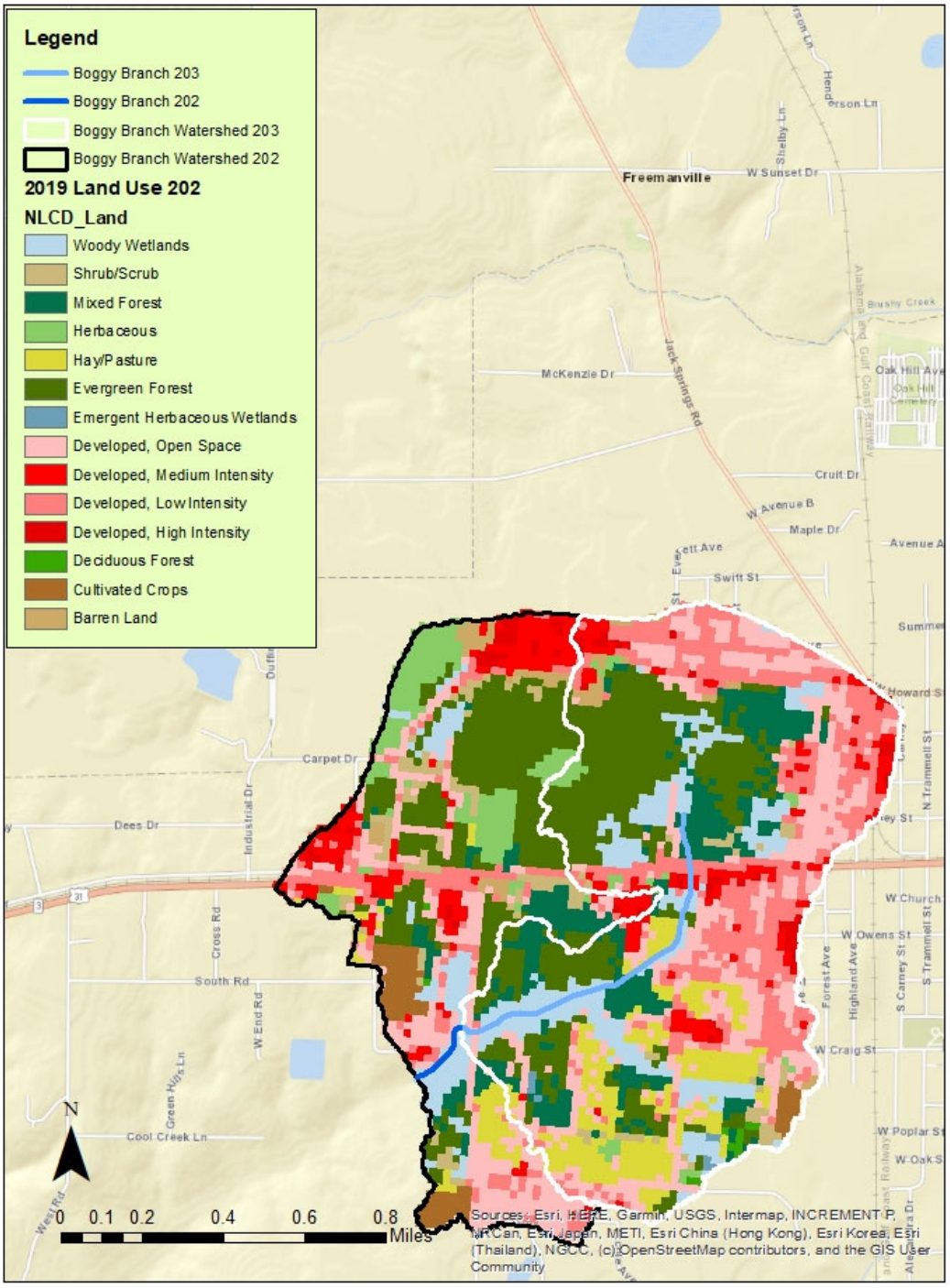
3.3 Land Use Assessment

Land use for the Boggy Branch watershed was determined using ArcMap with land use datasets derived from the 2019 National Land Cover Dataset (NLCD). Table 6 depicts the primary land uses in the Boggy Branch watershed. Figure 3 displays the land use areas for the Boggy Branch watershed. The majority of the Boggy Branch 203 watershed is developed (approximately 42%) and forested (approximately 32%). This is also true with the 202 watershed, which is about 41% developed and 31% forested.

Table 6: Land Use in the Boggy Branch Watershed

Land Use	Miles^2 202	Acres 202	Percent 202	Miles^2 203	Acres 203	Percent 203
Developed, Open Space	0.29	186.2	17.92%	0.20	127.8	18.42%
Developed, Low Intensity	0.24	150.5	14.48%	0.20	124.9	18.01%
Developed, Medium Intensity	0.11	69.0	6.64%	0.05	31.8	4.58%
Developed, High Intensity	0.03	17.8	1.71%	0.01	9.3	1.34%
Barren Land	0.02	15.3	1.47%	0.01	6.4	0.93%
Deciduous Forest	0.00	2.7	0.26%	0.00	2.4	0.34%
Evergreen Forest	0.36	227.8	21.92%	0.22	143.5	20.70%
Mixed Forest	0.14	91.9	8.84%	0.12	76.7	11.05%
Shrub/Scrub	0.05	32.2	3.10%	0.02	11.7	1.69%
Herbaceous	0.08	48.2	4.64%	0.01	9.6	1.38%
Hay/Pasture	0.12	74.8	7.20%	0.10	66.9	9.64%
Cultivated Crops	0.04	23.5	2.26%	0.01	4.1	0.59%
Woody Wetlands	0.15	97.2	9.36%	0.12	76.7	11.05%
Emergent Herbaceous Wetlands	0.00	2.0	0.19%	0.00	1.9	0.28%
Totals->	**1.62**	**1039.1**	**100%**	**1.08**	**693.6**	**100%**
Class Description	**Miles^2 202**	**Acres 202**	**Percent 202**	**Miles^2 203**	**Acres 203**	**Percent 203**
Developed	0.66	436.6	40.76%	0.46	293.8	42.36%
Forest	0.50	322.3	31.02%	0.35	222.6	32.09%
Agriculture	0.15	98.3	9.46%	0.11	70.9	10.23%
Other	0.30	194.9	18.76%	0.17	106.3	15.32%
Totals->	**1.62**	**1039.1**	**100%**	**1.08**	**693.6**	**100%**

Figure 3: Land Use in the Boggy Branch Watershed



3.4 Linkage between Numeric Targets and Sources

The Boggy Branch watershed has three main land uses, namely developed land, forest/natural, and agriculture. Pollutant loadings from forested areas tend to be low due to their filtering capabilities and will be considered as background conditions. The most likely sources of pathogen loadings in the Boggy Branch watershed are sanitary sewer system failures and urban runoff. Pollutant loadings from the agricultural land uses may also be contributing to the pathogen impairment. It is not considered a logical approach to calculate individual components for nonpoint source loadings. Hence, there will not be individual loads or reductions calculated for the various nonpoint sources. The loadings and reductions will only be calculated as a single total nonpoint source load and reduction.

3.5 Data Availability and Analysis

ADEM collected water quality data for Boggy Branch at two stations (BOB-1 and BOB-2) along the impaired reaches from January 2021 to October 2021. Station BOB-1 is located at the bottom of segment 203 while station BOB-2 is located at the bottom of segment 202. Seventeen *E. coli* samples were collected at each station in 2021. Intensive bacteria studies were conducted at each station in May/June 2021 and September/October 2021. A geometric mean was calculated from each of these studies.

Table 7: Station Information

Station	Latitude	Longitude	Location Description
BOB-1	31.017586	-87.513569	Boggy Branch at Cinderbrand Road
BOB-2	31.016103	-87.51559	Boggy Branch approx. 150 feet upstream of the Atmore WWTP discharge and approx. 600 feet downstream of Masland discharge

Single sample violations occurred at BOB-1 on May 26, 2021, July 5, 2021, and October 7, 2021. In addition, the geometric mean criterion was exceeded during both intensive bacteria studies at this station. Single sample violations occurred at BOB-2 on July 5, 2021, and October 7, 2021. The geometric mean criterion was exceeded during the September/October intensive study at this station.

Table 8: ADEM Water Quality Data for BOB-1

Station	Visit Date/Time	Flow (cfs)	E. coli (col/100ml)	Laboratory Qualifier Code*	E. coli Geometric Mean (col/100ml)
BOB-1	1/13/2021 14:15	0.8	10.9	H	
BOB-1	2/17/2021 13:30	0.9	59.4	H	
BOB-1	3/22/2021 12:49	1.2	65	H	
BOB-1	4/6/2021 13:07	0.8	17.3	H	
BOB-1	5/11/2021 12:07	0.7	129.1	H	
BOB-1	5/25/2021 11:36	0.6	85.5		
BOB-1	5/26/2021 11:38	0.6	1046.2		149.9
BOB-1	5/27/2021 11:40	0.7	88.2		
BOB-1	6/2/2021 11:11	0.7	139		
BOB-1	6/16/2021 9:29	0.5	69		
BOB-1	7/5/2021 14:25	24.8	2419.6	GH	
BOB-1	8/3/2021 15:26	0.7	72.7	H	
BOB-1	9/9/2021 10:48	1	185		
BOB-1	9/13/2021 13:02	1	63		
BOB-1	9/28/2021 10:22	0.8	85		130.0
BOB-1	9/29/2021 10:24	0.9	110		
BOB-1	10/7/2021 10:37	1.4	341		

*G = The amount of analyte is above an acceptable level for quantitation and is likely higher than the reported value.
*H = The analytical holding times for analysis are exceeded.

Table 9: ADEM Water Quality Data for BOB-2

Station	Visit Date/Time	Flow (cfs)	E. coli (col/100ml)	Laboratory Qualifier Code*	E. coli Geometric Mean (col/100ml)
BOB-2	1/13/2021 13:10	1	40.8	H	
BOB-2	2/17/2021 13:13	1.9	272.3	H	
BOB-2	3/22/2021 12:11	1.1	111.9	H	
BOB-2	4/6/2021 12:07	1.3	36.8	H	
BOB-2	5/11/2021 11:30	1.4	228.2	H	
BOB-2	5/25/2021 10:45	1.1	83.6		
BOB-2	5/26/2021 10:49	1.1	67.6		65.7
BOB-2	5/27/2021 11:05	1.1	71.8		
BOB-2	6/2/2021 10:45	1.1	71		
BOB-2	6/16/2021 8:55	1.1	42.6		
BOB-2	7/5/2021 13:25	-	4839.2	GH	
BOB-2	8/3/2021 14:42	1.2	56.3	H	
BOB-2	9/9/2021 9:52	1.6	134		
BOB-2	9/13/2021 12:13	1.4	98		
BOB-2	9/28/2021 9:46	1.3	169		160.8
BOB-2	9/29/2021 9:59	1.3	148		
BOB-2	10/7/2021 9:56	3.3	327		

*G = The amount of analyte is above an acceptable level for quantitation and is likely higher than the reported value.
*H = The analytical holding times for analysis are exceeded.

The violation events which resulted in the highest percentage reduction were selected as the basis for this TMDL. For segment 203, this violation occurred on July 5, 2021 at station BOB-1, with an *E. coli* concentration of 2419.6 col/100 ml and a flow of 24.8 cfs. For segment 202, this violation occurred on July 5, 2021 at station BOB-2, with an *E. coli* concentration of 4839.2 col/100 ml and a flow estimated at 39.8 cfs. This flow was calculated by taking the measured flow at BOB-1 on the same day and multiplying it by the ratio of the station drainage areas.

3.6 Critical Conditions/Seasonal Variation

Critical conditions typically occur during the summer months (May-October). This can be explained by the nature of storm events in the summer versus the winter. In summer, periods of dry weather interspersed with thunderstorms allow for the accumulation and washing off of bacteria into streams, resulting in spikes of bacteria counts. In winter, frequent low intensity rain events are more typical and do not allow for the build-up of bacteria on the land surface, resulting in a more uniform loading rate.

Boggy Branch generally follows the trends described above for the summer months of May through October. The critical condition for this pathogen TMDL was taken to be the one with the highest *E. coli* single sample exceedance value. That value was 2419.6 colonies/100 ml for segment 203 and occurred on

July 5, 2021, at station BOB-1. A flow of 24.8 cfs was measured for this sampling event. For segment 202, the highest exceedance value was 4839.2 colonies/100 ml and occurred on July 5, 2021, at station BOB-2. A flow of 39.8 cfs was calculated for this sampling event. The use of the highest exceedance to calculate the TMDL is expected to be protective of water quality in these segments of Boggy Branch year-round.

3.7 Margin of Safety

There are two methods for incorporating a Margin of Safety (MOS) in the TMDL analysis: 1) by implicitly incorporating the MOS using conservative model assumptions to develop allocations, or 2) by explicitly specifying a portion of the TMDL as the MOS and using the remainder for allocations.

The MOS accounts for the uncertainty associated with the limited availability of data used in this analysis. An explicit MOS was applied to the TMDL by reducing the appropriate target criterion concentration by ten percent and calculating a mass loading target with measured or calculated flow data. The single sample *E. coli* maximum value of 298 colonies/100 ml was reduced by 10% to 268.2 colonies/100 ml, while the geometric mean criterion was reduced in the same fashion to 113.4 colonies/100 ml.

4.0 TMDL Development

4.1 Definition of a TMDL

A total maximum daily load (TMDL) is the sum of individual wasteload allocations for point sources (WLAs), load allocations (LAs) for nonpoint sources including natural background levels, and a margin of safety (MOS). The margin of safety can be included either explicitly or implicitly and accounts for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody. As discussed earlier, the MOS is explicit in this TMDL. A TMDL can be denoted by the equation:

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

The TMDL is the total amount of pollutant that can be assimilated by the receiving waterbody while achieving water quality standards under critical conditions.

For some pollutants, TMDLs are expressed on a mass loading basis (e.g., pounds per day). However, for pathogens, TMDL loads are typically expressed in terms of organism counts per day (colonies/day), in accordance with 40 CFR 130.2(i).

4.2 Load Calculations

A mass balance approach was used to calculate the *E. coli* TMDL for Boggy Branch. The mass balance approach utilizes the conservation of mass principle. Total mass loads can be calculated by multiplying the *E. coli* concentration times the instream flow times a conversion factor. Existing loads were calculated for the highest geometric mean exceedance and the highest single sample exceedance. In the same manner, allowable loads were calculated for both the single sample criterion and the geometric mean

criterion. There were both single sample and geometric mean violations; the TMDL was based on the violation that produced the highest calculated percent reduction to achieve applicable water quality criteria.

Existing Conditions

The **single sample** mass loading at each station was calculated by multiplying the highest *E. coli* single sample exceedance concentration by the flow from the day of the exceedance. For both stations, this concentration was measured on July 5, 2021. The *E.coli* concentration times the flow and the conversion factor gives the total mass loading (colonies per day) of *E. coli* to Boggy Branch under the single sample exceedance condition.

For Segment 203: Single Sample

$$\frac{24.8\ \text{ft}^3}{\text{s}} \times \frac{2419.6\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{1.47 \times 10^{12}\text{colonies}}{\text{day}}$$

For Segment 202: Single Sample

$$\frac{39.8\ \text{ft}^3}{\text{s}} \times \frac{4839.2\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{4.71 \times 10^{12}\text{colonies}}{\text{day}}$$

The **geometric mean** mass loading was calculated by multiplying the highest geometric mean exceedance concentration times the average of the measured flows taken during the geometric mean sampling period. For BOB-1, this exceedance occurred during the period of May 25, 2021 through June 16, 2021, while for BOB-2, the exceedance occurred during the period of September 13, 2021 through October 7, 2021. The product of the geometric mean concentration, average flow, and conversion factor gives the total mass loading (colonies per day) of *E. coli* to Boggy Branch under the geometric mean exceedance condition.

For Segment 203: Geometric Mean

$$\frac{0.62\ \text{ft}^3}{\text{s}} \times \frac{149.9\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{2.27 \times 10^{9}\text{colonies}}{\text{day}}$$

For Segment 202: Geometric Mean

$$\frac{1.78\ \text{ft}^3}{\text{s}} \times \frac{160.8\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{7.00 \times 10^{9}\text{colonies}}{\text{day}}$$

Allowable Conditions

The **allowable load** for each station was calculated under the same physical conditions as discussed above for the single sample and geometric mean criteria. This was done by taking the product of the flow and

the allowable concentration. This value was then multiplied by the conversion factor to calculate the allowable load.

For the **single sample** *E. coli* target concentration of 268.2 colonies/100 ml, the allowable *E. coli* loading is:

For Segment 203:

$$\frac{24.8\ \text{ft}^3}{\text{s}} \times \frac{268.2\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{1.63 \times 10^{11}\text{colonies}}{\text{day}}$$

For Segment 202:

$$\frac{39.8\ \text{ft}^3}{\text{s}} \times \frac{268.2\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{2.61 \times 10^{11}\text{colonies}}{\text{day}}$$

For the **geometric mean** *E. coli* target concentration of 113.4 colonies/100 ml, the allowable *E. coli* loading is:

For Segment 203:

$$\frac{0.62\ \text{ft}^3}{\text{s}} \times \frac{113.4\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{1.72 \times 10^{9}\text{colonies}}{\text{day}}$$

For Segment 202:

$$\frac{1.78\ \text{ft}^3}{\text{s}} \times \frac{113.4\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{4.94 \times 10^{9}\text{colonies}}{\text{day}}$$

The explicit margin of safety of 29.8 colonies/100 ml for the **single sample** equals a daily loading of:

For Segment 203:

$$\frac{24.8\ \text{ft}^3}{\text{s}} \times \frac{29.8\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{1.81 \times 10^{10}\text{colonies}}{\text{day}}$$

For Segment 202:

$$\frac{39.8\ \text{ft}^3}{\text{s}} \times \frac{29.8\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{2.90\ \times 10^{10}\text{colonies}}{\text{day}}$$

The explicit margin of safety of 12.6 colonies/100 ml for the **geometric mean** equals a daily loading of:

For Segment 203:

$$\frac{0.62\ \text{ft}^3}{\text{s}} \times \frac{12.6\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{1.91 \times 10^8 \text{colonies}}{\text{day}}$$

For Segment 202:

$$\frac{1.78\ \text{ft}^3}{\text{s}} \times \frac{12.6\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{5.49\ \times 10^8 \text{colonies}}{\text{day}}$$

The difference in the pathogen loading between the existing condition (violation event) and the allowable condition converted to a percent reduction represents the total load reduction needed to achieve the *E. coli* water quality criteria. The TMDL was calculated as the total daily *E. coli* load to Boggy Branch as evaluated at stations BOB-1 and BOB-2. Tables 10 and 11 show the *E. coli* loads and required reductions for the Boggy Branch watershed.

Table 10: *E. coli* Load and Required Reduction for AL03140106-0302-203

Source	Existing Load (colonies/day)	Allowable Load (colonies/day)	Required Reduction (colonies/day)	% Reduction
Single Sample Load	1.47E+12	1.63E+11	1.31E+12	89%
Geometric Mean Load	2.27E+09	1.72E+09	5.54E+08	24%

Table 11: *E. coli* Load and Required Reduction for AL03140106-0302-202

Source	Existing Load (colonies/day)	Allowable Load (colonies/day)	Required Reduction (colonies/day)	% Reduction
Single Sample Load	4.71E+12	2.61E+11	4.45E+12	94%
Geometric Mean Load	7.00E+9	4.94E+9	2.06E+9	29%

From Tables 10 and 11, compliance with the *E. coli* single sample maximum criterion of 298 colonies/100 ml requires a reduction in the *E. coli* load of 89% in segment 202 and 94% in segment 202. The TMDL, WLA, LA and MOS values necessary to achieve the applicable *E. coli* criterion are provided in Tables 12 and 13 below.

Table 12: *E. coli* TMDL for Boggy Branch AL03140106-0302-203

TMDL[e]	Margin of Safety (MOS)	Waste Load Allocation (WLA)[a]			Load Allocation (LA)	
		WWTPs[b]	MS4s[c]	Leaking Collection Systems[d]		
(col/day)	(col/day)	(col/day)	% reduction	(col/day)	(col/day)	% reduction
1.81E+11	1.81E+10	NA	NA	0	1.63E+11	89%

NA = Not applicable
a. There are no CAFOs in the Boggy Branch watershed. Future CAFOs will be assigned a waste load allocation (WLA) of zero.
b. Future WWTPs must meet the applicable in-stream water quality criteria for pathogens at the point of discharge.
c. Future MS4 areas would be required to demonstrate consistency with the assumptions and requirements of this TMDL.
d. The objective for leaking collection systems is a WLA of zero. It is recognized, however, that a WLA of 0 colonies/day may not be practical. For these sources, the WLA is interpreted to mean a reduction in *E. coli* loading to the maximum extent practicable, consistent with the requirement that these sources not contribute to a violation of the water quality criteria for *E. coli*.
e. TMDL was established using the single sample *E. coli* criterion of 298 colonies/100ml.

Table 13: *E. coli* TMDL for the Boggy Branch Segment AL03140106-0302-202

TMDL[e]	Margin of Safety (MOS)	Waste Load Allocation (WLA)[a]			Load Allocation (LA)	
		WWTPs[b]	MS4s[c]	Leaking Collection Systems[d]		
(col/day)	(col/day)	(col/day)	% reduction	(col/day)	(col/day)	% reduction
2.90E+11	2.90E+10	NA	NA	0	2.61E+11	94%

NA = Not applicable
a. There are no CAFOs in the Boggy Branch watershed. Future CAFOs will be assigned a waste load allocation (WLA) of zero.
b. Future WWTPs must meet the applicable in-stream water quality criteria for pathogens at the point of discharge.
c. Future MS4 areas would be required to demonstrate consistency with the assumptions and requirements of this TMDL.
d. The objective for leaking collection systems is a WLA of zero. It is recognized, however, that a WLA of 0 colonies/day may not be practical. For these sources, the WLA is interpreted to mean a reduction in *E. coli* loading to the maximum extent practicable, consistent with the requirement that these sources not contribute to a violation of the water quality criteria for *E. coli*.
e. TMDL was established using the single sample *E. coli* criterion of 298 colonies/100ml.

4.3 TMDL Summary

Boggy Branch was placed on Alabama's §303(d) list for pathogens in 2016 based on data collected by ADEM in 2014. In 2021, ADEM collected water quality data that confirmed the pathogen impairment and provided the basis for TMDL development.

A mass balance approach was used to calculate the *E. coli* TMDL for Boggy Branch. Based on the TMDL analysis, it was determined that *E. coli* reductions of 89% for segment 203 and 94% for segment 202 were necessary to achieve compliance with applicable water quality standards.

Compliance with the terms and conditions of existing and future NPDES sanitary and storm water permits will effectively implement the WLA and demonstrate consistency with the assumptions and requirements of the TMDL.

Required load reductions in the LA portion of this TMDL will be implemented through voluntary measures/best management practices (BMPs). Cooperation and active participation by the general public and various other groups is critical to successful implementation of TMDLs. Local citizen-led and implemented management measures offer the most efficient and comprehensive avenue for reduction of loading rates from nonpoint sources. Therefore, TMDL implementation activities for nonpoint sources will be coordinated through interaction with local entities and may be eligible for CWA §319 grants through the Department's Nonpoint Source Unit.

The Department recognizes that adaptive implementation of this TMDL will be needed to achieve applicable water quality criteria, and we are committed to targeting the load reductions to improve water quality in the Boggy Branch watershed. As additional data and/or information become available, it may become necessary to revise and/or modify the TMDL accordingly.

5.0 Follow-up Monitoring

ADEM has adopted a basin approach to water quality monitoring, an approach that divides Alabama's sixteen major river basins into three groups. Each year, ADEM's water quality resources are concentrated in one of the three basin groups and are divided among multiple priorities including §303(d) listed waterbodies, waterbodies with active TMDLs, and other waterbodies as determined by the Department. Monitoring will help further characterize water quality conditions resulting from the implementation of best management practices and load reductions in the watershed. This monitoring will occur in each basin according the schedule shown in Table 14.

Table 14: Follow-up Monitoring Schedule

River Basin Group	Years to be Monitored
Coosa, Escatawpa, Tennessee (Guntersville), Tombigbee	2022/2025
Alabama, Cahaba, Mobile, Tallapoosa, Tennessee (Pickwick and Wilson)	2023/2026
Black Warrior, Blackwater, Chattahoochee, Chipola, Choctawhatchee, Escambia, Perdido, Tennessee (Wheeler), Yellow	2024/2027

6.0 Public Participation

As part of the public participation process, this TMDL was placed on public notice and made available for review and comment. The public notice was prepared and published in the four major newspapers in Montgomery, Huntsville, Birmingham, and Mobile, as well as submitted to persons who requested to be on ADEM's postal and electronic mailing distributions. In addition, the public notice and subject TMDL

were made available on ADEM's website: www.adem.alabama.gov. The public could also request paper or electronic copies of the TMDL by contacting Ms. Kimberly Minton at 334-271-7826 or kminton@adem.alabama.gov. The public was given an opportunity to review the TMDL and submit comments to the Department in writing. No written comments were received during the public notice period.

7.0 Appendices

7.1 References

ADEM Administrative Code, 2021. Water Division - Water Quality Program, Chapter 335-6-10, Water Quality Criteria.

ADEM Administrative Code, 2021. Water Division - Water Quality Program, Chapter 335-6-11, Use Classifications for Interstate and Intrastate Waters.

Alabama's Monitoring Program. 2014, 2021. ADEM.

Alabama Department of Environmental Management (ADEM), Alabama's Water Quality Assessment and Listing Methodology, January 2022.

Alabama Department of Environmental Management, 2016, 2018, 2020 §303(d) Lists and Fact Sheets. ADEM.

Alabama Department of Environmental Management (ADEM) Laboratory Data Qualification SOP#4910 Revision 7.2, January 2022.

United States Environmental Protection Agency, 1991. Guidance for Water Quality-Based Decisions: The TMDL Process. Office of Water. EPA 440/4-91-001.

United States Environmental Protection Agency, 1986. Quality Criteria for Water. Office of Water. EPA 440/4-91-001.

7.2 Station Photographs

Station BOB-1, Looking Downstream (7/5/2021)

Station BOB-1, Looking Upstream (7/5/2021)

Station BOB-1, Looking Downstream (9/9/2021)

Station BOB-1, Looking Upstream (9/9/2021)

Station BOB-2, Looking Downstream (7/5/2021)

Station BOB-2, Looking Upstream (7/5/2021)

Station BOB-2, Looking Downstream (9/9/2021)

Station BOB-2, Looking Upstream (7/5/2021)

7.3 SSO Reports

SSO Detail Report

Legend

SWA - Swimming Water Affected	CHD - County Health Department	OPI - Other Potential Impacts
AAC - Affected Area Cleaned	SHD - State Health Department	
AAD - Affected Area Disinfected	PWS - Public Water Supply	

40 Results Found

SSO-00014880
31.025500/-87.497700

Received:	Start:	Duration:	Receiving Water: Boggy Branch
9/2/2021	9/2/2021 6:00 A	5Hrs 0Mins	
Notice:	**Stop:**	**Status:**	**Volume:** Range: 1,000 < gallons <=10,000
eSSO	9/2/2021 11:00 A	Completed	

Cause: Heavy rain in short period of time. System wasn.t fully caught up from previous rains associated with Hurricane Ida and

Corrective Actions: None due to system full. Pumps operating at max capacity.

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☑	Manhole: ☑	Ground: ☑	SWA: ☐	Press: ☑-9/2/2021	
Extreme: ☐	Lift Station: ☐	Storm Drain: ☐	AAC: ☑	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☑	AAD: ☑	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-9/2/2021	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☑	SHD: ☐	
	Other: ☐	Other: ☑	w/i: 5Hrs 35Mins	PWS Affected: ☐	

SSO-00014866
31.025592/-87.497763

Received:	Start:	Duration:	Receiving Water: Boggy Branch
9/1/2021	8/31/2021 7:17 A	11Hrs 28Mins	
Notice:	**Stop:**	**Status:**	**Volume:** Range: 50,000 < gallons <=75,000
eSSO	8/31/2021 6:45 P	Completed	

Cause: Heavy rainfall from remnants of Hurricane Ida.

Corrective Actions: None due to heavy rain from remnants of Hurricane Ida.

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☑	Manhole: ☑	Ground: ☑	SWA: ☐	Press: ☑-8/31/2021	
Extreme: ☑	Lift Station: ☐	Storm Drain: ☐	AAC: ☑	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☑	AAD: ☑	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-8/31/2021	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☑	SHD: ☐	
	Other: ☐	Other: ☑	w/i: 23Hrs 29Mins	PWS Affected: ☐	

SSO-00014855
31.03066/-87.479673

Received:	Start:	Duration:	Receiving Water: Boggy Branch
8/31/2021	8/31/2021 6:15 A	3Hrs 5Mins	
Notice:	**Stop:**	**Status:**	**Volume:** Range: 1,000 < gallons <=10,000
eSSO	8/31/2021 9:20 A	Completed	

Cause: Heavy rainfall from remnants of Hurricane Ida.

Corrective Actions: None due to heavy rain from remnants of Hurricane Ida.

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☑	Manhole: ☑	Ground: ☑	SWA: ☐	Press: ☑-8/31/2021	
Extreme: ☑	Lift Station: ☐	Storm Drain: ☐	AAC: ☑	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☑	AAD: ☑	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-8/31/2021	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☑	SHD: ☐	
	Other: ☐	Other: ☑	w/i: 8Hrs 16Mins	PWS Affected: ☐	

SSO-00014854
31.02299/-87.503353

Received:	Start:	Duration:	Receiving Water: Boggy Branch
8/31/2021	8/31/2021 6:10 A	7Hrs 12Mins	
Notice:	**Stop:**	**Status:**	**Volume:** Range: 25,000 < gallons <=50,000
eSSO	8/31/2021 1:22 P	Completed	

Cause: Heavy rainfall from remnants of Hurricane Ida.

Corrective Actions: None due to heavy rain from remnants of Hurricane Ida.

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☑	Manhole: ☑	Ground: ☑	SWA: ☐	Press: ☑-8/31/2021	
Extreme: ☑	Lift Station: ☐	Storm Drain: ☐	AAC: ☑	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☑	AAD: ☑	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-8/31/2021	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☑	SHD: ☐	
	Other: ☐	Other: ☑	w/i: 8Hrs 11Mins	PWS Affected: ☐	

SSO-00014825
31.02559/-87.497763

Received:	Start:	Duration:	Receiving Water: Boggy Branch
8/31/2021	8/30/2021 9:20 A	9Hrs 5Mins	
Notice:	**Stop:**	**Status:**	**Volume:** Range: 50,000 < gallons <=75,000
eSSO	8/30/2021 6:25 P	Completed	

Cause: Heavy rain bans associated wit Hurricane Ida.

Corrective Actions: Due to heavy rainfall from Hurricane Ida the sewer system was flooded.

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☑	Manhole: ☑	Ground: ☑	SWA: ☐	Press: ☑-8/30/2021	
Extreme: ☑	Lift Station: ☐	Storm Drain: ☐	AAC: ☑	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☑	AAD: ☑	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-8/31/2021	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☑	SHD: ☐	
	Other: ☐	Other: ☑	w/i: 23Hrs 53Mins	PWS Affected: ☐	

SSO-00014822 31.022998-87.503353

Received:	Start:	Duration:	Receiving Water: Boggy Branch	
8/31/2021	8/30/2021 9:10 A	9Hrs 7Mins		
Notice:	**Stop:**	**Status:**	**Volume:** Range: 50,000 < gallons <=75,000	
eSSO	8/30/2021 6:17 P	Completed		

Cause: Heavy rain bans associated with Hurricane Ida.

Corrective Actions: Due to heavy rainfall from Hurricane Ida the duplex pump station was overwhelmed due to system

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☑	Manhole: ☑	Ground: ☑	SWA: ☐	Press: ☑-8/30/2021	
Extreme: ☑	Lift Station: ☐	Storm Drain: ☐	AAC: ☑	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☑	AAD: ☑	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-8/31/2021	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☑	SHD: ☐	
	Other: ☐	Other: ☑	w/i: 23Hrs 54Mins	PWS Affected: ☐	

SSO-00014532 31.037400-87.479700

Received:	Start:	Duration:	Receiving Water: Boggy Branch	
6/23/2021	6/22/2021 6:50 A	16Hrs 10Mins		
Notice:	**Stop:**	**Status:**	**Volume:** Range: 50,000 < gallons <=75,000	
eSSO	6/22/2021 11:00 P	Completed		

Cause: Excessive rainfall causing system to backup.

Corrective Actions: None due to heavy excessive rain causing system to backup.

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☑	Manhole: ☑	Ground: ☐	SWA: ☐	Press: ☑-6/22/2021	
Extreme: ☐	Lift Station: ☐	Storm Drain: ☐	AAC: ☑	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☑	AAD: ☑	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-6/22/2021	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☑	SHD: ☐	
	Other: ☐	Other: ☑	w/i: 23Hrs 20Mins	PWS Affected: ☐	

SSO-00014517 31.022998-87.503353

Received:	Start:	Duration:	Receiving Water: Boggy Branch	
6/22/2021	6/22/2021 6:36 A	7Hrs 54Mins		
Notice:	**Stop:**	**Status:**	**Volume:** Range: 10,000 < gallons <= 25,000	
eSSO	6/22/2021 2:30 P	Completed		

Cause: Excessive rainfall causing system to backup.

Corrective Actions: None due to heavy excessive rain causing system to backup.

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☑	Manhole: ☑	Ground: ☐	SWA: ☐	Press: ☑-6/22/2021	
Extreme: ☐	Lift Station: ☐	Storm Drain: ☐	AAC: ☑	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☑	AAD: ☑	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-6/22/2021	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☑	SHD: ☐	
	Other: ☐	Other: ☑	w/i: 11Hrs 41Mins	PWS Affected: ☐	

SSO-00014524 31.025500-87.497700

Received:	Start:	Duration:	Receiving Water: Boggy Branch
6/22/2021	6/22/2021 7:15 A	11Hrs 17Mins	
Notice:	**Stop:**	**Status:**	**Volume:** Range: 25,000 < gallons <=50,000
eSSO	6/22/2021 6:32 P	Completed	

Cause: Excessive rainfall causing system to backup.

Corrective Actions: None due to heavy excessive rain causing system to backup.

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☑	Manhole: ☑	Ground: ☐	SWA: ☐	Press: ☑-6/22/2021	
Extreme: ☐	Lift Station: ☐	Storm Drain: ☐	AAC: ☑	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☑	AAD: ☑	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-6/22/2021	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☑	SHD: ☐	
	Other: ☐	Other: ☑	w/i: 11Hrs 59Mins	PWS Affected: ☐	

SSO-00013540 31.025592-87.497763

Received:	Start:	Duration:	Receiving Water: Boggy Branch
1/22/2021	1/22/2021 2:15 P	0Hrs 45Mins	
Notice:	**Stop:**	**Status:**	**Volume:** Range: 1,000 < gallons <=10,000
eSSO	1/22/2021 3:00 P	Completed	

Cause: Clogged sewer main.

Corrective Actions: Ran main sewer line to break up clog.

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☑	Manhole: ☑	Ground: ☐	SWA: ☐	Press: ☑-1/22/2021	
Extreme: ☐	Lift Station: ☐	Storm Drain: ☐	AAC: ☑	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☑	AAD: ☑	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-1/22/2021	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☑	SHD: ☐	
	Other: ☐	Other: ☑	w/i: 2Hrs 22Mins	PWS Affected: ☐	

SSO-00009033 31.037400-87.479700

Received:	Start:	Duration:	Receiving Water: Boggy Branch
9/6/2018	9/5/2018 2:30 P	4Hrs 15Mins	
Notice:	**Stop:**	**Status:**	**Volume:** Range: 1,000 < gallons <=10,000
eSSO	9/5/2018 6:45 P	Completed	

Cause: Heavy rains from Tropical Storm Gordon.

Corrective Actions: None due to system backed up from heavy rains from Tropical Storm Gordon.

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☑	Manhole: ☑	Ground: ☐	SWA: ☐	Press: ☑-9/6/2018	
Extreme: ☑	Lift Station: ☐	Storm Drain: ☐	AAC: ☐	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☐	AAD: ☑	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-9/6/2018	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☑	SHD: ☐	
	Other: ☐	Other: ☐	w/i: 23Hrs 47Mins	PWS Affected: ☐	

SSO-00007809
31.025500/-87.497700

Received:	Start:	Duration:	Receiving Water: Boggy Branch
10/24/2017	10/23/2017 9:45 A	5Hrs 30Mins	
Notice:	Stop:	Status:	Volume: Range: <1,000 gallons
	10/23/2017 3:15 P	Completed	

Cause: Heavy rain

Corrective Actions: Manhole cover is a bolt down sealed lid. Looking into a new seal for manhole cover or replacement lid.

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☐	Manhole: ☑	Ground: ☐	SWA: ☐	Press: ☑-10/24/2017	
Extreme: ☐	Lift Station: ☐	Storm Drain: ☐	AAC: ☐	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☐	AAD: ☐	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-10/24/2017	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☐	SHD: ☐	
	Other: ☐	Other: ☐	w/i:	PWS Affected: ☐	

SSO-00007519
31.037400/-87.479700

Received:	Start:	Duration:	Receiving Water: Boggy Branch
9/1/2017	8/31/2017 8:20 A	8Hrs 54Mins	
Notice:	Stop:	Status:	Volume: Range: >=1,000 gallons
	8/31/2017 5:14 P	Completed	

Cause: System backed up due to heavy rains associated with remnants of Hurricane Harvey

Corrective Actions: System was backed up due to heavy rain fall associated with remnants of Hurricane Harvey.

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☐	Manhole: ☑	Ground: ☐	SWA: ☐	Press: ☑-8/31/2017	
Extreme: ☐	Lift Station: ☐	Storm Drain: ☐	AAC: ☐	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☐	AAD: ☐	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-8/31/2017	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☐	SHD: ☐	
	Other: ☐	Other: ☐	w/i:	PWS Affected: ☐	

SSO-00007035
31.018000/-87.514400

Received:	Start:	Duration:	Receiving Water: Boggy Branch
6/22/2017	6/21/2017 7:20 P	10Hrs 35Mins	
Notice:	Stop:	Status:	Volume: Range: >=1,000 gallons
	6/22/2017 5:55 A	Completed	

Cause: wastewater system backed up due to excessive rainfall associated with Tropical Storm Cindy

Corrective Actions: sewer system over loaded due to excessive rainfall from Tropical Storm Cindy

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☐	Manhole: ☑	Ground: ☐	SWA: ☐	Press: ☑-6/22/2017	
Extreme: ☐	Lift Station: ☐	Storm Drain: ☐	AAC: ☐	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☐	AAD: ☐	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-6/22/2017	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☐	SHD: ☐	
	Other: ☐	Other: ☐	w/i:	PWS Affected: ☐	

SSO-00007008
31.037400/-87.479700

Received:	Start:	Duration:	Receiving Water: Boggy Branch	
6/26/2017	6/21/2017 9:27 A	53Hrs 23Mins		
Notice:	Stop:	Status:	Volume: Range: >=10,000 gallons	
	6/23/2017 2:50 P	Completed		

Cause: Heavy rain associated with Tropical Storm Cindy

Corrective Actions: Sewer system over loaded due to Tropical Storm Cindy

Comments: SSO had stopped on 6/23/2017 at 2:50pm. Due to E-SSO server's being down was unable **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☐	Manhole: ☑	Ground: ☐	SWA: ☐	Press: ☑-6/22/2017	
Extreme: ☐	Lift Station: ☐	Storm Drain: ☐	AAC: ☐	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☐	AAD: ☐	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-6/22/2017	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☐	SHD: ☐	
	Other: ☐	Other: ☐	w/i:	PWS Affected: ☐	

SSO-00007011
31.025500/-87.497700

Received:	Start:	Duration:	Receiving Water: Boggy Branch	
6/26/2017	6/21/2017 12:10 P	41Hrs 31Mins		
Notice:	Stop:	Status:	Volume: Range: >=1,000 gallons	
	6/23/2017 5:41 A	Completed		

Cause: Heavy rain associated with Tropical Storm Cindy

Corrective Actions: Sewer system over loaded due to excessive rainfall from Tropical Storm Cindy. Manhole is a pressure seal

Comments: SSO had stopped on 6/23/2017 at 5:41am. Due to E-SSO server's being down was unable **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☐	Manhole: ☑	Ground: ☐	SWA: ☐	Press: ☑-6/22/2017	
Extreme: ☐	Lift Station: ☐	Storm Drain: ☐	AAC: ☐	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☐	AAD: ☐	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-6/22/2017	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☐	SHD: ☐	
	Other: ☐	Other: ☐	w/i:	PWS Affected: ☐	

SSO-00006780
31.025500/-87.497700

Received:	Start:	Duration:	Receiving Water: Boggy Branch	
5/24/2017	5/23/2017 9:45 A	6Hrs 2Mins		
Notice:	Stop:	Status:	Volume: Range: <1,000 gallons	
	5/23/2017 3:47 P	Completed		

Cause: Heavy Rain

Corrective Actions: Manhole is a bolt down pressure lid. Bolts worked loose allowing seepage around the ring. Pulled

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☐	Manhole: ☑	Ground: ☐	SWA: ☐	Press: ☑-5/24/2017	
Extreme: ☐	Lift Station: ☐	Storm Drain: ☐	AAC: ☐	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☐	AAD: ☐	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-5/24/2017	Other: ☐
	Treat. Plant: ☐	Creek/River: ☑	24 Hr Notice: ☐	SHD: ☐	
	Other: ☐	Other: ☐	w/i:	PWS Affected: ☐	

SSO-00006674
No Lat/No Long

Received:	Start:	Duration:	Receiving Water:	
5/4/2017	5/4/2017 9:30 A	1Hrs 25Mins		
Notice:	**Stop:**	**Status:**	**Volume:** Range: <1,000 gallons	
	5/4/2017 10:55 A	Completed		

Cause: Excessive rain

Corrective Actions: Re-tighten manhole compression lid

Comments: **Attachments:** ☐

Weather:	Source:	Destination:	Response:	Notice Details:	
Wet: ☐	Manhole: ☑	Ground: ☐	SWA: ☐	Press: ☑-5/4/2017	
Extreme: ☐	Lift Station: ☐	Storm Drain: ☐	AAC: ☐	Signs: ☐	
	Broken Line: ☐	Drain. Ditch: ☑	AAD: ☐	Other: ☐ ()	
	Cleanout: ☐	Backup: ☐	OPI: ☐	CHD: ☑-5/4/2017	Other: ☐
	Treat. Plant: ☐	Creek/River: ☐	24 Hr Notice: ☐	SHD: ☐	
	Other: ☐	Other: ☑	w/i:	PWS Affected: ☐	