Final

Total Maximum Daily Load (TMDL)
For
West Fork Choctawhatchee River

Assessment Unit ID Numbers:
AL03140201-0406-100
AL03140201-0407-101
AL03140201-0407-102

Pathogens (*E. coli*)

Alabama Department of Environmental Management
Water Quality Branch
Water Division
July 2021

Figure 1: The West Fork Choctawhatchee River watershed

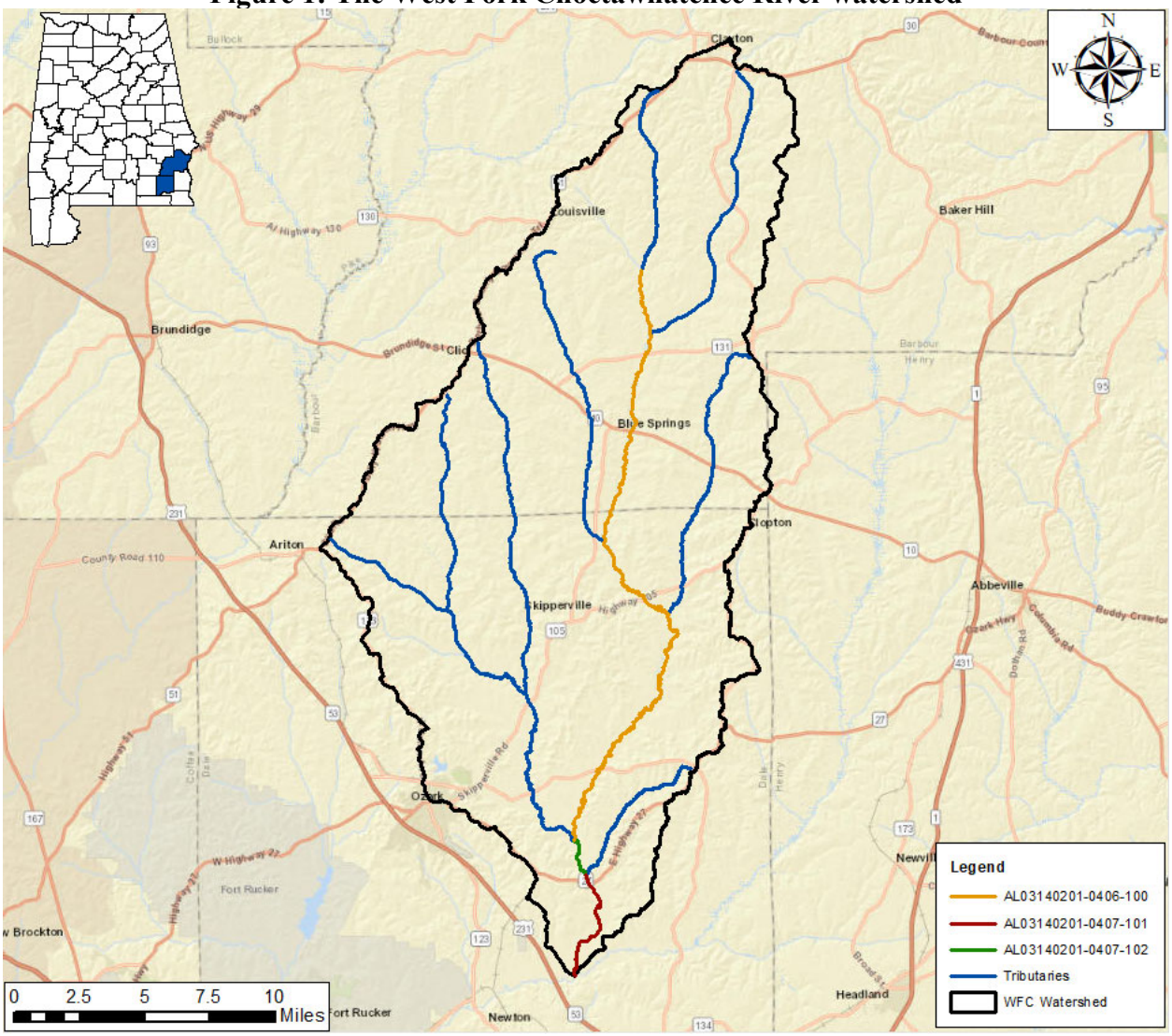


Table of Contents

List of Figures

List of 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 waste load allocations (WLAs) for point sources, load allocations (LAs) for nonpoint sources including natural background levels, and a margin of safety (MOS).

The West Fork Choctawhatchee River is currently included on Alabama's §303(d) list as impaired for pathogens from the Choctawhatchee River to its source. The West Fork Choctawhatchee River headwaters forms in Barbour County, and it flows for approximately 39.4 miles before it merges with the East Fork Choctawhatchee River (Dale County) to form the Choctawhatchee River. The West Fork Choctawhatchee River is a significant tributary to the Choctawhatchee River, contributing approximately 354.8 square miles of drainage area. The top and bottom impaired segments (AL03140201-0406-100, AL03140201-0407-101) of the West Fork Choctawhatchee River are classified as Swimming and Other Whole Body Water-Contact Sports/Fish & Wildlife; the middle impaired segment (AL03140201-0407-102) is classified as Fish & Wildlife.

The West Fork Choctawhatchee River was originally listed on the §303(d) list for pathogens (*E. coli*) in 2016. The West Fork Choctawhatchee River was sampled in 2014 and was found to exceed bacteriological standards at multiple stations. Due to these exceedances, follow up sampling was done in 2020 to verify impairment. The pathogen indicator for non-coastal waters was changed in December 2009 from fecal coliform to Escherichia coli (*E. coli*).

In 2020, §303(d) sampling studies were performed by ADEM on the West Fork Choctawhatchee River to further assess the water quality of the impaired stream. For purposes of this TMDL, the 2020 data will be used to assess the water quality of the West Fork Choctawhatchee River because it is the most current data and provides the best picture of the current water quality conditions of the stream. The 2020 edition of *Alabama's Water Quality Assessment and Listing Methodology* section 4.8.2, prepared by ADEM, provides the rationale for the Department to use the most recent data to prepare a TMDL for an impaired waterbody. All of the available and recent bacteriological data is listed in the Appendix for reference. ADEM collected 45 samples from the West Fork Choctawhatchee River in 2020. According to the data, the West Fork Choctawhatchee River was not meeting the pathogen criteria applicable to its use classification of Swimming and Other Whole Body Water-Contact Sports (S)/Fish & Wildlife (F&W). Therefore, this TMDL has been developed for pathogens (*E. coli*) for all three impaired segments of the West Fork Choctawhatchee River.

A mass balance approach was used for calculating the pathogen TMDL for the West Fork Choctawhatchee River. The mass balance approach utilizes the conservation of mass principle. The TMDL was calculated using the single sample or geometric mean sample exceedance event that 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 211.5 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). Tables 1 and 2 list the TMDL for each segment, defined as the maximum allowable *E. coli* loading under critical conditions for the West Fork Choctawhatchee River.

Table 1: *E. coli* TMDL for West Fork Choctawhatchee River (AL03140201-0406-100)

TMDL[a]	Margin of Safety (MOS)	Waste Load Allocation (WLA)[b]			Load Allocation (LA)	
		WWTPs[c]	MS4s[d]	Leaking Collection Systems[e]		
(col/day)	(col/day)	(col/day)	% reduction	(col/day)	(col/day)	% reduction
4.41E+11	4.41E+10	NA	NA	0	3.97E+11	89%

Note: NA = not applicable
a. TMDL was established using the single sample criterion of 235 colonies/100ml.
b. Both existing and future CAFOs in the watershed will be assigned a waste load allocation (WLA) of zero.
c. WLA for WWTPs is expressed as a daily maximum. Future WWTPs must meet the applicable instream water quality criteria for pathogens at the point of discharge.
d. Future MS4 areas would be required to demonstrate consistency with the assumptions and requirements of this TMDL.
e. 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*.

Table 2: *E. coli* TMDL for West Fork Choctawhatchee River (AL03140201-0407-101 and AL03140201-0407-102)

TMDL[a]	Margin of Safety (MOS)	Waste Load Allocation (WLA)[b]			Load Allocation (LA)	
		WWTPs[c]	MS4s[d]	Leaking Collection Systems[e]		
(col/day)	(col/day)	(col/day)	% reduction	(col/day)	(col/day)	% reduction
1.73E+12	1.73E+11	4.45E+9	NA	0	1.55E+12	74%

Note: NA = not applicable
a. TMDL was established using the single sample criterion of 235 colonies/100ml.
b. Both existing and future CAFOs in the watershed will be assigned a waste load allocation (WLA) of zero.
c. WLA for WWTPs is expressed as a daily maximum. Future WWTPs must meet the applicable instream water quality criteria for pathogens at the point of discharge.
d. Future MS4 areas would be required to demonstrate consistency with the assumptions and requirements of this TMDL.
e. 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*.

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 to targeting the load reductions to improve water quality in the West Fork Choctawhatchee River 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 the three segments of the West Fork Choctawhatchee River, totaling 39.4 miles, as impaired for pathogens. The §303(d) listing was originally reported on Alabama's 2016 List of Impaired Waters for pathogens (*E. coli*) based on data collected from 2014, and was included on all subsequent lists. The source of the impairment on the 2020 §303(d) list is animal feeding operations and pasture grazing.

2.2 Problem Definition

Waterbody Impaired:	West Fork Choctawhatchee River - From the Choctawhatchee River to its source
Impaired Reach Length:	39.4 miles
Impaired Drainage Area:	354.8 square miles
Water Quality Standard Violation:	Pathogens (Single Sample Maximum, Geometric Mean)
Pollutant of Concern:	Pathogens (*E. coli*)
Water Use Classifications:	Swimming and Other Whole Body Water-Contact Sports/Fish and Wildlife, Fish and Wildlife

Usage Related to Classification:
Two of the impaired stream segments are classified as Swimming and Other Whole Body Water-Contact Sports (S)/Fish and Wildlife (F&W), and one segment is classified as Fish and Wildlife (F&W). 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.

Usage of waters in the Swimming and Other Whole Body Water-Contact Sports classification is described in ADEM Admin. Code R. 335-6-10-.09(3)(a) and (b).

(a) Best usage of waters: swimming and other whole body water-contact sports.

(b) Conditions related to best 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. The quality of waters will also be suitable for the propagation of fish, wildlife and aquatic life. The quality of salt waters and estuarine waters to which this classification is assigned will be suitable for the propagation and harvesting of shrimp and crabs.

<u>*E. coli* Criteria:</u>
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:

7. 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 for acceptable bacteria levels for the Swimming and Other Whole Body Water-Contact Sports use classification are described in ADEM Admin. Code R. 335-6-10-.09(3)(c)6(i), (ii), and (iii) as follows:

6. Bacteria:

(i) 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.

(ii) In all other areas, 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 235 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 104 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 mean bacterial 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.

(iii) The policy of nondegradation of high quality waters shall be stringently applied to bacterial quality of recreational waters.

Criteria Exceeded:
Data collected in 2014 was used for listing the West Fork Choctawhatchee River on Alabama's 2016 §303(d) list for pathogens (*E. coli*). The West Fork Choctawhatchee River was listed based on single sample criterion violations from stations WCHB-1A, WFCD-4, WFCD-10, and WFCD-12. These stations are located on the segments classified as Swimming and Other Whole Body Water-Contact Sports; therefore, the criteria for this use classification were applied to evaluate the waterbody. The 2014 data can be found in Appendix 7.2

3.0 Technical Basis for TMDL Development

3.1 Water Quality Target Identification

On December 11, 2009, the Alabama Environmental Management Commission adopted the *E. coli* criteria as the bacterial indicator to assess the levels of bacteria in freshwater. Prior to the adoption of the *E. coli* criteria, the fecal coliform criteria were used by ADEM as the bacterial indicator for freshwater. The *E. coli* criteria was recommended by the EPA as a better correlation

to swimming and incidental water contact associated health effects than fecal coliform in the 1986 publication *Quality Criteria for Water* (EPA 440/5-86-001). As a result of this bacterial indicator change, this TMDL will be developed from *E. coli* data collected on the West Fork Choctawhatchee River.

For the purpose of this TMDL, a single sample maximum *E. coli* target of 211.5 colonies/100ml will be used. This target was derived by using a 10% explicit margin of safety from the single sample maximum criterion of 235 colonies/100 ml. This target is considered protective of water quality standards and should not allow the single sample maximum of 235 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 West Fork Choctawhatchee River 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

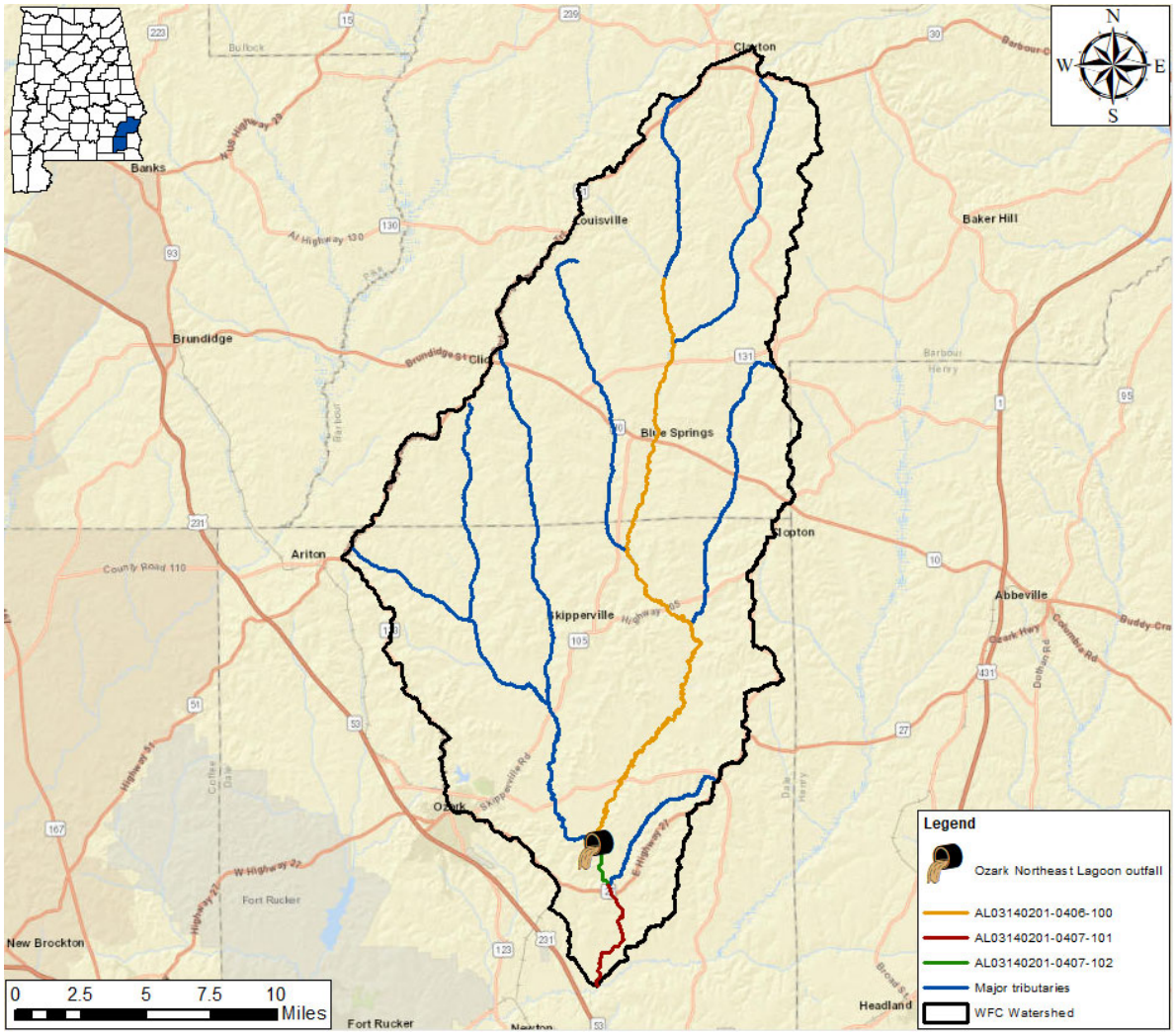
Ozark Northeast Lagoon is currently the only continuous NPDES-permitted facility in the West Fork Choctawhatchee River watershed. The Ozark Northeast Lagoon is a municipal facility that serves the city of Ozark, Alabama. This facility discharges directly to the West Fork Choctawhatchee River. The facility outfall is located at the bottom of impaired segment AL03140201-0406-100, which is classified as S/F&W. Currently, the permit for Ozark Northeast Lagoon has a design flow of 0.5 million gallons per day (MGD) and year-round daily maximum and monthly average *E. coli* limits. The permit limits are the applicable pathogen criteria for the Swimming and Other Whole Body-Contact Sports use classification and are as follows:

Monthly average: 126 colonies/100ml
Daily maximum: 235 colonies/100ml

Table 3: Permitted NPDES continuous dischargers in the West Fork Choctawhatchee River watershed

Type	Permit Number	Facility Name	Receiving Stream	Flow (MGD)
Municipal	AL0058688	Ozark Northeast Lagoon	West Fork Choctawhatchee River	0.5

Figure 2: Ozark Northeast Lagoon in the West Fork Choctawhatchee River watershed



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

There are currently four NPDES storm water discharge permits within the West Fork Choctawhatchee River watershed. These facilities are not considered to be a source of pathogens

due to the lack of process discharges and the nature of their processes. No *E. coli* loading to the West Fork Choctawhatchee River will be attributed to these facilities, and they will not receive an allocation in this TMDL.

Table 4: Permitted NPDES non-continuous dischargers in the West Fork Choctawhatchee River watershed

Permit Number	Name	Type
AL0071218	Slawson Manufacturing Inc.	Storm water
AL0066206	Sunbelt Forest Products Inc.	Storm water
ALG120757	Brown Manufacturing Corp.	Storm water
ALG140323	Boyd Brothers Transportation	Storm water

Currently, there are no Municipal Separate Stormwater Sewer System (MS4) areas located within the West Fork Choctawhatchee River watershed.

Future NPDES-regulated storm water discharges will be required to demonstrate consistency with the assumptions and requirements of this TMDL.

The West Fork Choctawhatchee River watershed currently contains 66 Voluntary Animal Feeding Operations (AFOs)/Concentrated Animal Feeding Operations (CAFOs). Three produce pullets, five produce breeders, and the remainder produce broilers. AFOs/CAFOs are required to implement and maintain effective best management practices (BMPs) that meet or exceed Natural Resources Conservation Service (NRCS) technical standards and guidelines, and the ADEM AFO/CAFO rules currently prohibit discharges of pollutants from these facilities and their associated land application activities. As a result, current and future AFOs/CAFOs will receive a waste load allocation of zero.

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 the Ozark Northeast Lagoon has reported two SSOs, in March 2016 and July 2018. Due to the volumes (≤1000 gallons), locations, and times they occurred, these SSOs are not considered to be a source of the pathogens issues within the West Fork Choctawhatchee River watershed. The reported SSOs are listed in Appendix 7.4.

3.2.2 Nonpoint Sources in the West Fork Choctawhatchee River 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.

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. To account for the potential influence from animals with direct access to stream reaches in the watershed, *E. coli* loads can be calculated as a direct source into the stream.

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.

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

3.3 Land Use Assessment

Land use for the West Fork Choctawhatchee River watershed was determined using ArcMap with land use datasets derived from the 2016 National Land Cover Dataset (NLCD). Table 5 depicts the primary land uses in the West Fork Choctawhatchee River watershed. Figure 3 displays the land use areas within the watershed.

The majority of the West Fork Choctawhatchee River watershed is comprised of forested/natural areas that make up 77.94% of the watershed area. Agricultural lands uses, which can contribute to pathogen run-off into streams if not managed properly, make up 17.24% of the watershed area. The remaining 4.81% of the land area consists of open water and developed land. Developed land includes both commercial and residential land uses.

Table 5: Land use (2016) in the West Fork Choctawhatchee River watershed

Land Use	Miles^2	Acres	Percent
Open Water	2.32	1484.93	0.65%
Developed, Open Space	12.05	7713.54	3.40%
Developed, Low Intensity	2.13	1364.17	0.6%
Developed, Medium Intensity	0.4	255.31	0.11%
Developed, High Intensity	0.11	70.50	0.03%
Barren Land	0.07	42.26	0.02%
Deciduous Forest	13.92	8911.58	3.92%
Evergreen Forest	103.47	66218.28	29.16%
Mixed Forest	73.95	47324.95	20.84%
Shrub/Scrub	36.59	23416.62	10.31%
Herbaceous	12.72	8142.1	3.59%
Hay/Pasture	41.9	26816.37	11.81%
Cultivated Crops	19.28	12338.24	5.43%
Woody Wetlands	35.38	22640.01	9.97%
Emergent Herbaceous Wetlands	0.5	322.25	0.14%
Totals→	**354.78**	**227061.1**	100.00%
Class Description	**Miles^2**	**Acres**	**Percent**
Open Water	2.32	1484.93	0.65%
Agricultural Lands	61.18	39154.61	17.24%
Forested/Natural	276.52	176975.797	77.94%
Developed Land (Grouped)	14.76	9445.78	4.16%
Totals→	**354.78**	**227061.1**	100%

Figure 3: Land use in the West Fork Choctawhatchee River watershed

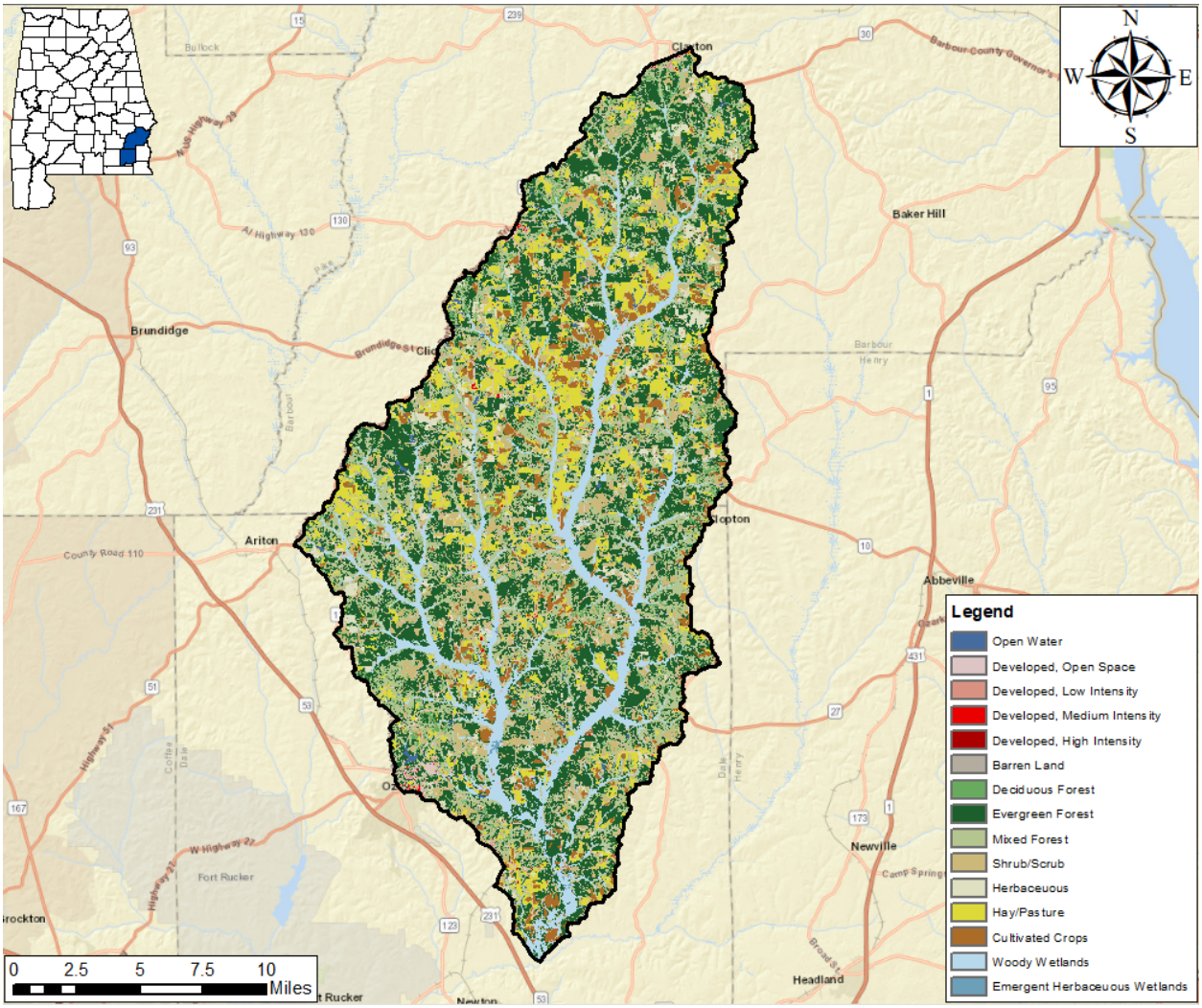
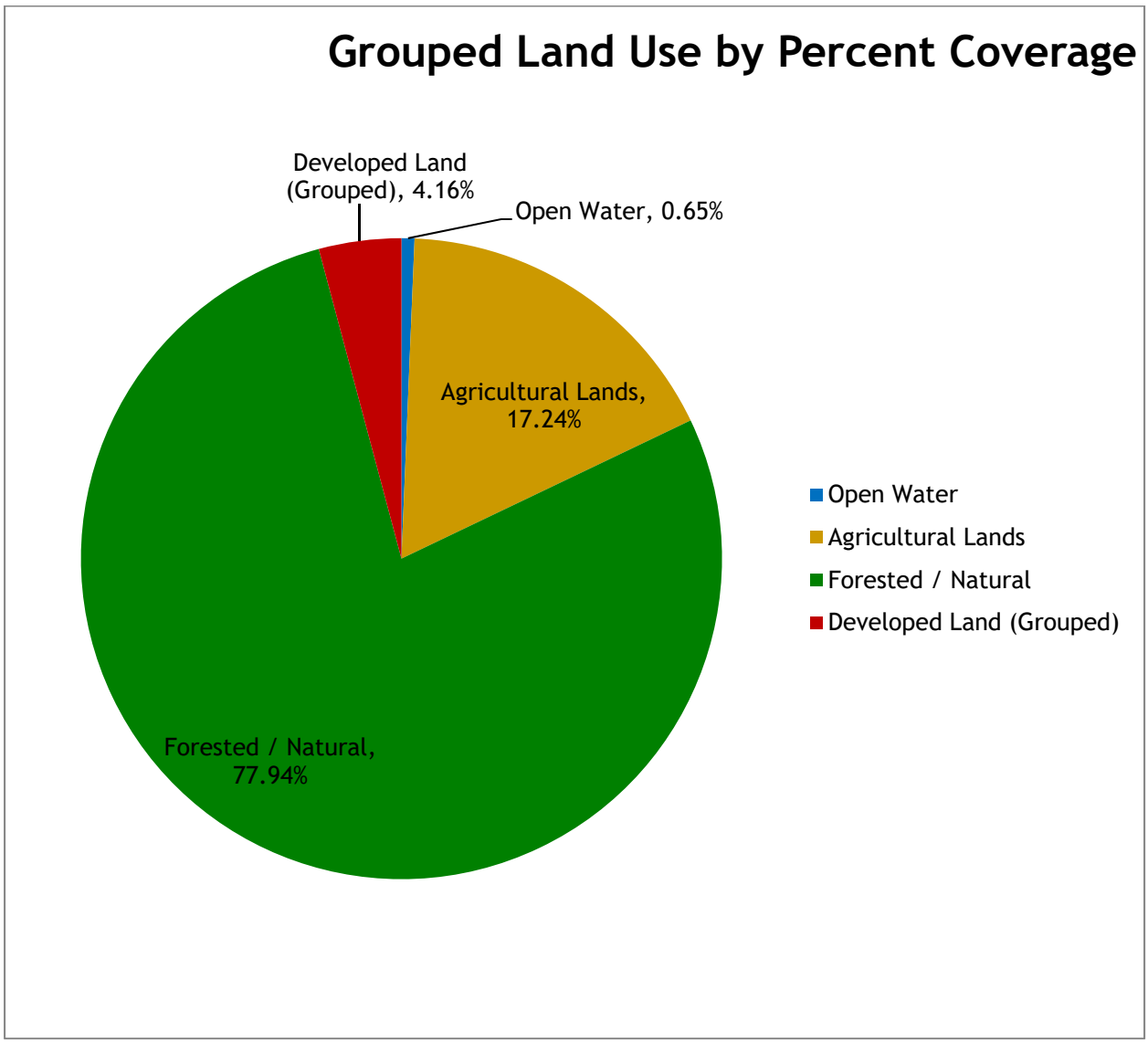


Figure 4: Pie graph of land use in the West Fork Choctawhatchee River watershed



3.4 Linkage between Numeric Targets and Sources

The major land usage in the West Fork Choctawhatchee River watershed is forest, with agriculture and developed land a distant second and third, respectively. 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 within the watershed are from the agricultural land uses. 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.

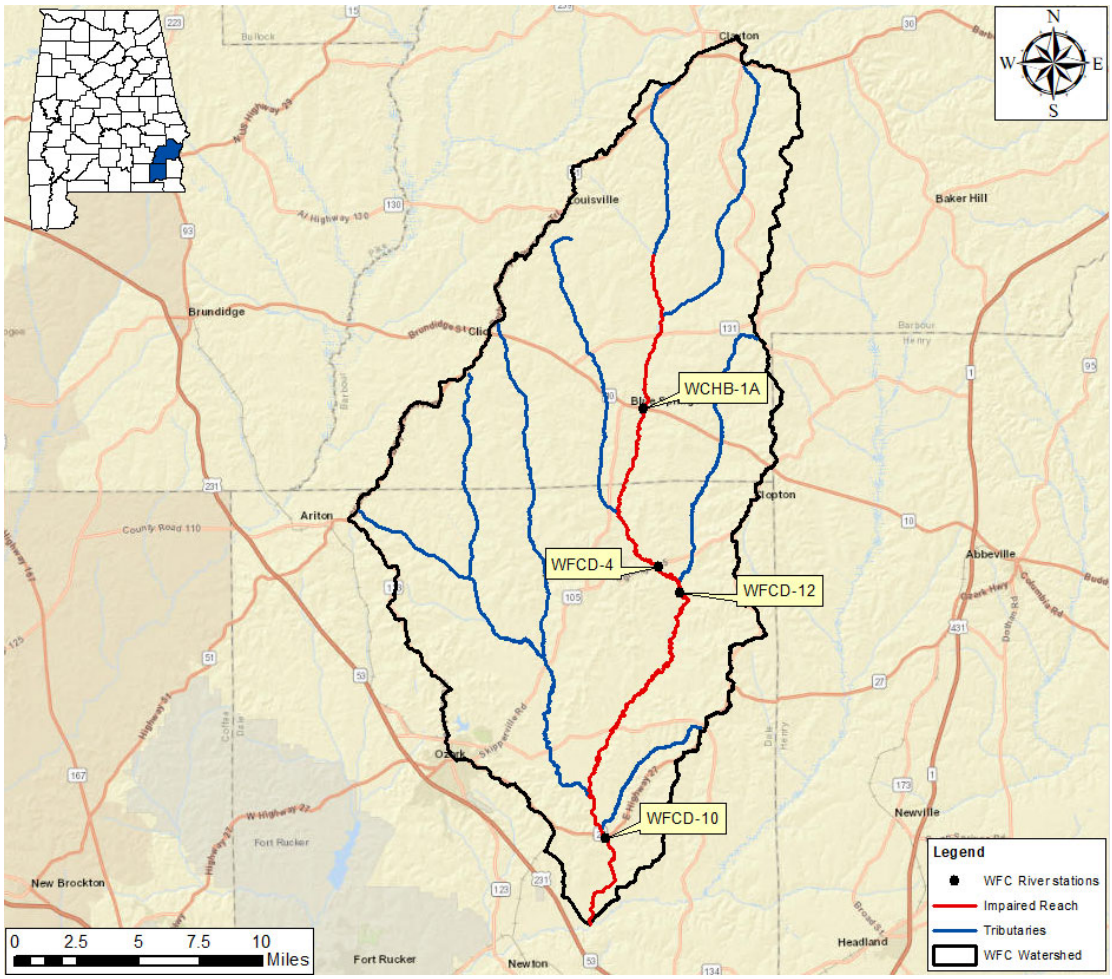
3.5 Data Availability and Analysis

ADEM collected *E. coli* data on the West Fork Choctawhatchee River at three stations (WCHB-1A, WFCD-4, WFCD-10) from May 2020 to December 2020. A total of 45 *E. coli* samples were collected, and all three stations exhibited single sample and geometric mean *E. coli* exceedances. Table 6 and Figure 5 show the locations of these ADEM stations on the West Fork Choctawhatchee River. (Station WFCD-12 is also shown; this station was last sampled in 2014.)

Table 6: ADEM sampling stations on the West Fork Choctawhatchee River

Station	Local Name	Latitude	Longitude
WCHB-1A	WFC River	31.663692°	-85.504492°
WFCD-4	WFC River	31.57037°	-85.495626°
WFCD-10	WFC River	31.411347°	-85.534844°
WFCD-12	WFC River	31.554845°	-85.481596°

Figure 5: ADEM sampling stations on the West Fork Choctawhatchee River



WCHB-1A: Single sample violations occurred at WCHB-1A on May 19, September 1, September 10, September 14, November 5, and December 1, 2020, with the highest *E. coli* concentration at 1986.3 colonies/100 ml. In addition, sampling May 19 through June 16 and September 1 through September 23 yielded geometric mean violations of 225.44 colonies/100 ml and 227.49 colonies/100 ml, respectively.

Table 7: *E. coli* data at WCHB-1A (AL03140201-0406-100)

WCHB-1A			
Visit Date	**Single Sample (col/100 mL)**	**Geometric Mean (col/100 mL)**	**Flow (cfs)**
5/19/2020	**1986.3**	**225.4414073**	76.76*
6/8/2020	214.2		82.2
6/9/2020	111.9		76.89*
6/11/2020	209.8		92.82*
6/16/2020	58.3		25.3
7/9/2020	131.7	-	28
8/4/2020	99	-	13.3
9/1/2020	**248.9**	**227.4893758**	51.9
9/9/2020	73.3		16.5
9/10/2020	**435.2**		21.4
9/14/2020	**365.4**		37.68*
9/23/2020	210		137.84*
10/21/2020	137.6	-	36.9
11/5/2020	**235.9**	-	51.5
12/1/2020	**435.2**	-	105.85*

*Flows on these dates were estimated using USGS gauge 02361000 and drainage area ratios.

WFCD-4: Single sample violations occurred at WFCD-4 on May 19, June 8, September 1, September 14, October 21, and December 1, 2020, with the highest *E. coli* concentration at 1732.9 colonies/100 ml. In addition, sampling May 19 through June 16 and September 1 through September 23 yielded geometric mean violations of 251.94 colonies/100 ml and 239.15 colonies/100 ml, respectively.

Table 8: *E. coli* data at WFCD-4 (AL03140201-0406-100)

WFCD-4			
Visit Date	**Single Sample (col/100 mL)**	**Geometric Mean (col/100 mL)**	**Flow (cfs)**
5/19/2020	**1732.9**	**251.9395128**	123.59*
6/8/2020	**344.8**		126.2
6/9/2020	117.8		96.9
6/11/2020	172.5		149.44*
6/16/2020	83.6		47.8
7/9/2020	96	-	67.1
8/4/2020	104.3	-	26.2
9/1/2020	**410.6**	**239.1533141**	126.5
9/9/2020	156.5		23.8
9/10/2020	201.4		26.3
9/14/2020	**290.9**		60.67*
9/23/2020	207.8		221.92*
10/21/2020	**238.2**	-	66.5
11/5/2020	101.7	-	89.3
12/1/2020	**387.3**	-	293.9

*Flows on these dates were estimated using USGS gauge 02361000 and drainage area ratios.

WFCD-10: Single sample violations occurred at WFCD-10 on May 19, June 11, September 14, and December 1, 2020, with the highest *E. coli* concentration at 816.4 colonies/100 ml. In addition, sampling May 19 through June 16 and September 1 through September 23 yielded geometric mean violations of 136.33 colonies/100 ml and 142.94 colonies/100 ml, respectively.

Table 9: *E. coli* data at WFCD-10 (AL03140201-0407-101)

WFCD-10			
Visit Date	**Single Sample (col/100 mL)**	**Geometric Mean (col/100 mL)**	**Flow (cfs)**
5/19/2020	**816.4**	**136.3298674**	301.38*
6/8/2020	79.4		125.5
6/9/2020	69.1		301.87*
6/11/2020	**325.5**		364.43*
6/16/2020	32.3		101.6
7/9/2020	88.4	-	159.4
8/4/2020	21.6	-	71.1
9/1/2020	209.8	**142.9396878**	161.5
9/9/2020	65		58
9/10/2020	62.7		42.5
9/14/2020	**344.8**		136.1
9/23/2020	202.4		541.19*
10/21/2020	142.1	-	89.9
11/5/2020	98.8	-	139.8
12/1/2020	**547.5**	-	341.1

*Flows on these dates were estimated using USGS gauge 02361000 and drainage area ratios.

3.6 Critical Conditions/Seasonal Variation

The *E. coli* single sample maximum criterion of 235 colonies/100 ml and geometric mean criterion of 126 colonies/100 ml for the Swimming and Other Whole Body Water-Contact Sports use classification are applicable year-round. The critical condition for this pathogen TMDL was taken to be the one with the highest *E. coli* single sample exceedance value. The use of the highest exceedance to calculate the TMDL is expected to be protective of water quality in the West Fork Choctawhatchee River 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 criterion of 235 colonies/100 ml was reduced by 10% to 211.5 colonies/100ml, 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 waste load allocations (WLAs) for point sources, 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 the West Fork Choctawhatchee River. The mass balance approach utilizes the conservation of mass principle. Total mass loads can be calculated by multiplying the *E. coli* concentration times the estimated in-stream 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 was calculated by multiplying the highest *E. coli* single sample exceedance concentration by the calculated flow on the day of the exceedance. For example, the calculation for the existing condition for segment AL03140201-0406-100 was based on the measurements at WCHB-1A on May 19, 2020. The product of the concentration times the flow times the conversion factor gives the total mass loading (colonies per day) of *E. coli* to West Fork Choctawhatchee River under the single sample exceedance condition.

$$\frac{76.76\ ft^3}{s} \times \frac{1986.3\ colonies}{100\ mL} \times \frac{24{,}465{,}755 * 100\ mL * s}{ft^3 * day} = \frac{3.73 \times 10^{12} colonies}{day}$$

The **geometric mean** mass loading was calculated by multiplying the highest geometric mean exceedance concentration by the average of the five measured or calculated flows. For example, a geometric mean for segment AL03140201-0406-100 was calculated based on measurements at WFCD-4 between May 19, 2020, and June 16, 2020 (as seen in Appendix 7.2). The flows for May 19, 2020, and June 11, 2020 had to be estimated since there were no flow measurements taken during the sample collections. Using USGS gauge 02361000 and drainage area ratios, the flows at WFCD-4 on May 19, 2020, and June 11, 2020 were determined to be 123.59 cfs and 149.44 cfs, respectively. The average stream flow for the five samples utilized in the geometric mean calculation was 108.8 cfs. The product of the concentration times the flow times the conversion factor gives the total mass loading (colonies per day) of *E. coli* to the West Fork Choctawhatchee River under the geometric mean exceedance condition.

$$\frac{108.8\ ft^3}{s} \times \frac{251.94\ colonies}{100\ mL} \times \frac{24{,}465{,}755 * 100\ mL * s}{ft^3 * day} = \frac{6.71 \times 10^{11} colonies}{day}$$

The **continuous point sources** mass loading was calculated by taking the average discharge flow from the month of May 2020 (since this is when the highest exceedance occurred at WFCD-10) and multiplying that by the reported maximum daily *E. coli* value for the same month. These numbers were found in the May 2020 Discharge Monitoring Report (DMR) submitted by the facility. This was then multiplied by the conversion factor to determine the existing load in colonies per day.

Ozark Northeast Lagoon:

$$0.304\ MGD \times \frac{1.55\ ft^3}{s * MGD} \times \frac{1\ colonies}{100\ mL} \times \frac{24{,}465{,}755 * 100\ mL * s}{ft^3 * day} = \frac{1.15 \times 10^7 colonies}{day}$$

Allowable Conditions

The **allowable load** to the watershed 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 estimated flow and the allowable concentration. This value was then multiplied by the conversion factor to calculate the allowable load.

As an example, for the **single sample** *E. coli* target concentration of 211.5 colonies/100 ml, the allowable *E. coli* loading for segment AL03140201-0406-100 (at station WCHB-1A) is:

$$\frac{76.76\ \text{ft}^3}{\text{s}} \times \frac{211.5\ \text{colonies}}{100\ \text{ml}} \times \frac{24{,}465{,}755 * 100\ \text{ml} * \text{s}}{\text{ft}^3 * \text{day}} = \frac{3.97 \times 10^{11}\text{colonies}}{\text{day}}$$

The explicit margin of safety of 23.5 colonies/100 ml equals a daily loading of:

$$\frac{76.76\ ft^3}{s} \times \frac{23.5\ colonies}{100\ mL} \times \frac{24{,}465{,}755 * 100\ mL * s}{ft^3 * day} = \frac{4.41 \times 10^{10} colonies}{day}$$

For the **geometric mean** *E. coli* target concentration of 113.4 colonies/100 ml, the allowable *E. coli* loading for segment AL03140201-0406-100 (at station WFCD-4) is:

$$\frac{108.8\ ft^3}{s} \times \frac{113.4\ colonies}{100\ mL} \times \frac{24{,}465{,}755 * 100 mL * s}{ft^3 * day} = \frac{3.02 \times 10^{11} colonies}{day}$$

The explicit margin of safety of 12.6 colonies/100 ml equals a daily loading of:

$$\frac{108.8\ ft^3}{s} \times \frac{12.6\ colonies}{100\ mL} \times \frac{24{,}465{,}755 * 100\ mL * s}{ft^3 * day} = \frac{3.35 \times 10^{10} colonies}{day}$$

The WLA portion of the TMDL was calculated by multiplying the design flow of the Ozark Northeast Lagoon by the applicable in-stream single sample *E. coli* criterion. This value was then multiplied by a conversion factor to come up with the appropriate loading.

Ozark Northeast Lagoon:

$$0.5\ MGD \times \frac{1.55\ ft^3}{s * MGD} \times \frac{235\ colonies}{100\ mL} \times \frac{24{,}465{,}755 * 100\ mL * s}{ft^3 * day} = \frac{4.45 \times 10^9 colonies}{day}$$

The difference between the existing conditions (violation event) and the allowable conditions converted to a percent reduction represents the total load reduction needed to achieve the *E. coli* water quality criteria. Tables 10, 11, and 12 show the existing and allowable *E. coli* loads and required reductions for each station.

Table 10: *E. coli* loads and required reductions for AL03140201-0406-100 at WCHB-1A*

Source	Existing Load (colonies/day)	Allowable Load (colonies/day)	Required Reduction (colonies/day)	% Reduction
Single Sample Load	3.73E+12	3.97E+11	3.33E+12	89%
Geometric Mean Load	2.95E+11	1.47E+11	1.48E+11	50%

*The highest exceedances of the single sample and geometric mean criteria were used in these calculations.

Table 11: *E. coli* loads and required reductions for AL03140201-0406-100 at WFCD-4*

Source	Existing Load (colonies/day)	Allowable Load (colonies/day)	Required Reduction (colonies/day)	% Reduction
Single Sample Load	5.24E+12	6.4E+11	4.6E+12	88%
Geometric Mean Load	6.71E+11	3.02E+11	3.69E+11	55%

*The highest exceedances of the single sample and geometric mean criteria were used in these calculations.

Table 12: *E. coli* loads and required reductions for AL03140201-0407-102 and AL03140201-0407-102 at WFCD-10*

Source	Existing Load (colonies/day)	Allowable Load (colonies/day)	Required Reduction (colonies/day)	% Reduction
Single Sample Load	6.02E+12	1.56E+12	4.46E+12	74%
Geometric Mean Load	6.57E+11	5.21E+11	1.36E+11	21%
Point Source Load	1.15E+7	4.45E+9	0	0%

*The highest exceedances of the single sample and geometric mean criteria were used in these calculations.

The TMDL, WLA, LA and MOS values necessary to achieve the applicable *E. coli* criteria are provided in Tables 13 and 14 below.

Table 13: *E. coli* TMDL for West Fork Choctawhatchee River (AL03140201-0406-100)

TMDL[a]	Margin of Safety (MOS)	Waste Load Allocation (WLA)[b]			Load Allocation (LA)	
		WWTPs[c]	MS4s[d]	Leaking Collection Systems[e]		
(col/day)	(col/day)	(col/day)	% reduction	(col/day)	(col/day)	% reduction
4.41E+11	4.41E+10	NA	NA	0	3.97E+11	89%

Note: NA = not applicable
a. TMDL was established using the single sample criterion of 235 colonies/100ml.
b. Both existing and future CAFOs in the watershed will be assigned a waste load allocation (WLA) of zero.
c. WLA for WWTPs is expressed as a daily maximum. Future WWTPs must meet the applicable instream water quality criteria for pathogens at the point of discharge.
d. Future MS4 areas would be required to demonstrate consistency with the assumptions and requirements of this TMDL.
e. 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*.

Table 14: *E. coli* TMDL for West Fork Choctawhatchee River (AL03140201-0407-101 and AL03140201-0407-102)

TMDL[a]	Margin of Safety (MOS)	Waste Load Allocation (WLA)[b]			Load Allocation (LA)	
		WWTPs[c]	MS4s[d]	Leaking Collection Systems[e]		
(col/day)	(col/day)	(col/day)	% reduction	(col/day)	(col/day)	% reduction
1.73E+12	1.73E+11	4.45E+9	NA	0	1.55E+12	74%

Note: NA = not applicable
a. TMDL was established using the single sample criterion of 235 colonies/100ml.
b. Both existing and future CAFOs in the watershed will be assigned a waste load allocation (WLA) of zero.
c. WLA for WWTPs is expressed as a daily maximum. Future WWTPs must meet the applicable instream water quality criteria for pathogens at the point of discharge.
d. Future MS4 areas would be required to demonstrate consistency with the assumptions and requirements of this TMDL.
e. 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*.

4.3 TMDL Summary

The West Fork Choctawhatchee River was placed on Alabama's §303(d) list in 2016 based on data collected in 2014. Additional data collected by ADEM in 2020 confirmed the pathogen impairment and provided the basis for TMDL development.

A mass balance approach was used to calculate the *E. coli* TMDL for the West Fork Choctawhatchee River. Based on the TMDL analysis, it was determined that *E. coli* reductions of 89% for segment AL03140201-0406-100 and 74% for segments AL03140201-0407-101 and AL03140201-0407-102 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 West Fork Choctawhatchee River 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 statewide approach to water quality management. Each year, ADEM's water quality resources are divided among multiple priorities statewide 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.

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 daily 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. At the end of the public review period, all written comments received during the public notice period became part of the administrative record. ADEM considered all comments received by the public prior to final completion of this TMDL and subsequent submission to EPA Region 4 for final approval.

7.0 Appendices

7.1 References

ADEM Administrative Code, 2020. Water Division - Water Quality Program, Chapter 335-6-10, Water Quality Criteria.

ADEM Administrative Code, 2020. Water Division - Water Quality Program, Chapter 335-6-11, Use Classifications for Interstate and Intrastate Waters.

Alabama's Monitoring Program. 2014, 2020. ADEM.

Alabama Department of Environmental Management (ADEM), Alabama's Water Quality Assessment and Listing Methodology, 2020.

Alabama's §303(d) List and Fact Sheet. 2016, 2018, 2020. ADEM.

Alabama Department of Environmental Management (ADEM) Laboratory QA Manual, Chapter 10, Appendix A: ADEM Laboratory Qualifier Codes and Descriptions, October 12, 2016.

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 Water Quality Data

Table 15: 2014 *E. coli* data for station WCHB-1A

Visit Date	Single Sample (col/100 ml)	*E. coli* Dc	Geometric Mean	Flow Measured	Flow (cfs)
3/27/2014	98.8	-	-	Yes	77.9
4/17/2014	228.2	-	-	No	-
5/14/2014	104.3	-	-	No	-
6/12/2014	119.6	-	-	No	-
7/17/2014	107.1	-	-	No	-
8/14/2014	410.6	-	-	Yes	29.8
9/18/2014	178.9	-	-	Yes	34.1
10/16/2014	816.4	-	-	No	-

Table 16: 2020 *E. coli* data for station WCHB-1A

Visit Date	Single Sample (col/100 ml)	*E. coli* Dc	Geometric Mean	Flow Measured	Flow (cfs)
5/19/2020	1986.3	-		No	-
6/8/2020	214.2	-		Yes	82.2
6/9/2020	111.9	-	225.4414073	No	-
6/11/2020	209.8	-		No	-
6/16/2020	58.3	-		Yes	25.3
7/9/2020	131.7	-	-	Yes	28
8/4/2020	99	-	-	Yes	13.3
9/1/2020	248.9	-		Yes	51.9
9/9/2020	73.3	-		Yes	16.5
9/10/2020	435.2	-	227.4893758	Yes	21.4
9/14/2020	365.4	-		No	-
9/23/2020	210	-		No	-
10/21/2020	137.6	-	-	Yes	36.9
11/5/2020	235.9	-	-	Yes	51.5
12/1/2020	435.2	-	-	No	-

Table 17: 2014 *E. coli* data for station WFCD-4

Visit Date	Single Sample (col/100 ml)	*E. coli* Dc	Geometric Mean	Flow Measured	Flow (cfs)
3/27/2014	69.7	-	-	No	-
4/17/2014	**238.2**	-	-	No	-
5/14/2014	65	-	-	No	-
6/12/2014	**1034.4**	-	-	No	-
7/17/2014	163.2	-	-	No	-
8/14/2014	129.6	-	-	Yes	39.2
9/18/2014	**248.9**	-	-	Yes	58.4
10/16/2014	**1299.7**	-	-	No	-

Table 18: 2020 *E. coli* data for station WFCD-4

Visit Date	Single Sample (col/100 ml)	*E. coli* Dc	Geometric Mean	Flow Measured	Flow (cfs)
5/19/2020	**1732.9**	-		No-estimated	123.6
6/8/2020	**344.8**	-		Yes	126.2
6/9/2020	117.8	-	**251.9395128**	Yes	96.9
6/11/2020	172.5	-		No-estimated	149.5
6/16/2020	83.6	-		Yes	47.8
7/9/2020	96	-	-	Yes	67.1
8/4/2020	104.3	-	-	Yes	26.2
9/1/2020	**410.6**	-		Yes	126.5
9/9/2020	156.5	-		Ys	23.8
9/10/2020	201.4	-	**239.1533141**	Yes	26.3
9/14/2020	**290.9**	-		No	-
9/23/2020	207.8	-		No	-
10/21/2020	**238.2**	-	-	Yes	66.5
11/5/2020	101.7	-	-	Yes	89.3
12/1/2020	**387.3**	-	-	Yes	293.9

Table 19: 2014 *E. coli* data for station WFCD-10

Visit Date	Single Sample (col/100 ml)	*E. coli* Dc	Geometric Mean	Flow Measured	Flow (cfs)
3/24/2014	130.9	H	-	Yes	364.4
4/16/2014	**488.4**	H	-	No	-
5/7/2014	90.8	H	-	No	-
6/11/2014	73.3	H	-	Yes	227.7
7/9/2014	32.7	H	-	No	-
8/18/2014	**261.3**	H	-	Yes	52.9
9/22/2014	142.1	H	-	Yes	82.1
10/20/2014	**235.9**	H	-	Yes	125.1

*H denotes that the holding times for analysis were exceeded.

Table 20: 2020 *E. coli* data for station WFCD-10

Visit Date	Single Sample (col/100 ml)	*E. coli* Dc	Geometric Mean	Flow Measured	Flow (cfs)
5/19/2020	**816.4**	-		No	-
6/8/2020	79.4	-		Yes	125.5
6/9/2020	69.1	-	**136.3298674**	No	-
6/11/2020	**325.5**	-		No	-
6/16/2020	32.3	-		Yes	101.6
7/9/2020	88.4	-	-	Yes	159.4
8/4/2020	21.6	-	-	Yes	71.1
9/1/2020	209.8	-		Yes	161.5
9/9/2020	65	-		Yes	58
9/10/2020	62.7	-	**142.9396878**	Yes	42.5
9/14/2020	**344.8**	-		Yes	136.1
9/23/2020	202.4	-		No	-
10/21/2020	142.1	-	-	Yes	89.9
11/5/2020	98.8	-	-	Yes	139.8
12/1/2020	**547.5**	-	-	Yes	341.1

Table 21: 2014 *E. coli* data for station WFCD-12

Visit Date	Single Sample (col/100 ml)	*E. coli* Dc	Geometric Mean	Flow Measured	Flow (cfs)
3/27/2014	98.7	-	-	No	-
4/17/2014	**238.2**	-	-	No	-
5/14/2014	75.4	-	-	No	-
6/12/2014	**2827.2**	-	-	No	-
7/17/2014	182.2	-	-	No	-
8/14/2014	60.9	-	-	No	-
9/18/2014	133.3	-	-	No	-
10/16/2014	**1203.3**	-	-	No	-

7.3 Continuous Point Source Effluent Data

Table 22: Ozark Northeast Lagoon *E. coli* data*

Monitoring Period End Date	Monthly Average Concentration (col/100 ml)	Maximum Daily Concentration (col/100 ml)
6/30/2014	1	1
7/31/2014	1	1
8/31/2014	1	1
9/30/2014	1	1
1/31/2014	1.1	1.1
2/28/2014	1	1
3/31/2014	5.5	5.5
4/30/2014	1	1
5/31/2014	1	1
10/31/2014	1	1
11/30/2014	1	1
12/31/2014	1	1
1/31/2015	1	1
2/28/2015	1	1
7/31/2016	39.2	39.2
12/31/2016	4.3	4.3
1/31/2017	18.2	18.2
6/30/2017	2.1	2.1
2/28/2018	4.3	4.3
6/30/2018	2.1	2.1
10/31/2018	1	1
11/30/2018	1	1
12/31/2018	1	1
1/31/2019	1	1
2/28/2019	1	1
3/31/2019	1	1
4/30/2019	1	1
5/31/2019	1	1
6/30/2019	1	1
7/31/2019	1	1
8/31/2019	1	1
9/30/2019	1	1
10/31/2019	63	63
12/31/2019	13	13
1/31/2020	3	3
2/29/2020	1	1
3/31/2020	20	20
4/30/2020	1	1
5/31/2020	1	1

Monitoring Period End Date	Monthly Average Concentration (col/100 ml)	Maximum Daily Concentration (col/100 ml)
6/30/2020	1	1
7/31/2020	3	3
8/31/2020	1	1
9/30/2020	1	1
10/31/2020	1	1
11/30/2020	1	1
12/31/2020	1	1

*No *E. coli* exceedances for this facility.

7.4 Sanitary Sewer Overflow (SSO) Data

Table 23: SSOs in the West Fork Choctawhatchee River watershed from the Ozark Northeast Lagoon (Permit No. AL0058688)

Date	Estimated Release Volume (gallons)	Duration (hours)
3/10/2016	<1,000	1
7/16/2018	<=1,000	1

7.5 West Fork Choctawhatchee River Watershed Photos

At station WCHB-1A, looking upstream

At station WCHB-1A, looking downstream

At station WFCD-4, looking upstream

At station WFCD-4, looking downstream

At station WFCD-10, looking upstream

At station WFCD-10, looking downstream

At station WFCD-12, looking upstream

At station WFCD-12, looking downstream