# Total Maximum Daily Load

# Evaluation

# for

# Seventy- Four Stream Segments

# in the

# Ocmulgee River Basin

# for

# Fecal Coliform

Submitted to:
The U.S. Environmental Protection Agency
Region 4
Atlanta, Georgia

Submitted by:
The Georgia Department of Natural Resources
Environmental Protection Division
Atlanta, Georgia

January 2007

# Table of Contents

## List of Tables



## List of Figures



## List of Appendixes

## EXECUTIVE SUMMARY

The State of Georgia assesses its water bodies for compliance with water quality standards criteria established for their designated uses as required by the Federal Clean Water Act (CWA). Assessed water bodies are placed into one of three categories with respect to designated uses: 1) supporting, 2) partially supporting, or 3) not supporting. These water bodies are found on Georgia's 305(b) list as required by that section of the CWA that defines the assessment process, and are published in *Water Quality in Georgia* (GA EPD, 2000 – 2001). This document is available on the Georgia Environmental Protection Division (GA EPD) website.

Some of the 305(b) partially and not supporting water bodies are also assigned to Georgia's 303(d) list, also named after that section of the CWA. Water bodies on the 303(d) list are required to have a Total Maximum Daily Load (TMDL) evaluation for the water quality constituent(s) in violation of the water quality standard. The TMDLs in this document are based on the draft 2006 303(d) listing, which is available on the GA EPD website. This document also includes revised TMDLs for the segments that were included in the 2002 Ocmulgee River Basin Fecal Coliform TMDL. The TMDL process establishes the allowable pollutant loadings or other quantifiable parameters for a water body based on the relationship between pollutant sources and instream water quality conditions. This allows water quality-based controls to be developed to reduce pollution and restore and maintain water quality.

The State of Georgia has identified seventy- four (74) stream segments located in the Ocmulgee River Basin as water quality limited due to fecal coliform. A stream is placed on the partial support list if more than 10% of the samples exceed the fecal coliform criteria and on the not support list if more than 25% of the samples exceed the standard. Water quality samples collected within a 30-day period that have a geometric mean in excess of 200 counts per 100 milliliters during the period May through October, or in excess of 1,000 counts per 100 milliliters during the period November through April, are in violation of the bacteria water quality standard. There is also a single sample maximum criteria (4,000 counts per 100 milliliters) for the months of November through April. The water use classification of all of the impacted streams is Fishing.

An important part of the TMDL analysis is the identification of potential source categories. Sources are broadly classified as either point or nonpoint sources. A point source is defined as a discernable, confined, and discrete conveyance from which pollutants are or may be discharged to surface waters. Nonpoint sources are diffuse, and generally, but not always, involve accumulation of fecal coliform bacteria on land surfaces that wash off as a result of storm events.

The process of developing fecal coliform TMDLs for the Ocmulgee River Basin listed segments includes the determination of the following:

- The current critical fecal coliform load to the stream under existing conditions;
- The TMDL for similar conditions under which the current critical load was determined; and
- The percent reduction in the current critical fecal coliform load necessary to achieve the TMDL.

The calculation of the fecal coliform load at any point in a stream requires the fecal coliform concentration and stream flow. The availability of water quality and flow data varies considerably among the listed segments. The Loading Curve Approach was used to determine

the current fecal coliform load and TMDL. The fecal coliform loads and required reductions for each of the listed segments are summarized in the table below.

Management practices that may be used to help reduce fecal coliform source loads include:

- Compliance with NPDES permit limits and requirements;
- Adoption of NRCS Conservation Practices; and
- Application of Best Management Practices (BMPs) appropriate to reduce nonpoint sources.

The amount of fecal coliform delivered to a stream is difficult to determine. However, by requiring and monitoring the implementation of these management practices, their effects will improve stream water quality, and represent a beneficial measure of TMDL implementation.

## Fecal Coliform Loads and Required Fecal Coliform Load Reductions

| Stream Segment | Current Load (counts/ 30 days) | TMDL Components | | | | | Percent Reduction |
|---|---|---|---|---|---|---|---|
| | | WLA (counts/ 30 days)[1] | WLAsw (counts/ 30 days) | LA (counts/ 30 days) | MOS (counts/ 30 days) | TMDL (counts/ 30 days) | |
| Alcovy River - Headwaters to Walton Co Line | 2.25E+13 | | 6.84E+12 | 1.96E+12 | 9.78E+11 | 9.78E+12 | 56 |
| Alcovy River - Cedar Creek to Bay Creek | 5.74E+13 | | 5.87E+12 | 2.33E+12 | 9.11E+11 | 9.11E+12 | 84 |
| Alcovy River - Mountain Creek to Big Flat Creek | 2.79E+13 | | 5.91E+12 | 1.03E+13 | 1.80E+12 | 1.80E+13 | 36 |
| Alligator Creek | 2.18E+12 | 2.37E+10 | | 3.11E+11 | 3.72E+10 | 3.72E+11 | 83 |
| Almand Branch | 3.94E+12 | 1.48E+11 | 2.42E+12 | 5.44E+11 | 3.46E+11 | 3.46E+12 | 12 |
| Bay Creek - Headwaters to Beaver Creek | 5.64E+11 | 2.26E+11 | | 5.21E+09 | 2.57E+10 | 2.57E+11 | 54 |
| Bay Creek - Headwaters to Alcovy River | 9.87E+12 | | 1.11E+12 | 1.05E+12 | 2.40E+11 | 2.40E+12 | 76 |
| Beaver Ruin Creek | 5.05E+13 | | 4.68E+12 | 1.34E+12 | 6.68E+11 | 6.68E+12 | 87 |
| Big Flat Creek | 1.35E+13 | 1.52E+11 | 4.65E+11 | 3.37E+12 | 4.43E+11 | 4.43E+12 | 67 |
| Big Haynes Creek - Headwaters to Brushy Creek | 6.85E+12 | | 2.13E+12 | 6.10E+11 | 3.05E+11 | 3.05E+12 | 55 |
| Big Haynes Creek - Brushy Creek to Little Panther Creek | 1.21E+13 | | 5.04E+12 | 2.08E+12 | 7.91E+11 | 7.91E+12 | 35 |
| Big Haynes Creek - Little Haynes Creek to Yellow River | 1.17E+14 | | 2.31E+13 | 4.00E+13 | 7.01E+12 | 7.01E+13 | 40 |
| ig Indian Creek | 3.14E+14 | 9.19E+11 | 5.15E+12 | 1.60E+14 | 1.84E+13 | 1.84E+14 | 41 |
| Big Sandy Creek | 2.86E+12 | | | 2.48E+12 | 2.76E+11 | 2.76E+12 | 4 |
| Bromolow Creek | 3.75E+13 | | 7.93E+12 | 2.26E+12 | 1.13E+12 | 1.13E+13 | 70 |
| Brushy Fork Creek | 2.89E+12 | | 1.20E+12 | 5.52E+11 | 1.94E+11 | 1.94E+12 | 33 |
| Cabin Creek | 5.98E+12 | 4.84E+11 | 3.01E+11 | 1.15E+12 | 2.15E+11 | 2.15E+12 | 64 |
| Camp Creek | 1.64E+12 | | 7.51E+11 | 2.14E+11 | 1.07E+11 | 1.07E+12 | 35 |
| Cedar Creek | 2.20E+12 | | 8.89E+11 | 2.54E+11 | 1.27E+11 | 1.27E+12 | 42 |
| Cobbs Creek | 1.80E+13 | | 1.05E+12 | 3.00E+11 | 1.50E+11 | 1.50E+12 | 92 |
| Conley Creek | 6.89E+12 | | 1.20E+12 | 3.44E+11 | 1.72E+11 | 1.72E+12 | 75 |

| Stream Segment | Current Load (counts/ 30 days) | TMDL Components | | | | | Percent Reduction |
|---|---|---|---|---|---|---|---|
| | | WLA (counts/ 30 days)[1] | WLAsw (counts/ 30 days) | LA (counts/ 30 days) | MOS (counts/ 30 days) | TMDL (counts/ 30 days) | |
| Doless Creek | 9.24E+11 | | 1.88E+10 | 5.36E+09 | 2.68E+09 | 2.68E+10 | 97 |
| Doolittle Creek | 2.25E+13 | | 8.23E+11 | 2.35E+11 | 1.18E+11 | 1.18E+12 | 95 |
| Falling Creek | 8.39E+12 | | | 6.80E+12 | 7.56E+11 | 7.56E+12 | 10 |
| Gully Creek | 2.60E+11 | | | 1.25E+11 | 1.39E+10 | 1.39E+11 | 46 |
| Honey Creek | 2.45E+13 | | 1.69E+12 | 1.02E+12 | 3.01E+11 | 3.01E+12 | 88 |
| Hopkins Creek | 2.91E+12 | | 4.88E+11 | 1.40E+11 | 6.98E+10 | 6.98E+11 | 76 |
| House Creek | 2.43E+12 | | | 1.09E+12 | 1.21E+11 | 1.21E+12 | 50 |
| Intrenchment Creek | 3.52E+12 | | 1.19E+12 | 3.39E+11 | 1.69E+11 | 1.69E+12 | 52 |
| Jacks Creek | 2.27E+12 | | 9.20E+11 | 2.63E+11 | 1.31E+11 | 1.31E+12 | 20 |
| Jackson Creek | 2.43E+13 | 6.37E+11 | 4.27E+12 | 5.82E+11 | 6.09E+11 | 6.09E+12 | 75 |
| Little Haynes Creek | 9.32E+12 | | 9.20E+11 | 4.01E+12 | 5.47E+11 | 5.47E+12 | 41 |
| Little Stone Mountain | 1.14E+12 | | 3.68E+11 | 1.05E+11 | 5.26E+10 | 5.26E+11 | 54 |
| Little Suwannee Creek | 5.71E+12 | | 1.63E+12 | 4.66E+11 | 2.33E+11 | 2.33E+12 | 59 |
| McClain Branch | 1.60E+12 | 6.83E+10 | 6.13E+11 | 1.07E+11 | 8.76E+10 | 8.76E+11 | 45 |
| Mosquito Creek | 3.53E+12 | | | 1.34E+12 | 1.49E+11 | 1.49E+12 | 58 |
| No Business Creek | 2.28E+12 | 2.05E+11 | 1.05E+12 | 9.47E+10 | 1.50E+11 | 1.50E+12 | 34 |
| North Branch South River | No Data | | | | No Data | No Data | No Data |
| Ocmulgee River | 4.55E+14 | | 4.05E+13 | 2.66E+14 | 3.41E+13 | 3.41E+14 | 25 |
| Pew Creek | 3.58E+12 | | 1.40E+12 | 4.00E+11 | 2.00E+11 | 2.00E+12 | 3 |
| Rocky Creek | 1.48E+12 | | 4.66E+11 | 2.74E+11 | 8.22E+10 | 8.22E+11 | 44 |
| Rum Creek | 2.29E+14 | | | 3.44E+13 | 3.82E+12 | 3.82E+13 | 83 |
| Shetley Creek | 9.89E+11 | | 2.48E+11 | 7.08E+10 | 3.54E+10 | 3.54E+11 | 64 |

| Stream Segment | Current Load (counts/ 30 days) | TMDL Components | | | | | Percent Reduction |
|---|---|---|---|---|---|---|---|
| | | WLA (counts/ 30 days)[1] | WLAsw (counts/ 30 days) | LA (counts/ 30 days) | MOS (counts/ 30 days) | TMDL (counts/ 30 days) | |
| Shoal Creek - Headwaters to Alcovy River, Lawrenceville | 6.50E+12 | | 8.55E+11 | 2.44E+11 | 1.22E+11 | 1.22E+12 | 81 |
| Shoal Creek - Headwaters to South River | 6.13E+12 | | 8.73E+11 | 2.49E+11 | 1.25E+11 | 1.25E+12 | 80 |
| Snapfinger Creek | 7.16E+13 | | 4.03E+12 | 1.15E+12 | 5.76E+11 | 5.76E+12 | 92 |
| Snapping Shoals Creek | 8.75E+12 | 4.78E+10 | 9.12E+11 | 2.82E+12 | 4.20E+11 | 4.20E+12 | 52 |
| South River - Atlanta to Flakes Mill Road | 6.00E+14 | | 1.07E+13 | 3.05E+12 | 1.52E+12 | 1.52E+13 | 97 |
| South River - Flakes Mill Road to Pole Bridge Creek | 1.81E+14 | 5.97E+12 | 1.29E+13 | 6.42E+11 | 2.17E+12 | 2.17E+13 | 88 |
| South River - Pole Bridge Creek to Hwy 20 | 3.12E+14 | 2.66E+12 | 3.11E+13 | 1.38E+13 | 5.29E+12 | 5.29E+13 | 83 |
| South River - Hwy 20 to Snapping Shoals Creek | 7.96E+13 | | 2.54E+13 | 1.93E+13 | 4.97E+12 | 4.97E+13 | 38 |
| South River - Snapping Shoals to Jackson Lake | 2.63E+15 | | 1.93E+14 | 1.72E+14 | 4.06E+13 | 4.06E+14 | 85 |
| Stone Mountain Creek | 1.01E+12 | | 5.94E+11 | 1.70E+11 | 8.49E+10 | 8.49E+11 | 16 |
| Sugar Creek - u/s Memorial Drive to South River | 4.22E+12 | | 6.92E+11 | 1.98E+11 | 9.89E+10 | 9.89E+11 | 77 |
| Sugar Creek - Turnpike Creek to Little Ocmulgee River | 1.07E+14 | | | 9.14E+13 | 1.02E+13 | 1.02E+14 | 5 |
| Sweetwater Creek | 3.12E+13 | 6.37E+11 | 8.84E+12 | 1.89E+12 | 1.26E+12 | 1.26E+13 | 60 |
| Swift Creek | 3.77E+13 | | 1.40E+13 | 4.00E+12 | 2.00E+12 | 2.00E+13 | 47 |
| Tobesofkee Creek - Barnesville to Cole Creek | 6.20E+13 | 1.75E+11 | | 1.34E+12 | 1.68E+11 | 1.68E+12 | 97 |
| Tobesofkee Creek - Cole Creek to Todd Creek | 6.53E+12 | | | 1.73E+12 | 1.93E+11 | 1.93E+12 | 70 |
| Tobesofkee Creek - Lake Tobesofkee to Rocky Creek | 8.67E+13 | | 1.41E+13 | 4.04E+12 | 2.02E+12 | 2.02E+13 | 77 |
| Towaliga River | 2.34E+13 | | 4.62E+11 | 8.03E+12 | 9.44E+11 | 9.44E+12 | 60 |
| Town Branch | 3.88E+11 | 2.82E+10 | | 1.60E+11 | 2.09E+10 | 2.09E+11 | 46 |
| Turkey Creek | 1.00E+12 | | 2.64E+11 | 7.55E+10 | 3.77E+10 | 3.77E+11 | 62 |
| Turnpike Creek | 7.09E+13 | | | 3.99E+13 | 4.43E+12 | 4.43E+13 | 38 |
| Tussahaw Creek | 5.97E+13 | | 6.20E+10 | 7.91E+12 | 8.86E+11 | 8.86E+12 | 85 |
| Walnut Creek | 1.47E+13 | 1.93E+11 | 3.14E+11 | 3.16E+12 | 4.07E+11 | 4.07E+12 | 72 |

| Stream Segment | Current Load (counts/ 30 days) | TMDL Components | | | | | Percent Reduction |
|---|---|---|---|---|---|---|---|
| | | WLA (counts/ 30 days)[1] | WLAsw (counts/ 30 days) | LA (counts/ 30 days) | MOS (counts/ 30 days) | TMDL (counts/ 30 days) | |
| Watson Creek | 1.24E+12 | | 6.53E+11 | 1.87E+11 | 9.33E+10 | 9.33E+11 | 25 |
| Wise Creek | 3.40E+12 | | | 2.85E+12 | 3.16E+11 | 3.16E+12 | 7 |
| Yellow River - Headwaters to Harris Lake | 2.85E+13 | | 1.54E+12 | 4.41E+11 | 2.20E+11 | 2.20E+12 | 92 |
| Yellow River - Harris Lake to Pew Creek | 3.11E+13 | | 8.19E+12 | 2.34E+12 | 1.17E+12 | 1.17E+13 | 62 |
| Yellow River - Sweetwater Creek to Centerville Creek | 7.97E+13 | 1.77E+12 | 2.83E+13 | 6.30E+12 | 4.04E+12 | 4.04E+13 | 49 |
| Yellow River - Centerville Creek to Hammock Creek | 4.52E+13 | | 1.54E+13 | 1.13E+13 | 2.97E+12 | 2.97E+13 | 34 |
| Yellow River - Hammock Creek to Big Haynes Creek | 1.04E+14 | 1.06E+12 | 2.03E+13 | 1.54E+13 | 4.09E+12 | 4.09E+13 | 61 |
| Yellow River - Big Haynes Creek to Jackson Lake | 3.54E+14 | | 4.12E+13 | 5.51E+13 | 1.07E+13 | 1.07E+14 | 70 |

Notes: [1] The assigned fecal coliform load from each NPDES permitted facility for WLA was determined as the product of the fecal coliform permit limit and the facility average monthly discharge at the time of the critical load.

# 1.0 INTRODUCTION

## 1.1 Background

The State of Georgia assesses its water bodies for compliance with water quality standards criteria established for their designated uses as required by the Federal Clean Water Act (CWA). Assessed water bodies are placed into one of three categories with respect to designated uses: 1) supporting, 2) partially supporting, or 3) not supporting. These water bodies are found on Georgia's 305(b) list as required by that section of the CWA that addresses the assessment process, and are published in *Water Quality in Georgia* (GA EPD, 2000 – 2001). This document is available on the Georgia Environmental Protection Division (GA EPD) website.

Some of the 305(b) partially and not supporting water bodies are also assigned to Georgia's 303(d) list, also named after that section of the CWA. Water bodies on the 303(d) list are required to have a Total Maximum Daily Load (TMDL) evaluation for the water quality constituent(s) in violation of the water quality standard. The TMDLs in this document are based on the draft 2006 303(d) listing, which is available on the GA EPD website. This document also includes revised TMDLs for the segments that were included in the 2002 Ocmulgee River Basin Fecal Coliform TMDL. The TMDL process establishes the allowable loading of pollutants or other quantifiable parameters for a water body based on the relationship between pollution sources and in-stream water quality conditions. This allows water quality based controls to be developed to reduce pollution and restore and maintain water quality.

The list identifies the waterbodies as either partially supporting or not supporting their designated use classifications, due to exceedances of water quality standards for fecal coliform bacteria. Fecal coliform bacteria are used as an indicator of the potential presence of pathogens in a stream. Table 1 presents the twelve streams of the Ocmulgee River Basin included on the draft 2006 303(d) list for exceedances of the fecal coliform standard criteria. A total of two stream segments were listed as partially supporting their designated use and ten stream segments were listed as not supporting their designated use on the draft 2006 303(d) list. Table 2 lists the sixty-two streams segments in the Ocmulgee River Basin where the 2002 TMDLs are being revised.

## 1.2 Watershed Description

The Ocmulgee River Basin is located in central Georgia, occupying an area of 6,102 square miles, originating in the eastern edges of the City of Atlanta. The Ocmulgee River basin falls within the Level III Piedmont and Southeastern Plains Ecoregions. The Upper Ocmulgee River watershed is located in the Level IV Southern Outer Piedmont Subecoregion. The Lower and Little Ocmulgee River watersheds are multifaceted watersheds, with portions of the watersheds located in the Level IV Southern Outer Piedmont, the Sand Hills, the Coastal Plain Red Uplands and the Atlantic Southern Loam Plains. There is also a corridor, running the length of the river and extending (approximately) one half to two miles inland on each side of the River, which lies in the Southeastern Floodplains and Low Terraces Subecoregion. Typical characteristics for these subecoregions are as follows:

- Southern Outer Piedmont - this region contains mostly rolling to hilly terrain; mostly red clayey soils; southern most boundary occurs at the fall line; major forest type is loblolly short-leafed pine.

## Table 1. Water Bodies Listed on the Draft 2006 303(d) List for Fecal Coliform Bacteria in the Ocmulgee River Basin

| Stream Segment | Location | Segment Length (miles) | Designated Use | Listing |
|---|---|---|---|---|
| Alcovy River | Headwaters to Walton Co Line (Gwinnett Co) | 15 | Fishing | NS |
| Alcovy River | Mountain Creek to Big Flat Creek (Walton/Newton Co) | 7 | Drinking Water | PS |
| Bay Creek | Headwaters to Alcovy River (Gwinnett/Walton Co) | 9 | Fishing | NS |
| Brushy Fork Creek | Lake Carlton to Big Haynes Creek (Gwinnett Co) | 5 | Fishing | NS |
| Gully Creek | Rocky Branch to Ocmulgee River (Jeff Davis Co) | 4 | Fishing | NS |
| Mosquito Creek | Headwaters to Ocmulgee River (Dodge/Pulaski Co) | 18 | Fishing | PS |
| Sugar Creek | Turnpike Creek to Little Ocmulgee River (Telfair Co) | 5 | Fishing | NS |
| Tobesofkee Creek | Barnesville to Cole Creek (Lamar/Monroe Co) | 8 | Fishing | NS |
| Towaliga River | Indian Creek to High Falls Lake (Butt Co) | 7 | Fishing | NS |
| Yellow River | Headwaters to Harris Lake (Gwinnett Co) | 3 | Fishing | NS |
| Yellow River | Harris Lake to Pew Creek (Gwinnett Co) | 7 | Fishing | NS |
| Yellow River | Centerville Creek to Hammock Creek (Gwinnett/DeKalb/Rockdale Co) | 8 | Fishing | NS |
| Yellow River | Centerville Creek to Hammock Creek (Gwinnett/DeKalb/Rockdale Co) | 8 | Fishing | NS |

Notes:
PS = Partially Supporting designated uses
NS = Not Supporting designated uses

## Table 2. Water Bodies with Revised TMDLs for Fecal Coliform Bacteria in the Ocmulgee River Basin

| Stream Segment | Location | Segment Length (miles) | Designated Use |
|---|---|---|---|
| Alcovy River | Cedar Creek to Bay Creek (Walton Co) | 4 | Fishing/ Drinking Water |
| Alligator Creek | Batson Creek to Lime Sink Creek (Dodge/Laurens Co) | 12 | Fishing |
| Almand Branch | Tanyard Branch to Snapping Shoals (Rockdale Co) | 5 | Fishing |
| Bay Creek | Headwaters to Beaver Creek (Peach/Houston Co) | 9 | Fishing |
| Beaver Ruin Creek | Gwinnett County | 8 | Fishing |
| Big Flat Creek | Headwaters to Flat Creek (Walton Co) | 13 | Fishing |
| Big Haynes Creek | Headwaters to Brushy Fork Creek (Gwinnett Co) | 9 | Fishing/ Drinking Water |
| Big Haynes Creek | Brushy Fork Creek to Little Panther Creek (Rockdale Co) | 2 | Drinking Water |
| Big Haynes Creek | Little Haynes Creek to Yellow River (Rockdale Co) | 5 | Drinking Water |
| Big Indian Creek | Mossy Creek to Ocmulgee River (Houston Co) | 7 | Fishing |
| Big Sandy Creek | Aboothlacoosta Creek to Ocmulgee River | 10 | Fishing |
| Bromolow Creek | Headwaters to Beaver Ruin Creek (Gwinnett Co) | 5 | Fishing |
| Cabin Creek | Headwaters, Griffin to Towaliga River (Spalding Co) | 16 | Fishing |
| Camp Creek | Headwaters to Jackson Creek (DeKalb/Gwinnett Co) | 6 | Fishing |
| Cedar Creek | Headwaters to Alcovy River (Gwinnett Co) | 4 | Fishing |
| Cobbs Creek | Headwaters to Shoal Creek (DeKalb co) | 7 | Fishing |
| Conley Creek | Headwaters to South River (Clayton/DeKalb Co) | 9 | Fishing |
| Doless Creek | Headwaters to Doolittle Creek (DeKalb Co) | 2 | Fishing |
| Doolittle Creek | Headwaters to South River (DeKalb Co) | 5 | Fishing |
| Falling Creek | Little Falling Creek to Ocmulgee River (Jones Co) | 9 | Fishing |
| Honey Creek | Headwaters to South River (DeKalb/Rockdale Co) | 13 | Fishing |
| Hopkins Creek | Headwaters to Alcovy River (Gwinnett Co) | 4 | Fishing |
| House Creek | Ball Creek to Little House Creek (Wilcox/Ben Hill Co) | 8 | Fishing |
| Intrenchment Creek | Headwaters to South River, Atlanta (Fulton/DeKalb Co) | 6 | Fishing |
| Jacks Creek | Headwaters to Yellow River (Gwinnett Co) | 4 | Fishing |
| Jackson Creek | Gwinnett County | 7 | Fishing |
| Little Haynes Creek | Hwy 20 to Big Haynes Creek (Walton/Rockdale Co) | 11 | Fishing |
| Little Stone Mountain Cr | Headwaters to Stone Mountain Lake (DeKalb Co) | 3 | Fishing |
| Little Suwannee Creek | Lake Perrin to Yellow River (Gwinnett Co) | 3 | Fishing |
| McClain Branch | Headwaters to Honey Creek (Rockdale Co) | 2 | Fishing |
| No Business Creek | Headwaters to Norris Lake (Gwinnett Co) | 6 | Fishing |

| Stream Segment | Location | Segment Length (miles) | Designated Use |
|---|---|---|---|
| North Branch South River | Atlanta (Fulton Co) | 3 | Fishing |
| Ocmulgee River | Sandy Run Creek to Big Indian Creek (Houston/Twiggs/Bleckley Co) | 23 | Fishing |
| Pew Creek | Gwinnett County | 4 | Fishing |
| Rocky Creek | 1 mile u/s Rocky Creek Road to Tobesofkee Creek, Macon (Bibb Co) | 5 | Fishing |
| Rum Creek | Rum and Town Creeks, U/S Lake Juliette (Monroe Co) | 6 | Fishing |
| Shetley Creek | Headwaters to Bromolow Creek (Gwinnett Co) | 2 | Fishing |
| Shoal Creek | Headwaters to Alcovy River, Lawrenceville (Gwinnett Co) | 5 | Fishing |
| Shoal Creek | Headwaters to South River (DeKalb Co) | 7 | Fishing |
| Snapfinger Creek | DeKalb County | 18 | Fishing |
| Snapping Shoals Creek | Almand Branch to South River (Rockdale/Newton Co) | 10 | Fishing |
| South River | Atlanta to Flakes Mill Road (Fulton/DeKalb Co) | 16 | Fishing |
| South River | Flakes Mill Road to Pole Bridge Creek (DeKalb Co) | 9 | Fishing |
| South River | Pole Bridge Creek to Hwy 20 (Rockdale/Henry Co) | 15 | Fishing |
| South River | Hwy 20 to Snapping Shoals Creek (Henry/Newton Co) | 11 | Fishing |
| South River | Snapping Shoals to Jackson Lake (Newton Co) | 7 | Fishing |
| Stone Mountain Creek | Headwaters to Stone Mountain Lake (DeKalb Co) | 4 | Fishing |
| Sugar Creek | u/s Memorial Drive to South River (DeKalb Co) | 6 | Fishing |
| Sweetwater Creek | Lee Daniel Creek to Yellow River (Gwinnett Co) | 6 | Fishing |
| Swift Creek | Headwaters to Yellow River (DeKalb Co) | 5 | Fishing |
| Tobesofkee Creek | Cole Creek to Todd Creek (Monroe Co) | 8 | Fishing |
| Tobesofkee Creek | Lake Tobesofkee to Rocky Creek (Bibb Co) | 10 | Fishing |
| Town Branch | Headwaters (Jackson) to Aboothlacoosta Creek (Butts Co) | 3 | Fishing |
| Turkey Creek | Headwaters to Yellow River (Gwinnett Co) | 4 | Fishing |
| Turnpike Creek | Hwy 280 to Sugar Creek (Telfair Co) | 24 | Fishing |
| Tussahaw Creek | Wolf Creek to Lake Jackson (Butts Co) | 6 | Fishing |
| Walnut Creek | Headwaters to Ocmulgee River (Jones/Bibb Co) | 20 | Fishing |
| Watson Creek | Headwaters to Yellow River (Gwinnett Co) | 3 | Fishing |
| Wise Creek | Headwaters to Ocmulgee River (Jasper Co) | 6 | Fishing |
| Yellow River | Sweetwater Creek to Centerville Creek (Gwinnett Co) | 15 | Fishing |
| Yellow River | Hammock Creek to Big Haynes Creek (Rockdale Co) | 9 | Fishing |
| Yellow River | Big Haynes Creek to Jackson Lake (Newton Co) | 25 | Fishing |

Notes:
PS = Partially Supporting designated uses
NS = Not Supporting designated uses

- Sand Hills – rolling to hilly, highly dissected coastal plain belt; generally low nutrient sand and clay soils.

- Coastal Plain Red Uplands - this region contains mostly well drained soils composed of red sand and clay; the majority of the land is utilized as cropland or pasture.

- Atlantic Southern Loam Plains - this region contains soils ranging from poorly drained to excessively drained; longleaf pine, oak and some distinctive evergreen shrubs are common vegetation.

- Southeastern Floodplains and Low Terraces – this region contains large sluggish rivers and backwaters with ponds, swamps and oxbow lakes; terraces are typically covered by oak forests, while forests of bald cypress and water tupelo grow in the swamps and river areas.

The Ocmulgee River Basin includes three United States Geologic Survey (USGS) eight-digit hydrologic units, HUC 03070103 (Upper Ocmulgee River watershed), HUC 03070104 (Lower Ocmulgee River watershed), and HUC 03070105 (Little Ocmulgee River watershed). The Upper Ocmulgee Basin is made up of the South River, Yellow River, and Alcovy River subwatersheds. These converge at Lake Jackson to form the Ocmulgee River. The Ocmulgee River flows south and southeast, runs through the northeast side of the City of Macon, and then travels approximately 115 miles until it finally joins the Oconee River near the City of Hazlehurst, to form the Altamaha River. The Altamaha River then continues in a southeastern direction to the Atlantic Ocean. Figures 1-3 show the locations of these sub-basins, the listed segments within each sub-basin, and the associated counties within each sub-basin.

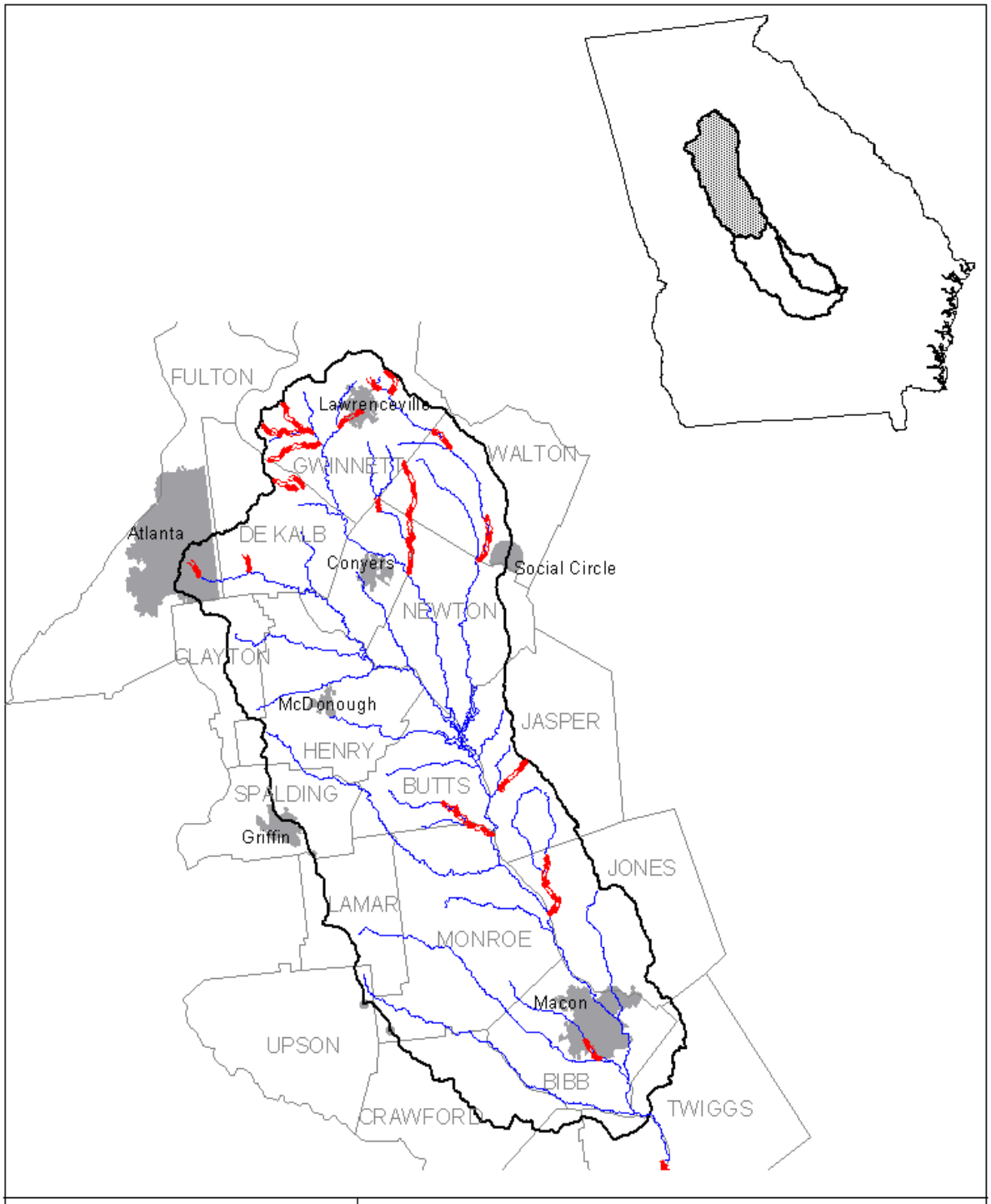
The land use characteristics of the Ocmulgee River Basin watersheds were determined using data from the National Land Cover Dataset (NLCD) for Georgia. This coverage was produced from Landsat Thematic Mapper digital images developed in 2001. Land use classification is based on a modified Anderson level one and two system. Table 3 lists the watershed land coverage distribution of the 74 stream segments.

## 1.3 Water Quality Standard

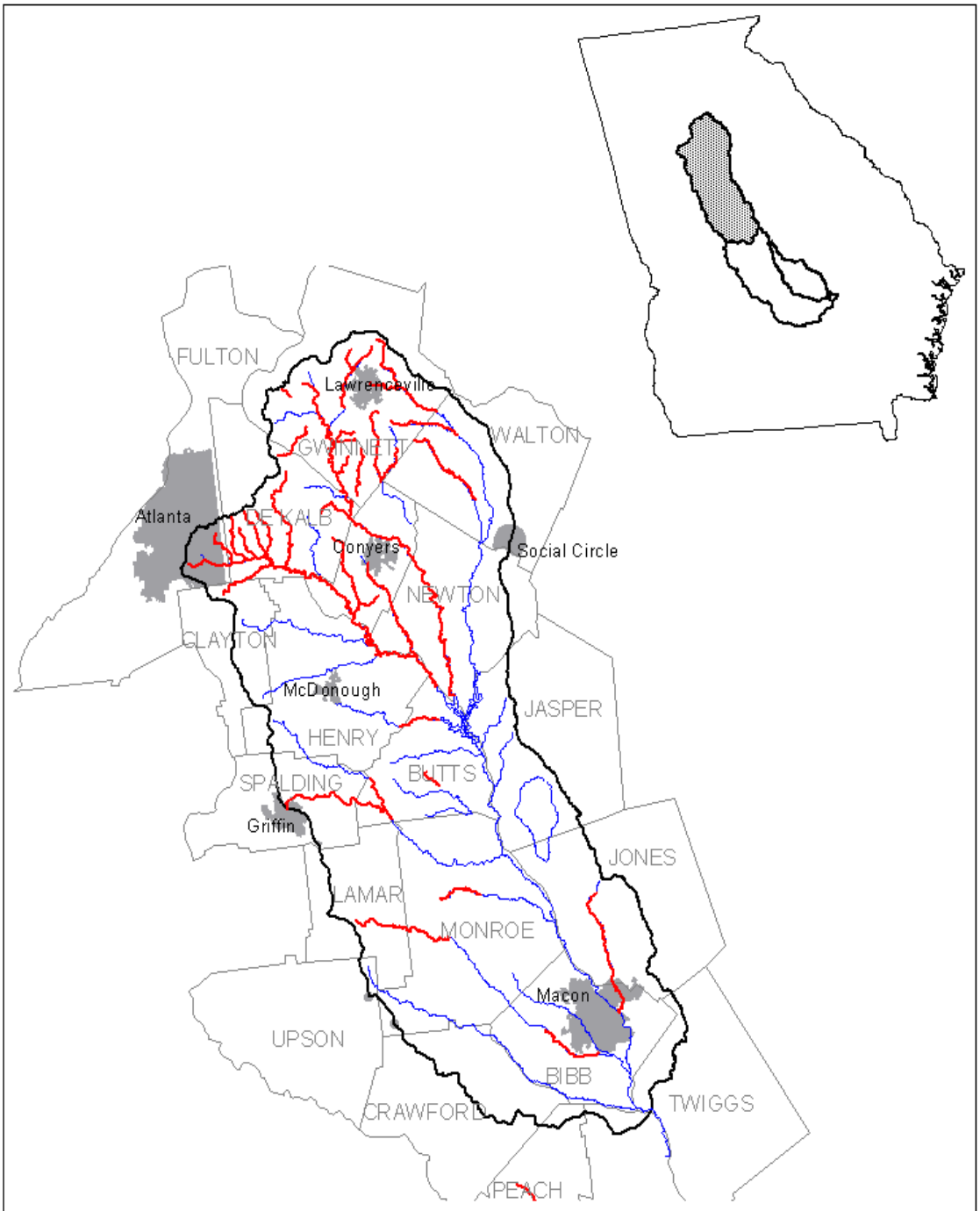
The water use classification for the listed stream segments in the Ocmulgee River Basin is Fishing. The criterion violated is listed as fecal coliform. The potential cause(s) listed include urban runoff, nonpoint sources, and municipal facilities. The use classification water quality standards for fecal coliform bacteria, as stated in the *State of Georgia's Rules and Regulations for Water Quality Control*, Chapter 391-3-6-.03(6)(c)(iii) (GA EPD, 2005), are:

Bacteria: For the months of May through October, when water contact recreation activities are expected to occur, fecal coliform not to exceed a geometric mean of 200 per 100 ml based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200/100 ml (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 per 100 ml in lakes and reservoirs and 500 per 100 ml in free flowing freshwater streams. For the months of November through April, fecal coliform not to exceed a geometric mean of 1,000 per 100 ml based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 per 100 ml for any sample. The State does not encourage swimming in surface waters since a number of factors, which are beyond the control of any State regulatory agency, contribute to elevated levels of fecal coliform. For waters designated as approved shellfish harvesting waters by the appropriate State agencies, the requirements will be consistent with

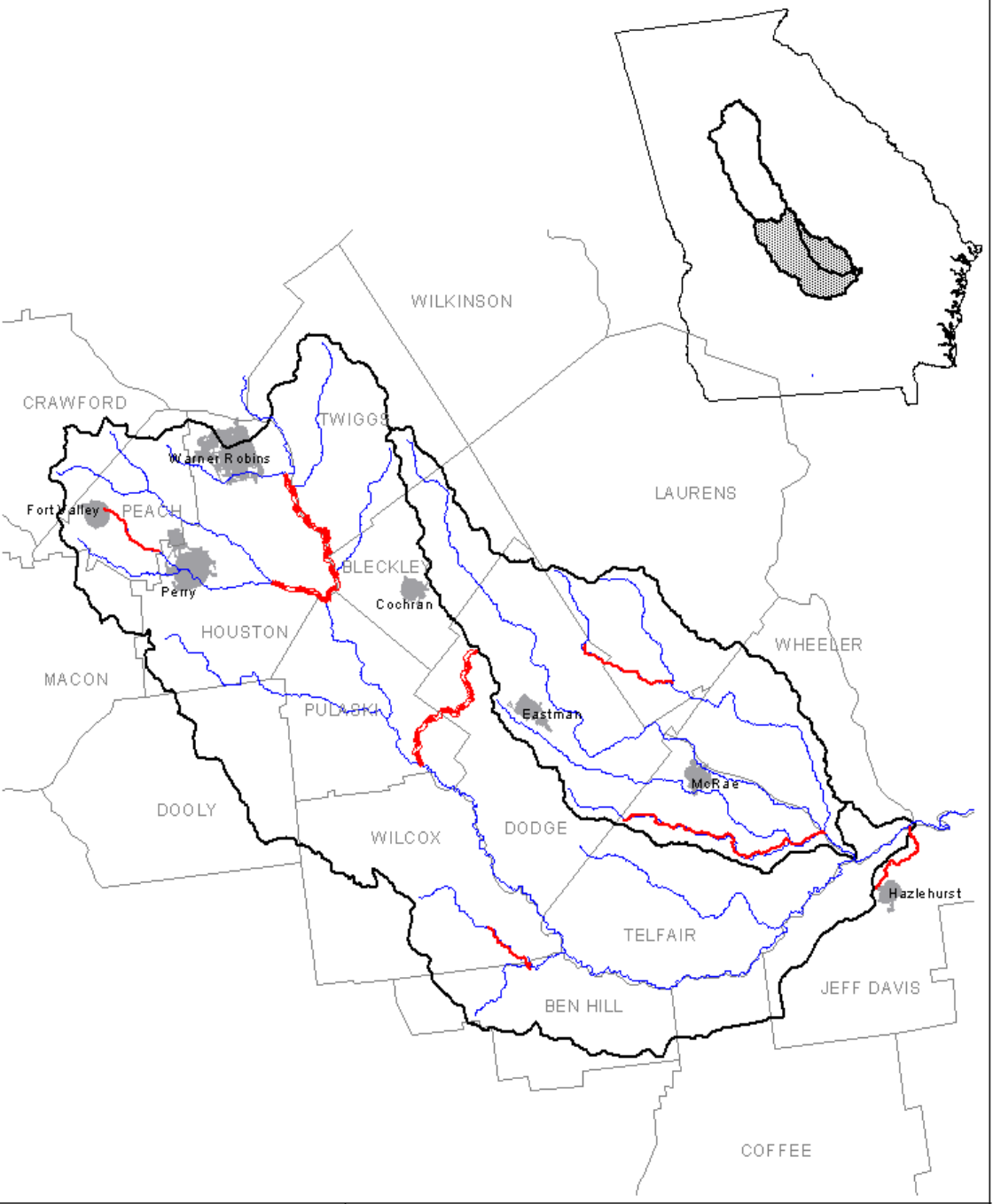
those established by the State and Federal agencies responsible for the National Shellfish Sanitation Program. The requirements are found in the National Shellfish Sanitation Program Manual of Operation, Revised 1988, Interstate Shellfish Sanitation Conference, U. S. Department of Health and Human Services (PHS/FDA), and the Center for Food Safety and Applied Nutrition. Streams designated as generally supporting shellfish are listed in Paragraph 391-3-6-.03(14).




| | |
|---|---|
| TMDL Evaluation - Fecal Coliform<br>Ocmulgee River Basin | Figure 1. Partially Supporting Stream Segments in HUC 03070103 |




| | |
|---|---|
| TMDL Evaluation - Fecal Coliform<br>Ocmulgee River Basin | Figure 2. Not Supporting Stream Segments in HUC 03070103 |




| | |
|---|---|
| TMDL Evaluation - Fecal Coliform<br>Ocmulgee River Basin | Figure 3. Impaired Stream Segments in HUCs 03070104 and 03070105 |

## Table 3. Ocmulgee River Basin Land Coverage

| Stream/Segment | Landuse Categories - Acres (Percent) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Open Water | Low Intensity Residential | High Intensity Residential | High Intensity Commercial, Industrial, Transportation | Bare Rock, Sand, Clay | Quarries, Strip Mines, Gravel Pits | Forest | Row Crops | Pasture, Hay | Other Grasses (Urban, recreational; e.g. parks, lawns) | Woody Wetlands | Emergent Herbaceous Wetlands | Total |
| Alcovy River Headwaters to Walton Co Line | 277 | 4,263 | 5,110 | 1,675 | 523 | 203 | 13,870 | 2 | 4,398 | 1,887 | 473 | 3 | 32,684 |
| | (0.8) | (13.0) | (15.6) | (5.1) | (1.6) | (0.6) | (42.4) | (0.0) | (13.5) | (5.8) | (1.4) | (0.0) | (100.0) |
| Alcovy River Cedar Creek to Bay Creek | 286 | 4,553 | 5,271 | 1,694 | 652 | 203 | 17,112 | 2 | 5,647 | 2,578 | 781 | 3 | 38,783 |
| | (0.7) | (11.7) | (13.6) | (4.4) | (1.7) | (0.5) | (44.1) | (0.0) | (14.6) | (6.6) | (2.0) | (0.0) | (100.0) |
| Alcovy River Mountain Creek to Big Flat Creek | 955 | 8,744 | 7,187 | 2,121 | 1,389 | 349 | 42,790 | 54 | 15,187 | 7,733 | 3,993 | 15 | 90,516 |
| | (1.1) | (9.7) | (7.9) | (2.3) | (1.5) | (0.4) | (47.3) | (0.1) | (16.8) | (8.5) | (4.4) | (0.0) | (100.0) |
| Alligator Creek | 210 | 1,827 | 120 | 8 | 0 | 12 | 23,827 | 5,505 | 3,209 | 4,416 | 4,614 | 283 | 44,031 |
| | (0.5) | (4.1) | (0.3) | (0.0) | (0.0) | (0.0) | (54.1) | (12.5) | (7.3) | (10.0) | (10.5) | (0.6) | (100.0) |
| Almand Branch | 83 | 1,756 | 2,196 | 1,628 | 93 | 83 | 3,222 | 3 | 789 | 258 | 257 | 0 | 10,366 |
| | (0.8) | (16.9) | (21.2) | (15.7) | (0.9) | (0.8) | (31.1) | (0.0) | (7.6) | (2.5) | (2.5) | (0.0) | (100.0) |
| Bay Creek Headwaters to Beaver Creek | 17 | 838 | 260 | 229 | 0 | 0 | 4,130 | 1,524 | 1,626 | 1,286 | 651 | 17 | 10,578 |
| | (0.2) | (7.9) | (2.5) | (2.2) | (0.0) | (0.0) | (39.0) | (14.4) | (15.4) | (12.2) | (6.2) | (0.2) | (100.0) |
| Bay Creek Headwaters to Alcovy River | 66 | 877 | 637 | 35 | 157 | 146 | 4,851 | 3 | 2,094 | 853 | 500 | 3 | 10,220 |
| | (0.6) | (8.6) | (6.2) | (0.3) | (1.5) | (1.4) | (47.5) | (0.0) | (20.5) | (8.3) | (4.9) | (0.0) | (100.0) |
| Beaver Ruin Creek | 146 | 2,796 | 4,154 | 4,152 | 40 | 452 | 1,988 | 10 | 301 | 152 | 483 | 2 | 14,676 |
| | (1.0) | (19.1) | (28.3) | (28.3) | (0.3) | (3.1) | (13.5) | (0.1) | (2.1) | (1.0) | (3.3) | (0.0) | (100.0) |
| Big Flat Creek | 280 | 1,880 | 1,049 | 191 | 221 | 0 | 7,336 | 49 | 5,728 | 1,433 | 683 | 0 | 18,850 |
| | (1.5) | (10.0) | (5.6) | (1.0) | (1.2) | (0.0) | (38.9) | (0.3) | (30.4) | (7.6) | (3.6) | (0.0) | (100.0) |
| Big Haynes Creek Headwaters to Brushy Creek | 138 | 2,108 | 2,908 | 308 | 167 | 0 | 4,387 | 2 | 2,088 | 330 | 128 | 0 | 12,564 |
| | (1.1) | (16.8) | (23.1) | (2.5) | (1.3) | (0.0) | (34.9) | (0.0) | (16.6) | (2.6) | (1.0) | (0.0) | (100.0) |
| Big Haynes Creek Brushy Ck to Little Panther Ck | 225 | 3,098 | 4,151 | 487 | 348 | 0 | 7,811 | 8 | 4,547 | 967 | 311 | 0 | 21,953 |
| | (1.0) | (14.1) | (18.9) | (2.2) | (1.6) | (0.0) | (35.6) | (0.0) | (20.7) | (4.4) | (1.4) | (0.0) | (100.0) |
| Big Haynes Creek Little Haynes Creek to Yellow River | 1,055 | 5,515 | 5,330 | 775 | 683 | 107 | 23,785 | 22 | 10,726 | 3,361 | 1,297 | 0 | 52,658 |
| | (2.0) | (10.5) | (10.1) | (1.5) | (1.3) | (0.2) | (45.2) | (0.0) | (20.4) | (6.4) | (2.5) | (0.0) | (100.0) |
| Big Indian Creek | 943 | 14,677 | 4,282 | 1,604 | 6 | 346 | 104,811 | 35,408 | 29,632 | 22,980 | 18,521 | 1,309 | 234,518 |
| | (0.4) | (6.3) | (1.8) | (0.7) | (0.0) | (0.1) | (44.7) | (15.1) | (12.6) | (9.8) | (7.9) | (0.6) | (100.0) |

| Stream/Segment | Landuse Categories - Acres (Percent) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Open Water | Low Intensity Residential | High Intensity Residential | High Intensity Commercial, Industrial, Transportation | Bare Rock, Sand, Clay | Quarries, Strip Mines, Gravel Pits | Forest | Row Crops | Pasture, Hay | Other Grasses (Urban, recreational; e.g. parks, lawns) | Woody Wetlands | Emergent Herbaceous Wetlands | Total |
| Big Sandy Creek | 234 | 1,881 | 256 | 115 | 200 | 86 | 23,989 | 6 | 4,644 | 3,607 | 1,189 | 6 | 36,214 |
| | (0.6) | (5.2) | (0.7) | (0.3) | (0.6) | (0.2) | (66.2) | (0.0) | (12.8) | (10.0) | (3.3) | (0.0) | (100.0) |
| Bromolow Creek | 23 | 1,412 | 2,209 | 2,112 | 8 | 193 | 1,135 | 0 | 163 | 55 | 204 | 2 | 7,518 |
| | (0.3) | (18.8) | (29.4) | (28.1) | (0.1) | (2.6) | (15.1) | (0.0) | (2.2) | (0.7) | (2.7) | (0.0) | (100.0) |
| Brushy Fork Creek | 71 | 891 | 1,172 | 175 | 159 | 0 | 2,600 | 7 | 2,193 | 590 | 149 | 0 | 8,007 |
| | (0.9) | (11.1) | (14.6) | (2.2) | (2.0) | (0.0) | (32.5) | (0.1) | (27.4) | (7.4) | (1.9) | (0.0) | (100.0) |
| Cabin Creek | 239 | 1,888 | 1,053 | 298 | 46 | 82 | 11,627 | 13 | 4,652 | 1,090 | 666 | 0 | 21,655 |
| | (1.1) | (8.7) | (4.9) | (1.4) | (0.2) | (0.4) | (53.7) | (0.1) | (21.5) | (5.0) | (3.1) | (0.0) | (100.0) |
| Camp Creek | 17 | 1,398 | 947 | 673 | 16 | 0 | 1,506 | 0 | 156 | 30 | 54 | 0 | 4,797 |
| | (0.4) | (29.1) | (19.7) | (14.0) | (0.3) | (0.0) | (31.4) | (0.0) | (3.3) | (0.6) | (1.1) | (0.0) | (100.0) |
| Cedar Creek | 21 | 508 | 688 | 719 | 24 | 0 | 467 | 0 | 141 | 48 | 12 | 0 | 2,627 |
| | (0.8) | (19.3) | (26.2) | (27.4) | (0.9) | (0.0) | (17.8) | (0.0) | (5.4) | (1.8) | (0.5) | (0.0) | (100.0) |
| Cobbs Creek | 7 | 2,404 | 2,038 | 655 | 6 | 0 | 1,206 | 0 | 46 | 21 | 15 | 0 | 6,398 |
| | (0.1) | (37.6) | (31.9) | (10.2) | (0.1) | (0.0) | (18.8) | (0.0) | (0.7) | (0.3) | (0.2) | (0.0) | (100.0) |
| Conley Creek | 40 | 1,520 | 1,977 | 1,224 | 136 | 0 | 3,703 | 2 | 489 | 514 | 252 | 0 | 9,857 |
| | (0.4) | (15.4) | (20.1) | (12.4) | (1.4) | (0.0) | (37.6) | (0.0) | (5.0) | (5.2) | (2.6) | (0.0) | (100.0) |
| Doless Creek | 0 | 364 | 330 | 285 | 0 | 0 | 246 | 0 | 15 | 1 | 0 | 0 | 1,242 |
| | (0.0) | (29.3) | (26.6) | (22.9) | (0.0) | (0.0) | (19.8) | (0.0) | (1.2) | (0.1) | (0.0) | (0.0) | (100.0) |
| Doolittle Creek | 23 | 1,889 | 1,288 | 526 | 18 | 0 | 960 | 0 | 62 | 8 | 2 | 0 | 4,776 |
| | (0.5) | (39.6) | (27.0) | (11.0) | (0.4) | (0.0) | (20.1) | (0.0) | (1.3) | (0.2) | (0.0) | (0.0) | (100.0) |
| Falling Creek | 294 | 2,531 | 45 | 1 | 159 | 68 | 58,389 | 0 | 1,280 | 3,632 | 2,552 | 9 | 68,959 |
| | (0.4) | (3.7) | (0.1) | (0.0) | (0.2) | (0.1) | (84.7) | (0.0) | (1.9) | (5.3) | (3.7) | (0.0) | (100.0) |
| Gully Creek | 62 | 1,559 | 987 | 276 | 0 | 9 | 7,770 | 1,668 | 1,182 | 2,604 | 1,748 | 177 | 18,042 |
| | (0.3) | (8.6) | (5.5) | (1.5) | (0.0) | (0.0) | (43.1) | (9.2) | (6.6) | (14.4) | (9.7) | (1.0) | (100.0) |
| Honey Creek | 169 | 2,512 | 1,684 | 320 | 41 | 350 | 9,499 | 6 | 2,008 | 905 | 555 | 0 | 18,050 |
| | (0.9) | (13.9) | (9.3) | (1.8) | (0.2) | (1.9) | (52.6) | (0.0) | (11.1) | (5.0) | (3.1) | (0.0) | (100.0) |
| Hopkins Creek | 6 | 364 | 423 | 163 | 4 | 100 | 1,294 | 0 | 424 | 173 | 19 | 0 | 2,969 |
| | (0.2) | (12.3) | (14.2) | (5.5) | (0.1) | (3.4) | (43.6) | (0.0) | (14.3) | (5.8) | (0.6) | (0.0) | (100.0) |

| Stream/Segment | Landuse Categories - Acres (Percent) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Open Water | Low Intensity Residential | High Intensity Residential | High Intensity Commercial, Industrial, Transportation | Bare Rock, Sand, Clay | Quarries, Strip Mines, Gravel Pits | Forest | Row Crops | Pasture, Hay | Other Grasses (Urban, recreational; e.g. parks, lawns) | Woody Wetlands | Emergent Herbaceous Wetlands | Total |
| House Creek | 232 | 2,345 | 248 | 25 | 0 | 202 | 26,086 | 8,316 | 5,661 | 5,672 | 3,270 | 494 | 52,550 |
| | (0.4) | (4.5) | (0.5) | (0.0) | (0.0) | (0.4) | (49.6) | (15.8) | (10.8) | (10.8) | (6.2) | (0.9) | (100.0) |
| Intrenchment Creek | 13 | 1,719 | 2,227 | 2,130 | 26 | 0 | 941 | 0 | 117 | 46 | 21 | 0 | 7,241 |
| | (0.2) | (23.7) | (30.8) | (29.4) | (0.4) | (0.0) | (13.0) | (0.0) | (1.6) | (0.6) | (0.3) | (0.0) | (100.0) |
| Jacks Creek | 6 | 911 | 947 | 133 | 2 | 0 | 808 | 0 | 129 | 19 | 14 | 0 | 2,969 |
| | (0.2) | (30.7) | (31.9) | (4.5) | (0.1) | (0.0) | (27.2) | (0.0) | (4.3) | (0.6) | (0.5) | (0.0) | (100.0) |
| Jackson Creek | 77 | 4,182 | 3,509 | 1,755 | 69 | 0 | 3,451 | 0 | 309 | 90 | 324 | 0 | 13,765 |
| | (0.6) | (30.4) | (25.5) | (12.7) | (0.5) | (0.0) | (25.1) | (0.0) | (2.2) | (0.7) | (2.4) | (0.0) | (100.0) |
| Little Haynes Creek | 133 | 1,444 | 823 | 200 | 211 | 107 | 8,472 | 10 | 3,775 | 1,400 | 425 | 0 | 16,999 |
| | (0.8) | (8.5) | (4.8) | (1.2) | (1.2) | (0.6) | (49.8) | (0.1) | (22.2) | (8.2) | (2.5) | (0.0) | (100.0) |
| Little Stone Mountain Creek | 2 | 602 | 236 | 12 | 6 | 0 | 725 | 0 | 19 | 24 | 9 | 0 | 1,635 |
| | (0.1) | (36.8) | (14.4) | (0.7) | (0.4) | (0.0) | (44.3) | (0.0) | (1.2) | (1.5) | (0.6) | (0.0) | (100.0) |
| Little Suwannee Creek | 106 | 1,525 | 2,046 | 526 | 33 | 1 | 2,096 | 0 | 352 | 83 | 167 | 0 | 6,934 |
| | (1.5) | (22.0) | (29.5) | (7.6) | (0.5) | (0.0) | (30.2) | (0.0) | (5.1) | (1.2) | (2.4) | (0.0) | (100.0) |
| McClain Branch | 15 | 622 | 393 | 24 | 9 | 0 | 1,148 | 0 | 184 | 115 | 113 | 0 | 2,622 |
| | (0.6) | (23.7) | (15.0) | (0.9) | (0.3) | (0.0) | (43.8) | (0.0) | (7.0) | (4.4) | (4.3) | (0.0) | (100.0) |
| Mosquito Creek | 178 | 1,200 | 302 | 10 | 0 | 27 | 13,092 | 7,182 | 2,215 | 3,385 | 2,852 | 382 | 30,826 |
| | (0.6) | (3.9) | (1.0) | (0.0) | (0.0) | (0.1) | (42.5) | (23.3) | (7.2) | (11.0) | (9.3) | (1.2) | (100.0) |
| No Business Creek | 52 | 1,491 | 1,232 | 450 | 103 | 0 | 2,371 | 0 | 370 | 69 | 40 | 0 | 6,178 |
| | (0.8) | (24.1) | (19.9) | (7.3) | (1.7) | (0.0) | (38.4) | (0.0) | (6.0) | (1.1) | (0.6) | (0.0) | (100.0) |
| North Branch South River | 8 | 709 | 1,442 | 1,215 | 0 | 0 | 260 | 0 | 19 | 9 | 4 | 0 | 3,666 |
| | (0.2) | (19.3) | (39.3) | (33.1) | (0.0) | (0.0) | (7.1) | (0.0) | (0.5) | (0.2) | (0.1) | (0.0) | (100.0) |
| Ocmulgee River | 17,672 | 77,944 | 31,339 | 15,149 | 4,835 | 4,970 | 731,014 | 24,254 | 130,545 | 95,970 | 92,759 | 4,332 | 1,230,784 |
| | (1.4) | (6.3) | (2.5) | (1.2) | (0.4) | (0.4) | (59.4) | (2.0) | (10.6) | (7.8) | (7.5) | (0.4) | (100.0) |
| Pew Creek | 4 | 1,114 | 1,368 | 861 | 59 | 0 | 987 | 0 | 89 | 51 | 14 | 0 | 4,546 |
| | (0.1) | (24.5) | (30.1) | (18.9) | (1.3) | (0.0) | (21.7) | (0.0) | (2.0) | (1.1) | (0.3) | (0.0) | (100.0) |
| Rocky Creek | 493 | 6,460 | 4,256 | 2,013 | 166 | 59 | 12,710 | 93 | 2,129 | 1,375 | 1,938 | 82 | 31,774 |
| | (1.6) | (20.3) | (13.4) | (6.3) | (0.5) | (0.2) | (40.0) | (0.3) | (6.7) | (4.3) | (6.1) | (0.3) | (100.0) |

| Stream/Segment | Landuse Categories - Acres (Percent) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Open Water | Low Intensity Residential | High Intensity Residential | High Intensity Commercial, Industrial, Transportation | Bare Rock, Sand, Clay | Quarries, Strip Mines, Gravel Pits | Forest | Row Crops | Pasture, Hay | Other Grasses (Urban, recreational; e.g. parks, lawns) | Woody Wetlands | Emergent Herbaceous Wetlands | Total |
| Rum Creek | 18 | 226 | 28 | 12 | 12 | 0 | 2,754 | 0 | 455 | 323 | 102 | 0 | 3,929 |
| | (0.5) | (5.8) | (0.7) | (0.3) | (0.3) | (0.0) | (70.1) | (0.0) | (11.6) | (8.2) | (2.6) | (0.0) | (100.0) |
| Shetley Creek | 7 | 208 | 290 | 123 | 0 | 26 | 132 | 0 | 5 | 8 | 1 | 0 | 800 |
| | (0.9) | (26.0) | (36.3) | (15.4) | (0.0) | (3.3) | (16.5) | (0.0) | (0.6) | (1.0) | (0.1) | (0.0) | (100.0) |
| Shoal Creek Headwaters to South River | 9 | 2,026 | 1,413 | 588 | 2 | 0 | 1,194 | 0 | 43 | 10 | 38 | 0 | 5,324 |
| | (0.2) | (38.1) | (26.5) | (11.0) | (0.0) | (0.0) | (22.4) | (0.0) | (0.8) | (0.2) | (0.7) | (0.0) | (100.0) |
| Shoal Creek Headwaters to Alcovy River | 34 | 896 | 1,372 | 419 | 134 | 0 | 1,517 | 0 | 491 | 284 | 47 | 0 | 5,194 |
| | (0.7) | (17.3) | (26.4) | (8.1) | (2.6) | (0.0) | (29.2) | (0.0) | (9.5) | (5.5) | (0.9) | (0.0) | (100.0) |
| Snapfinger Creek | 127 | 8,320 | 6,436 | 2,844 | 77 | 2 | 6,181 | 0 | 285 | 149 | 201 | 0 | 24,622 |
| | (0.5) | (33.8) | (26.1) | (11.6) | (0.3) | (0.0) | (25.1) | (0.0) | (1.2) | (0.6) | (0.8) | (0.0) | (100.0) |
| Snapping Shoals Creek | 201 | 3,653 | 3,541 | 1,790 | 180 | 83 | 10,214 | 10 | 3,750 | 1,155 | 634 | 0 | 25,210 |
| | (0.8) | (14.5) | (14.0) | (7.1) | (0.7) | (0.3) | (40.5) | (0.0) | (14.9) | (4.6) | (2.5) | (0.0) | (100.0) |
| South River Atlanta to Flakes Mill Road | 202 | 17,248 | 17,515 | 11,098 | 256 | 0 | 15,931 | 2 | 1,127 | 884 | 846 | 0 | 65,108 |
| | (0.3) | (26.5) | (26.9) | (17.0) | (0.4) | (0.0) | (24.5) | (0.0) | (1.7) | (1.4) | (1.3) | (0.0) | (100.0) |
| South River Flakes Mill Road to Pole Bridge Ck | 539 | 30,840 | 27,921 | 15,273 | 506 | 92 | 35,134 | 5 | 2,989 | 1,935 | 1,633 | 0 | 116,867 |
| | (0.5) | (26.4) | (23.9) | (13.1) | (0.4) | (0.1) | (30.1) | (0.0) | (2.6) | (1.7) | (1.4) | (0.0) | (100.0) |
| South River Pole Bridge Creek to Hwy 20 | 933 | 35,753 | 30,359 | 15,683 | 634 | 527 | 59,456 | 22 | 8,781 | 4,350 | 2,731 | 0 | 159,229 |
| | (0.6) | (22.5) | (19.1) | (9.8) | (0.4) | (0.3) | (37.3) | (0.0) | (5.5) | (2.7) | (1.7) | (0.0) | (100.0) |
| South River Hwy 20 to Snapping Shoals Creek | 3,594 | 55,126 | 46,810 | 21,418 | 1,647 | 958 | 118,789 | 70 | 32,058 | 10,529 | 7,529 | 1 | 29,8529 |
| | (1.2) | (18.5) | (15.7) | (7.2) | (0.6) | (0.3) | (39.8) | (0.0) | (10.7) | (3.5) | (2.5) | (0.0) | (100.0) |
| South River Snapping Shoals to Jackson Lake | 3,940 | 60,105 | 50,527 | 23,220 | 2,163 | 1,041 | 142,150 | 97 | 40,382 | 14,215 | 8,862 | 2 | 346,704 |
| | (1.1) | (17.3) | (14.6) | (6.7) | (0.6) | (0.3) | (41.0) | (0.0) | (11.6) | (4.1) | (2.6) | (0.0) | (100.0) |
| Stone Mountain Creek | 7 | 851 | 398 | 415 | 0 | 0 | 902 | 0 | 23 | 23 | 18 | 0 | 2,638 |
| | (0.3) | (32.3) | (15.1) | (15.7) | (0.0) | (0.0) | (34.2) | (0.0) | (0.9) | (0.9) | (0.7) | (0.0) | (100.0) |
| Sugar Creek U/S Memorial Drive to South River | 4 | 1,813 | 1,761 | 741 | 5 | 0 | 1,200 | 0 | 81 | 20 | 49 | 0 | 5,673 |
| | (0.1) | (32.0) | (31.0) | (13.1) | (0.1) | (0.0) | (21.2) | (0.0) | (1.4) | (0.4) | (0.9) | (0.0) | (100.0) |
| Sugar Creek Turnpike Creek to Little Ocmulgee River | 626 | 5,848 | 1,397 | 421 | 0 | 68 | 66,251 | 10,519 | 7,775 | 10,611 | 12,366 | 679 | 116,562 |
| | (0.5) | (5.0) | (1.2) | (0.4) | (0.0) | (0.1) | (56.8) | (9.0) | (6.7) | (9.1) | (10.6) | (0.6) | (100.0) |

| Stream/Segment | Landuse Categories - Acres (Percent) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Open Water | Low Intensity Residential | High Intensity Residential | High Intensity Commercial, Industrial, Transportation | Bare Rock, Sand, Clay | Quarries, Strip Mines, Gravel Pits | Forest | Row Crops | Pasture, Hay | Other Grasses (Urban, recreational; e.g. parks, lawns) | Woody Wetlands | Emergent Herbaceous Wetlands | Total |
| Sweetwater Creek | 345 | 6,557 | 8,541 | 7,287 | 177 | 646 | 5,588 | 14 | 1,053 | 392 | 827 | 2 | 31,431 |
| | (1.1) | (20.9) | (27.2) | (23.2) | (0.6) | (2.1) | (17.8) | (0.0) | (3.4) | (1.2) | (2.6) | (0.0) | (100.0) |
| Swift Creek | 116 | 460 | 581 | 166 | 16 | 539 | 2,230 | 9 | 410 | 247 | 115 | 0 | 4,889 |
| | (2.4) | (9.4) | (11.9) | (3.4) | (0.3) | (11.0) | (45.6) | (0.2) | (8.4) | (5.1) | (2.4) | (0.0) | (100.0) |
| Tobesofkee Creek Barnesville to Cole Creek | 46 | 633 | 363 | 157 | 35 | 45 | 6,276 | 25 | 3,059 | 922 | 268 | 0 | 11,827 |
| | (0.4) | (5.4) | (3.1) | (1.3) | (0.3) | (0.4) | (53.1) | (0.2) | (25.9) | (7.8) | (2.3) | (0.0) | (100.0) |
| Tobesofkee Creek Cole Creek to Todd Creek | 213 | 1,071 | 400 | 160 | 77 | 306 | 16,237 | 29 | 5,488 | 2,224 | 755 | 0 | 26,962 |
| | (0.8) | (4.0) | (1.5) | (0.6) | (0.3) | (1.1) | (60.2) | (0.1) | (20.4) | (8.2) | (2.8) | (0.0) | (100.0) |
| Lake Tobesofkee to Rocky Creek | 91 | 2,961 | 1,679 | 533 | 85 | 37 | 7,247 | 748 | 2,098 | 1,118 | 3,175 | 154 | 19,927 |
| | (0.5) | (14.9) | (8.4) | (2.7) | (0.4) | (0.2) | (36.4) | (3.8) | (10.5) | (5.6) | (15.9) | (0.8) | (100.0) |
| Towaliga River | 2,129 | 6,199 | 3,187 | 1,090 | 529 | 264 | 49,897 | 116 | 21,920 | 6,032 | 3,716 | 12 | 95,091 |
| | (2.2) | (6.5) | (3.4) | (1.1) | (0.6) | (0.3) | (52.5) | (0.1) | (23.1) | (6.3) | (3.9) | (0.0) | (100.0) |
| Town Branch | 11 | 296 | 158 | 77 | 23 | 0 | 1,202 | 0 | 194 | 86 | 59 | 0 | 2,108 |
| | (0.5) | (14.0) | (7.5) | (3.7) | (1.1) | (0.0) | (57.0) | (0.0) | (9.2) | (4.1) | (2.8) | (0.0) | (100.0) |
| Turkey Creek | 7 | 463 | 576 | 125 | 4 | 0 | 463 | 0 | 33 | 6 | 16 | 0 | 1,692 |
| | (0.4) | (27.4) | (34.0) | (7.4) | (0.2) | (0.0) | (27.4) | (0.0) | (2.0) | (0.4) | (0.9) | (0.0) | (100.0) |
| Turnpike Creek | 237 | 1,980 | 157 | 26 | 0 | 37 | 29,102 | 5,421 | 3,816 | 5,035 | 5,267 | 309 | 51,386 |
| | (0.5) | (3.9) | (0.3) | (0.1) | (0.0) | (0.1) | (56.6) | (10.5) | (7.4) | (9.8) | (10.2) | (0.6) | (100.0) |
| Tussahaw Creek | 288 | 2,280 | 840 | 322 | 270 | 30 | 25,306 | 81 | 11,663 | 3,582 | 1,923 | 0 | 46,584 |
| | (0.6) | (4.9) | (1.8) | (0.7) | (0.6) | (0.1) | (54.3) | (0.2) | (25.0) | (7.7) | (4.1) | (0.0) | (100.0) |
| Walnut Creek | 595 | 4,428 | 1,302 | 491 | 474 | 406 | 37,309 | 90 | 6,240 | 6,225 | 1,884 | 84 | 59,528 |
| | (1.0) | (7.4) | (2.2) | (0.8) | (0.8) | (0.7) | (62.7) | (0.2) | (10.5) | (10.5) | (3.2) | (0.1) | (100.0) |
| Watson Creek | 4 | 800 | 517 | 180 | 1 | 0 | 737 | 0 | 70 | 11 | 4 | 0 | 2,323 |
| | (0.2) | (34.4) | (22.3) | (7.7) | (0.0) | (0.0) | (31.7) | (0.0) | (3.0) | (0.5) | (0.2) | (0.0) | (100.0) |
| Wise Creek | 46 | 414 | 26 | 2 | 18 | 0 | 8,744 | 1 | 888 | 738 | 319 | 0 | 11,196 |
| | (0.4) | (3.7) | (0.2) | (0.0) | (0.2) | (0.0) | (78.1) | (0.0) | (7.9) | (6.6) | (2.8) | (0.0) | (100.0) |
| Yellow River Headwaters to Harris Lake | 7 | 951 | 1,279 | 178 | 8 | 0 | 1,367 | 0 | 221 | 32 | 26 | | 4,069 |
| | (0.2) | (23.4) | (31.4) | (4.4) | (0.2) | (0.0) | (33.6) | (0.0) | (5.4) | (0.8) | (0.6) | (0.0) | (100.0) |

| Stream/Segment | Landuse Categories - Acres (Percent) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Open Water | Low Intensity Residential | High Intensity Residential | High Intensity Commercial, Industrial, Transportation | Bare Rock, Sand, Clay | Quarries, Strip Mines, Gravel Pits | Forest | Row Crops | Pasture, Hay | Other Grasses (Urban, recreational; e.g. parks, lawns) | Woody Wetlands | Emergent Herbaceous Wetlands | Total |
| Yellow River Harris Lake to Pew Creek | 180 | 3,421 | 5,233 | 1,635 | 121 | 38 | 4,271 | 0 | 562 | 198 | 236 | | 15,895 |
| | (1.1) | (21.5) | (32.9) | (10.3) | (0.8) | (0.2) | (26.9) | (0.0) | (3.5) | (1.2) | (1.5) | (0.0) | (100.0) |
| Yellow River Sweetwater Creek to Centerville Creek | 866 | 26,304 | 28,375 | 14,293 | 671 | 688 | 26,094 | 14 | 3,475 | 1,095 | 1,768 | 2 | 103,645 |
| | (0.8) | (25.4) | (27.4) | (13.8) | (0.6) | (0.7) | (25.2) | (0.0) | (3.4) | (1.1) | (1.7) | (0.0) | (100.0) |
| Yellow River Centerville Creek to Hammock Creek | 2,121 | 34,812 | 34,617 | 16,190 | 981 | 1,811 | 45,323 | 26 | 6,008 | 2,433 | 2,446 | 2 | 146,770 |
| | (1.4) | (23.7) | (23.6) | (11.0) | (0.7) | (1.2) | (30.9) | (0.0) | (4.1) | (1.7) | (1.7) | (0.0) | (100.0) |
| Yellow River Hammock Creek to Big Haynes Creek | 2,289 | 37,123 | 36,677 | 17,310 | 1,116 | 1,811 | 55,359 | 34 | 7,944 | 3,518 | 2,949 | 2 | 166,132 |
| | (1.4) | (22.3) | (22.1) | (10.4) | (0.7) | (1.1) | (33.3) | (0.0) | (4.8) | (2.1) | (1.8) | (0.0) | (100.0) |
| Yellow River Big Haynes Creek to Jackson Lake | 4,263 | 49,670 | 45,473 | 19,374 | 2,588 | 2,099 | 114,168 | 119 | 31,621 | 13,002 | 6,648 | 7 | 289,032 |
| | (1.5) | (17.2) | (15.7) | (6.7) | (0.9) | (0.7) | (39.5) | (0.0) | (10.9) | (4.5) | (2.3) | (0.0) | (100.0) |

## 2.0 WATER QUALITY ASSESSMENT

Stream segments are placed on the 303(d) list as partially supporting or not supporting their water use classification based on water quality sampling data. A stream is placed on the partial support list if more than 10% of the samples exceed the fecal coliform criteria and on the not support list if more than 25% of the samples exceed the standard. Water quality samples collected within a 30-day period that have a geometric mean in excess of 200 counts per 100 milliliters during the period May through October, or in excess of 1000 counts per 100 milliliters during the period November through April, are in violation of the bacteria water quality standard. There is also a single sample maximum criterion (4000 counts per 100 milliliters) for the months of November through April.

Fecal coliform data were collected during calendar years 1999 and 2004. Sources of these data include the following:

- United States Geological Survey (USGS) basin water quality data, 1999 and 2004;
- Georgia Environmental Protection Division (GA EPD) Trend Monitoring data, 2004; and
- Gwinnett County data, 2001-2005.

These sources contained enough information to calculate a 30-day geometric mean. The data used for these TMDLs are presented in Appendix A.

# 3.0 SOURCE ASSESSMENT

An important part of the TMDL analysis is the identification of potential source categories. Sources are broadly classified as either point or nonpoint sources. A point source is defined as a discernable, confined, and discrete conveyance from which pollutants are or may be discharged to surface waters. Nonpoint sources are diffuse, and generally, but not always, involve accumulation of fecal coliform bacteria on land surfaces that wash off as a result of storm events.

## 3.1 Point Source Assessment

Title IV of the Clean Water Act establishes the National Pollutant Discharge Elimination System (NPDES) permit program. Basically, there are two categories of NPDES permits: 1) municipal and industrial wastewater treatment facilities, and 2) regulated storm water discharges.

### 3.1.1 Wastewater Treatment Facilities

In general, industrial and municipal wastewater treatment facilities have NPDES permits with effluent limits. These permit limits are either based on federal and state effluent guidelines (technology-based limits) or on water quality standards (water quality-based limits).

The EPA has developed technology-based guidelines, which establish a minimum standard of pollution control for municipal and industrial discharges without regard for the quality of the receiving waters. These are based on Best Practical Control Technology Currently Available (BPT), Best Conventional Control Technology (BCT), and Best Available Technology Economically Achievable (BAT). The level of control required by each facility depends on the type of discharge and the pollutant.

The EPA and the states have also developed numeric and narrative water quality standards. Typically, these standards are based on the results of aquatic toxicity tests and/or human health criteria and include a margin of safety. Water quality-based effluent limits are set to protect the receiving stream. These limits are based on water quality standards that have been established for a stream based on its intended use and the prescribed biological and chemical conditions that must be met to sustain that use.

Municipal and industrial wastewater treatment facilities' discharges may contribute fecal coliform to receiving waters. There are 52 NPDES permitted discharges with flows greater than 0.1 MGD identified in the Ocmulgee River Basin that discharge treated municipal wastewater. Table 4 provides the monthly average discharge flows and fecal coliform concentrations for the municipal and industrial treatment facilities, obtained from calendar year 2003 Discharge Monitoring Report (DMR) data. The permitted flow and fecal coliform concentrations for these facilities are also included in this table.

Combined sewer systems convey a mixture of raw sewage and storm water in the same conveyance structure to the wastewater treatment plant. These are considered a component of municipal wastewater treatment facilities. When the combined sewage exceeds the capacity of the wastewater treatment plant, the excess is diverted to a combined sewage overflow (CSO) discharge point. There are two permitted CSO outfalls in the Ocmulgee River Basin, and these are given in Table 5.

## Table 4. NPDES Facilities Discharging Fecal Coliform in the Ocmulgee River Basin

| Facility Name | NPDES Permit No. | Receiving Stream | Actual 2003 Discharge | | NPDES Permit Limits | | Number of Violations Jan 2001 - Jan 2005 |
|---|---|---|---|---|---|---|---|
| | | | Average Monthly Flow (MGD)[1] | Geometric Mean (No./100 mL)[2] | Average Monthly Flow (MGD) | Average Monthly FC (No./100mL) | |
| Abbeville | GA0047643 | Ocmulgee River | 0.14 | 1241.4 | 0.28 | 200 | 11 |
| Alamo | GA0037753 | Alligator Cr | 0.17 | 780.7 | 0.375 | 200 | 11 |
| Barnesville Gordon Rd | GA0021041 | Tobesofkee Cr | 0.86 | 33.3 | 1.2 | 200 | |
| Byron Pond (2005 Data) | GA0026794 | Echeconnee Cr | 3.58 | 8578.3 | 0.44 | 200 | 12 |
| Clayton Co Northeast | GA0020575 | Panther Cr | 3.01 | 1.6 | 6 | 200 | |
| Cochran WPCP | GA0032107 | Jordan Cr | 0.76 | 29.7 | 0.6 | 200 | |
| DeKalb Co Polebridge Cr | GA0026816 | South River | 12.05 | 3.0 | 20 | 200 | |
| DeKalb Co Snapfinger Cr | GA0024147 | South River | 27.19 | 4.8 | 36 | 200 | |
| Eastman Roach Branch | GA0026310 | Roach Br To Gum Swamp Cr | 0.60 | 33.4 | 0.9 | 200 | |
| Eastman South WPCP | GA0046485 | Sugar Cr Trib | 0.48 | 20.5 | 0.9 | 200 | |
| Forsyth Northeast | GA0031801 | Town Cr To Rum Cr | 8.41 | 8.4 | 1.4 | 200 | |
| Forsyth South | GA0024732 | Slippery Rock Cr Trib | 0.25 | 3.4 | 0.6 | 200 | |
| Fort Valley WPCP | GA0031046 | Bay Cr To Indian Cr Trib | 1.10 | 75.6 | 2.2 | 200 | |
| Griffin Cabin Creek | GA0020214 | Cabin Cr | 0.83 | 2.0 | 1.5 | 200 | |
| Gwinnett Co Beaver Ruin/Sweetwater Creek | GA0032841 | Sweetwater Cr Trib | 3.16 | 2.3 | 4.5 | 200 | |
| Gwinnett Co Jacks Cr | GA0047627 | Yellow River To Ocmulgee | 0.51 | 1.3 | 1 | 200 | |
| Gwinnett Co Jackson Creek | GA0030732 | Jackson Cr Trib | 2.63 | 1.0 | 3 | 200 | |
| Gwinnett Co No Business | GA0023973 | No Business Cr | 0.92 | 1.0 | 1 | 200 | |

| Facility Name | NPDES Permit No. | Receiving Stream | Actual 2003 Discharge | | NPDES Permit Limits | | Number of Violations Jan 2001 - Jan 2005 |
|---|---|---|---|---|---|---|---|
| | | | Average Monthly Flow (MGD)[1] | Geometric Mean (No./100 mL)[2] | Average Monthly Flow (MGD) | Average Monthly FC (No./100mL) | |
| Gwinnett Co Yellow River | GA0047911 | Yellow River Trib | 8.44 | 1.8 | 12.5 | 25 | |
| Hawkinsville North | GA0046027 | Ocmulgee River | 0.43 | 53.0 | 1 | 200 | |
| Hawkinsville South | GA0020338 | Ocmulgee River | 0.38 | 17.8 | 1.3 | 200 | |
| Hazlehurst Bully Creek | GA0036765 | Ocmulgee River | 0.82 | 39.8 | 1.5 | 200 | |
| Helena WPCP | GA0048674 | Ocmulgee River Trib | 0.44 | NM | 0.3 | NL | |
| Henry Co Springdale | GA0037214 | Big Cotton Indian Cr | 0.49 | 8.6 | 0.5 | 200 | |
| Henry Co Springdale-Walnut | GA0037869 | Walnut Cr To South River | 0.43 | 6.8 | 0.4 | 200 | |
| Jackson Northeast | GA0032719 | Yellow Water Cr Trib | 0.12 | 55.1 | 0.14 | 200 | |
| Jackson Southside | GA0023931 | Town Branch Trib | 0.13 | 2.0 | 0.7 | 200 | |
| Jackson Yellow Water Cr | GA0021831 | Yellow Water Cr Trib | 0.24 | 2.0 | 0.75 | 200 | |
| Lakeview Utilities Inc | GA0035491 | Yellow River | 0.06 | 50.8 | 0.158 | 200 | 1 |
| Locust Grove Indian Creek | GA0038571 | Indian Creek Tributary | TBA | TBA! | 1.5 | 200 | |
| Locust Grove Skyland MHP | GA0049816 | Wolf Creek Tributary | 0.17 | 73.3 | 0.2 | 200 | |
| Loganville WPCP | GA0020788 | Big Flat Cr Trib | 0.81 | 13.4 | 1.75 | 200 | |
| Lumber City Pond | GA0050199 | Ocmulgee River | 0.26 | NM | 0.22 | NL | |
| Macon Poplar St | GA0024538 | Ocmulgee River | 15.43 | 6.4 | 20 | 200 | |
| Macon Rocky Cr | GA0024546 | Ocmulgee River | 20.74 | 11.6 | 24 | 200 | |
| McDonough Walnut Cr | GA0023949 | Walnut Cr | 0.97 | 38.8 | 2 | 200 | |
| McRae Gum Swamp | GA0026298 | Gum Swamp Cr | 13.68 | 40.2 | 0.2 | 200 | |
| Perdue Farms | GA0002844 | Big Indian Creek Tributary | 1.46 | 111.9 | 4 | 200 | |

| Facility Name | NPDES Permit No. | Receiving Stream | Actual 2003 Discharge | | NPDES Permit Limits | | Number of Violations Jan 2001 - Jan 2005 |
|---|---|---|---|---|---|---|---|
| | | | Average Monthly Flow (MGD)[1] | Geometric Mean (No./100 mL)[2] | Average Monthly Flow (MGD) | Average Monthly FC (No./100mL) | |
| Perry WPCP | GA0021334 | Big Indian Creek | 2.49 | 39.3 | 3 | 200 | |
| Pinehurst (2005 Data) | GA0038075 | South Prong Creek | 0.04 | 2104.6 | 0.12 | 200 | 12 |
| Rockdale Co Almand Branch | GA0021610 | Almand Br Trib/ South River | 0.73 | 5.8 | 1.25 | 200 | |
| Rockdale Co Honey Creek | GA0022659 | Honey Creek | 0.19 | 11.5 | 0.3 | 200 | |
| Rockdale Co Quigg Branch | GA0047678 | Yellow River | 3.62 | 4.1 | 3 | 200 | |
| Rockdale Co Scott Creek | GA0026239 | Scott Creek | 0.16 | 5.9 | 0.22 | 200 | |
| Rockdale Co Snapping Shoals | GA0023035 | Snapping Shoals Creek | 0.23 | 5.3 | 0.45 | 200 | |
| Scotland Pond | GA0032344 | Little Ocmulgee River | 0.01 | 7943.3 | 0.18 | 200 | |
| South Hampton MHP | GA0025305 | Trib To Thompson Creek | 0.03 | 2.6 | 0.1 | 30 | |
| Springs Industries, Inc Griffin | GA0003409 | Cabin Creek | 1.10 | 6.3 | 1 | 400 | |
| Stockbridge WPCP | GA0023337 | Bush Creek Trib | 0.58 | 12.0 | 1.5 | 200 | |
| USAF Robins AFB | GA0002852 | Horse Creek Trib | 1.91 | 34.7 | 2.1 | 200 | |
| Warner Robins Ocmulgee River | GA0037796 | Ocmulgee River | 1.34 | 3.3 | 3 | 200 | |
| Warner Robins Sandy Run | GA0030325 | Sandy Run Creek | 6.40 | 11.3 | 9 | 200 | |

Source: GA EPD Regional Offices

Notes: [1] Values shown are the annual average of the monthly average flows.
[2] Values shown are the annual average of the monthly geometric means.
NL = No permit limit
NM = Not measured
TBA = To be added for final draft

**Table 5. Permitted Combined Sewer Overflows (CSOs) in the Ocmulgee River Basin**

| Municipality/County | Permit No. | Facility Name | Receiving Stream |
|---|---|---|---|
| City of Atlanta | GA0037168 | Custer Ave/Intrenchment | Intrenchment Creek |
| City of Atlanta | GA0037168 | McDaniel | South RiverTributary |

Source: Permitting and Compliance Program, Environmental Protection Division, GA EPD, 2006

### 3.1.2 Regulated Storm Water Discharges

Some storm water runoff is covered under the NPDES Permit Program. It is considered a diffuse source of pollution. Unlike other NPDES permits that establish end-of-pipe limits, storm water NPDES permits establish controls "to the maximum extent practicable" (MEP). Currently, regulated storm water discharges that may contain fecal coliform bacteria consist of those associated with industrial activities including construction sites disturbing one acre or greater, and large, medium, and small municipal separate storm sewer systems (MS4s) that serve populations of 50,000 or more.

Storm water discharges associated with industrial activities are currently covered under a General Storm Water NPDES Permit. This permit requires visual monitoring of storm water discharges, site inspections, implementation of Best Management Practices (BMPs), and record keeping.

Storm water discharges from MS4s are very diverse in pollutant loadings and frequency of discharge. At present, all cities and counties within the state of Georgia that had a population of greater than 100,000 at the time of the 1990 Census, are permitted for their storm water discharge under Phase I. This includes 60 permittees in Georgia, with about 45 located in the greater Atlanta metro area.

Phase I MS4 permits require the prohibition of non-storm water discharges (i.e., illicit discharges) into the storm sewer systems and controls to reduce the discharge of pollutants to the maximum extent practicable, including the use of management practices, control techniques and systems, as well as design and engineering methods (Federal Register, 1990). A site-specific Storm Water Management Plan (SWMP) outlining appropriate controls is required by and referenced in the permit. There are twenty- eight Phase I MS4s in the Ocmulgee River Basin (Table 6).

**Table 6. Phase I Permitted MS4s in the Ocmulgee River Basin**

| Name | Permit No. | Watershed |
|---|---|---|
| Atlanta | GAS000100 | Ocmulgee, Flint, Chattahoochee |
| Avondale Estates | GAS000137 | Ocmulgee, Chattahoochee |
| Bibb County | GAS000204 | Ocmulgee |
| Clarkston | GAS000106 | Ocmulgee, Chattahoochee |
| Clayton County | GAS000107 | Ocmulgee, Flint |
| Dacula | GAS000139 | Ocmulgee, Oconee |
| Decatur | GAS000110 | Ocmulgee, Chattahoochee |
| DeKalb County | GAS000111 | Ocmulgee, Chattahoochee |
| Duluth | GAS000112 | Ocmulgee, Chattahoochee |
| East Point | GAS000114 | Ocmulgee, Flint, Chattahoochee |
| Forest Park | GAS000116 | Ocmulgee, Flint, Chattahoochee |
| Fulton County | GAS000117 | Ocmulgee, Flint, Chattahoochee, Coosa |
| Grayson | GAS000140 | Ocmulgee |
| Gwinnett County | GAS000118 | Ocmulgee, Oconee, Chattahoochee |
| Hapeville | GAS000119 | Ocmulgee, Flint |
| Jonesboro | GAS000120 | Ocmulgee, Flint |
| Lake City | GAS000141 | Ocmulgee, Flint |
| Lawrenceville | GAS000122 | Ocmulgee |
| Lilburn | GAS000123 | Ocmulgee |
| Lithonia | GAS000124 | Ocmulgee |
| Lovejoy | GAS000142 | Ocmulgee, Flint |
| Macon | GAS000203 | Ocmulgee |
| Morrow | GAS000126 | Ocmulgee, Flint |
| Norcross | GAS000127 | Ocmulgee, Chattahoochee |
| Pine Lake | GAS000143 | Ocmulgee |
| Snellville | GAS000133 | Ocmulgee |
| Stone Mountain | GAS000134 | Ocmulgee |
| Suwannee | GAS000144 | Ocmulgee, Chattahoochee |

Source: Nonpoint Source Permitting Program, GA DNR, 2006

As of March 10, 2003, small MS4s serving urbanized areas are required to obtain a storm water permit under the Phase II storm water regulations. An urbanized area is defined as an entity with a residential population of at least 50,000 people and an overall population density of at least 1,000 people per square mile. Thirty counties and 56 communities are permitted under the Phase II regulations in Georgia. There are seventeen counties or communities located in the Ocmulgee River Basin that are covered by the Phase II General Storm Water Permit (Table 7).

**Table 7. Phase II Permitted MS4s in the Ocmulgee River Basin**

| Name | Watershed |
|---|---|
| Centerville | Ocmulgee |
| Conyers | Ocmulgee |
| Griffin | Ocmulgee, Flint |
| Hampton | Ocmulgee, Flint |
| Henry County | Ocmulgee, Flint |
| Houston County | Ocmulgee |
| Jones County | Ocmulgee |
| Lilburn | Ocmulgee |
| Loganville | Ocmulgee |
| McDonough | Ocmulgee |
| Newton County | Ocmulgee |
| Peach County | Ocmulgee |
| Rockdale County | Ocmulgee |
| Spalding County | Ocmulgee, Flint |
| Stockbridge | Ocmulgee |
| Walton County | Ocmulgee |
| Warner Robins | Ocmulgee |

Source: Nonpoint Source Permitting Program, GA DNR, 2006

Those watersheds that occur within Phase I or Phase II MS4 areas as are listed in Table 8. The table provides the total area of each of these watersheds, and the percentage of the watershed that is an MS4 area.

### 3.1.3 Confined Animal Feeding Operations

Confined livestock and confined animal feeding operations (CAFOs) are characterized by high animal densities. This results in large quantities of fecal material being contained in a limited area. Processed agricultural manure from confined hog, dairy cattle, and select poultry operations is generally collected in lagoons. It is then applied to pastureland and cropland as a fertilizer during the growing season, at rates that often vary monthly.

In 1990, the State of Georgia began registering CAFOs. Many of the CAFOs were issued land application or NPDES permits for treatment of wastewaters generated from their operations. The type of permit issued depends on the operation size (i.e., number of animal units). Table 9

## Table 8. Percentage of Watersheds Occurring in MS4 Areas

| Name | Total Area (acres) | % in MS4 area |
|---|---|---|
| Alcovy River Headwaters to Walton Co Line | 32,684.0 | 99.7 |
| Alcovy River Cedar Cr to Bay Cr | 38,783.0 | 92.4 |
| Alcovy River Mountain Cr to Big Flat Cr | 90,516.0 | 47.0 |
| Almand Branch | 10,366.0 | 100.0 |
| Bay Creek Headwaters to Alcovy River | 10,220.0 | 66.1 |
| Beaver Ruin Creek | 14,676.0 | 100.0 |
| Big Flat Creek | 18,850.0 | 14.8 |
| Big Haynes Creek Headwaters to Brushy Fork Cr | 12,564.0 | 100.0 |
| Big Haynes Creek Brushy Fork Cr to Little Panther Cr | 21,953.0 | 91.4 |
| Big Haynes Creek Little Haynes Cr to Yellow River | 52,658.0 | 47.1 |
| Big Indian Creek | 234,518.0 | 3.6 |
| Bromolow Creek | 7,518.0 | 100.0 |
| Brushy Fork Creek | 8,007.0 | 87.7 |
| Cabin Creek | 21,655.0 | 19.9 |
| Camp Creek | 4,797.0 | 100.0 |
| Cedar Creek | 2,627.0 | 100.0 |
| Cobbs Creek | 6,398.0 | 100.0 |
| Conley Creek | 9,857.0 | 100.0 |
| Doless Creek | 1,242.0 | 100.0 |
| Doolittle Creek | 4,776.0 | 100.0 |
| Honey Creek | 18,050.0 | 79.7 |
| Hopkins Creek | 2,969.0 | 100.0 |
| Intrenchment Creek | 7,241.0 | 100.0 |
| Jacks Creek | 2,969.0 | 100.0 |
| Jackson Creek | 13,765.0 | 100.0 |
| Little Haynes Creek | 16,999.0 | 24.3 |
| Little Stone Mountain Creek | 1,635.0 | 100.0 |
| Little Suwannee Creek | 6,934.0 | 100.0 |
| McClain Branch | 2,622.0 | 100.0 |
| No Business Creek | 6,178.0 | 100.0 |
| North Branch South River | 3,666.0 | 100.0 |
| Ocmulgee River | 1,230,784.0 | 17.5 |
| Pew Creek | 4,546.0 | 100.0 |
| Rocky Creek (Macon, Bibb County) | 31,774.0 | 81.0 |
| Shetley Creek | 800.0 | 100.0 |
| Shoal Creek Headwaters to South River | 5,324.0 | 100.0 |
| Shoal Creek Headwaters to Alcovy River | 5,194.0 | 100.0 |
| Snapfinger Creek | 24,622.0 | 100.0 |
| Snapping Shoals Creek | 25,210.0 | 31.0 |
| South River Atlanta to Flakes Mill Road | 65,108.0 | 100.0 |
| South River Flakes Mill Road to Pole Bridge Cr | 116,867.0 | 85.1 |

| Name | Total Area (acres) | % in MS4 area |
|---|---|---|
| South River Pole Bridge Cr to Hwy 20 | 159,229.0 | 83.9 |
| South River Hwy 20 to Snapping Shoals Cr | 298,529.0 | 72.6 |
| South River Snapping Shoals to Jackson Lake | 346,704.0 | 68.0 |
| Stone Mountain Cr | 2,638.0 | 100.0 |
| Sugar Creek U/S Memorial Drive to South River | 5,673.0 | 100.0 |
| Sweetwater Cr (Gwinnett County) | 31,431.0 | 100.0 |
| Swift Creek | 4,889.0 | 100.0 |
| Tobesofkee Creek Lake Tobesofkee to Rocky Cr | 19,927.0 | 100.0 |
| Towaliga River | 95,091.0 | 6.8 |
| Turkey Creek | 1,692.0 | 100.0 |
| Tussahaw Creek | 46,584.0 | 1.3 |
| Walnut Creek | 59,528.0 | 11.0 |
| Watson Creek | 2,323.0 | 100.0 |
| Yellow River Headwaters to Harris Lake | 4,069.0 | 100.0 |
| Yellow River Harris Lake to Pew Cr | 15,895.0 | 100.0 |
| Yellow River Sweetwater Cr to Centerville Cr | 103,645.0 | 100.0 |
| Yellow River Centerville Cr to Hammock Cr | 146,770.0 | 73.6 |
| Yellow River Hammock Cr to Big Haynes Cr | 166,132.0 | 71.2 |
| Yellow River Big Haynes Cr to Jackson Lake | 289,032.0 | 55.3 |

presents the swine and non-swine (primarily dairies) CAFOs located in the Ocmulgee River Basin that are registered or have land application permits.

**Table 9. Registered CAFOs in the Ocmulgee River Basin**

| Name | County | Animal Type | Total No. of Animals | Permit No. |
|---|---|---|---|---|
| Adamson Dairy Farm | Lamar | Dairy | 430 | GAU700000 |
| B & S Dairy | Wilcox | Dairy | 420 | GAU700000 |
| Bush Dairy Farm | Monroe | Dairy | - | GAU700000 |
| Haygood Farm | Upson | Dairy | 400 | GAU700000 |
| Ocmulgee Dairy, Inc. | Houston | Dairy | 360 | GAU700000 |
| Stoffell's Dairy Inc. | Peach | Dairy | 800 | GAG930000 |
| Walters Farm, LLP | Lamar | Swine | 7000 | GA0038181 |
| Wild Rose Dairy | Bibb | Dairy | 400 | GAU700000 |

Sources: Permitting Compliance and Enforcement Program, GA EPD, 2004
GA Dept. of Agriculture, 2006

## 3.2 Nonpoint Source Assessment

In general, nonpoint sources cannot be identified as entering a waterbody through a discrete conveyance at a single location. Typical nonpoint sources of fecal coliform bacteria include:

- Wildlife
- Agricultural Livestock
  - Animal grazing
  - Animal access to streams
  - Application of manure to pastureland and cropland
- Urban Development
  - Leaking sanitary sewer lines
  - Leaking septic systems
  - Land Application Systems
  - Landfills

In urban areas, a large portion of storm water runoff may be collected to storm sewer systems and discharged through distinct outlet structures. For large urban areas, these storm sewer discharge points may be regulated as described in Section 3.1.2.

### 3.2.1 Wildlife

The importance of wildlife as a source of fecal coliform bacteria in streams varies considerably, depending on the animal species present in the subwatersheds. Based on information provided by the Wildlife Resources Division (WRD) of GA DNR, the animals that spend a large portion of their time in or around aquatic habitats are the most important wildlife sources of fecal coliform. Waterfowl, most notably ducks and geese, are considered to potentially be the greatest contributors of fecal coliform. This is because they are typically found on the water surface, often in large numbers, and deposit their feces directly into the water. Other potentially important animals regularly found around aquatic environments include racoons, beavers, muskrats, and to a lesser extent, river otters and minks. Population estimates of these animal species in Georgia are currently not available.

White-tailed deer have a significant presence throughout the Ocmulgee River Basin. The average deer population for years 1995 through 2004 for counties in the Ocmulgee River Basin are presented in Table 10.

Fecal coliform bacteria contributions from deer to water bodies are generally considered less significant than that of waterfowl, racoons, and beavers. This is because a greater portion of their time is spent in terrestrial habitats. This also holds true for other terrestrial mammals such as squirrels and rabbits, and terrestrial birds (GA WRD, 2002). However, feces deposited on the land surface can result in the introduction of fecal coliform to streams during runoff events. It should be noted that between storm events, considerable decomposition of the fecal matter might occur, resulting in a decrease in the associated fecal coliform numbers. This is especially true in the warm, humid environments typical of the southeast.

### 3.2.2 Agricultural Livestock

Agricultural livestock are a potential source of fecal coliform to streams in the Ocmulgee River Basin. The animals grazing on pastureland deposit their feces onto land surfaces, where it can be transported during storm events to nearby streams. Animal access to pastureland varies

**Table 10. Deer Census Data in the Ocmulgee River Basin**

| County | 1995-2004 Average Population (Number/Sq Mi) |
|---|---|
| Ben Hill | 35 |
| Bibb | 50 |
| Bleckley | 35 |
| Butts | 50 |
| Clayton | 35 |
| Coffee | 35 |
| Crawford | 50 |
| De Kalb | 35 |
| Dodge | 35 |
| Dooly | 30 |
| Fulton | 35 |
| Gwinnett | 35 |
| Henry | 50 |
| Houston | 40 |
| Jasper | 50 |
| Jeff Davis | 35 |
| Jones | 50 |
| Lamar | 50 |
| Laurens | 35 |
| Macon | 30 |
| Monroe | 50 |
| Newton | 50 |
| Peach | 40 |
| Pulaski | 35 |
| Rockdale | 35 |
| Spaulding | 50 |
| Telfair | 35 |
| Twiggs | 40 |
| Upson | 50 |
| Walton | 35 |
| Wheeler | 35 |
| Wilcox | 35 |

Source: Wildlife Resources Division, GA DNR, 2004

monthly, resulting in varying fecal coliform loading rates throughout the year. Beef cattle spend all of their time in pastures, while dairy cattle and hogs are periodically confined. In addition,

agricultural livestock will often have direct access to streams that pass through their pastures, and can thus impact water quality in a more direct manner (USDA, 2002).

Table 11 provides the estimated number of beef cattle, dairy cattle, goats, horse, swine, sheep, and chickens by category reported by county. These data were provided by the Natural Resources Conservation Service (NRCS).

### 3.2.3 Urban Development

Fecal coliform from urban areas are attributable to multiple sources, including: domestic animals, leaks and overflows from sanitary sewer systems, illicit discharges, leaking septic systems, runoff from improper disposal of waste materials, and leachate from both operational and closed landfills.

Urban runoff can contain high concentrations of fecal coliform from domestic animals and urban wildlife. Fecal coliform bacteria enter streams by direct washoff from the land surface, or the runoff may be diverted to a storm water collection system and discharged through a discrete outlet structure. For large, medium, and small urban areas (populations greater than 50,000), the storm water outlets are regulated under MS4 permits (see Section 3.1.2). For smaller urban areas, the storm water discharge outlets currently remain unregulated.

In addition to urban animal sources of fecal coliform, there may be illicit connections to the storm sewer system. As part of the MS4 permitting program, municipalities are required to conduct dry-weather monitoring to identify and then eliminate these illicit discharges. Fecal coliform bacteria may also enter streams from leaky sewer pipes, or during storm events when combined sewer overflows discharge.

#### 3.2.3.1 Leaking Septic Systems

A portion of the fecal coliform in the Ocmulgee River Basin may be attributed to failure of septic systems and illicit discharges of raw sewage. Table 12 presents the number of septic systems in each county of the Ocmulgee River Basin existing in 1990, based on U.S. 1990 Census Data, and the number existing in 2004, based on the Georgia Department of Human Resources, Division of Public Health data. In addition, an estimate of the number of septic systems installed and repaired during the fourteen year period from 1990 to 2004 is given.

These data show that a substantial increase in the number of septic systems has occurred in several counties. Often, this is a reflection of population increases outpacing the expansion of sewage collection systems during this period. Hence, a large number of septic systems are installed to contain and treat the sanitary waste. It is estimated that there are approximately 2.37 people per household on septic systems (EPA, personal communication).

#### 3.2.3.2 Land Application Systems

Many smaller communities use land application systems (LAS) for treatment of their sanitary wastewaters. These facilities are required through LAS permits to treat all their wastewater by land application and are to be properly operated as non-discharging systems that contribute no runoff to nearby surface waters. However, runoff during storm events may carry surface residual containing fecal coliform bacteria to nearby surface waters. Some of these facilities may also exceed the ground percolation rate when applying the wastewater, resulting in surface runoff from the field. If not properly bermed, this runoff, which probably contains fecal coliform bacteria, may discharge to nearby surface waters. There are 26 permitted LAS systems located in the Ocmulgee River Basin (Table 13).

## Table 11. Estimated Agricultural Livestock Populations in the Ocmulgee River Basin

| County | Livestock | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Beef Cattle | Dairy Cattle | Swine | Sheep | Horses | Goats | Chickens-Layers | Chickens-Broilers Sold | Chickens-Breeders |
| Ben Hill | 5,100 | - | 1,400 | 1,150 | 100 | - | 480,000 | - | 5,100 |
| Bibb | 900 | 200 | - | 2,968 | - | - | 476,000 | - | 900 |
| Bleckley | 6,050 | - | 1,000 | 350 | 1,000 | - | - | - | 6,050 |
| Butts | 2,750 | 150 | 150 | 750 | - | 10 | - | - | 2,750 |
| Clayton | 550 | - | 800 | - | - | - | - | - | 550 |
| Coffee | 14,000 | 200 | 5,000 | 325 | 8,750 | 50 | 8,086,000 | 90,000 | 14,000 |
| Crawford | 1,300 | - | 175 | 275 | - | - | 1,339,500 | - | 1,300 |
| De Kalb | - | - | - | 190 | - | - | - | - | - |
| Dodge | 12,250 | - | 750 | 250 | 400 | - | - | - | 12,250 |
| Dooly | 3,100 | 420 | 200 | 85 | 3,900 | - | 1,012,000 | - | 3,100 |
| Fulton | 4,700 | - | 300 | 470 | - | - | - | - | 4,700 |
| Gwinnett | 3,500 | - | 525 | 800 | - | - | 390,000 | - | 3,500 |
| Henry | 7,925 | - | 275 | 714 | - | 45 | - | - | 7,925 |
| Houston | - | 850 | 300 | 750 | - | - | 1,088,400 | - | - |
| Jasper | 10,750 | 2,500 | 1,000 | 2,000 | - | 50 | 380,000 | 1,050,000 | 10,750 |
| Jeff Davis | 6,000 | - | 2,000 | 1,400 | 2,050 | - | 964,800 | 80,000 | 6,000 |
| Jones | 6,767 | 900 | 140 | 305 | - | 40 | 512,000 | - | 6,767 |
| Lamar | 6,800 | 730 | 1,000 | 650 | 1,025 | 50 | 1,300,000 | - | 6,800 |
| Laurens | 16,000 | 493 | 5,000 | 1,000 | 1,500 | 300 | - | - | 16,000 |
| Macon | 3,050 | 9,000 | 600 | 125 | - | - | 4,499,200 | - | 3,050 |
| Monroe | 7,300 | 1,140 | 1,000 | 275 | - | - | 1,984,500 | - | 7,300 |
| Newton | 16,900 | - | 600 | 1,740 | 390 | 100 | 120,000 | - | 16,900 |
| Peach | 1,600 | 1,000 | 200 | 750 | - | - | - | - | 1,600 |
| Pulaski | 1,800 | - | 140 | 400 | 50 | - | 308,000 | - | 1,800 |
| Rockdale | 1,000 | - | 200 | 3,500 | - | - | - | - | 1,000 |
| Spaulding | 2,750 | 270 | 65 | 750 | - | - | 208,000 | - | 2,750 |
| Telfair | 6,000 | - | 1,100 | 375 | 100 | 30 | - | 30,000 | 6,000 |
| Twiggs | 3,200 | - | 700 | 30 | 60 | - | - | - | 3,200 |
| Upson | 7,800 | 390 | 800 | 280 | - | 100 | 1,820,000 | - | 7,800 |
| Walton | 6,750 | - | 500 | 1,500 | - | - | 1,536,000 | 148,000 | 6,750 |
| Wheeler | 7,425 | - | 915 | 380 | 205 | - | - | - | 7,425 |
| Wilcox | 6,210 | 600 | - | 144 | 200 | - | 3,360,000 | - | 6,210 |

Source: NRCS, 2005

## Table 12. Number of Septic Systems in the Ocmulgee River Basin

| County | Existing Septic Systems (1990) | Existing Septic Systems (2004) | No. of Septic Systems Installed (1990 to 2004) | No. of Septic Systems Repaired (1990 to 2004) |
|---|---|---|---|---|
| Ben Hill | 2,557 | 4,111 | 1,554 | * |
| Bibb | 9,077 | 11,228 | 2,151 | 1,131 |
| Bleckley | 2,358 | 3,834 | 1,476 | 415 |
| Butts | 3,740 | 8,740 | 5,000 | 300 |
| Clayton | 10,658 | 15,880 | 5,222 | * |
| Coffee | 6,871 | 13,069 | 6,198 | 390 |
| Crawford | 2,714 | 4,251 | 1,537 | 282 |
| De Kalb | 20,432 | 21,748 | 1,316 | * |
| Dodge | 4,517 | 6,536 | 2,019 | 315 |
| Dooly | 1,914 | 2,390 | 476 | 38 |
| Fulton | 21,485 | 25,650 | 4,165 | * |
| Gwinnett | 56,752 | 80,778 | 24,026 | 6,595 |
| Henry | 14,903 | 34,903 | 20,000 | 1,000 |
| Houston | 9,058 | 16,083 | 7,025 | 699 |
| Jasper | 2,571 | 4,509 | 1,938 | 189 |
| Jeff Davis | 2,898 | 4,186 | 1,288 | 54 |
| Jones | 5,791 | 8,830 | 3,039 | 142 |
| Lamar | 2,714 | 9,714 | 7,000 | 500 |
| Laurens | 8,322 | 16,709 | 8,387 | 866 |
| Macon | 1,870 | 2,767 | 897 | * |
| Monroe | 4,280 | 7,784 | 3,504 | 196 |
| Newton | 9,491 | 24,491 | 15,000 | 781 |
| Peach | 3,268 | 5,452 | 2,184 | 239 |
| Pulaski | 1,696 | 2,853 | 1,157 | 98 |
| Rockdale | 10,455 | 12,901 | 2,446 | 464 |
| Spaulding | 10,243 | 14,911 | 4,668 | 1,033 |
| Telfair | 2,056 | 2,919 | 863 | 86 |
| Twiggs | 2,946 | 4,025 | 1,079 | 93 |
| Upson | 5,942 | 7,942 | 2,000 | 750 |
| Walton | 7,931 | 21,408 | 13,477 | 1,261 |
| Wheeler | 1,389 | 2,098 | 709 | 98 |
| Wilcox | 1,944 | 2,387 | 443 | 49 |

Source: 1990 Census Data, and the Georgia Dept. of Human Resources, Div. of Public Health, 2006 (* data not available)

**Table 13. Permitted Land Application Systems in the Ocmulgee River Basin**

| LAS Name | County | Permit No. | Type | Flow (MGD) |
|---|---|---|---|---|
| Atlanta South KOA | Peach | GA01-573 | Private | |
| Butts Co Water & Sewer Las | Butts | GA02-038 | Municipal | 0.3 |
| CA Simpson Commercial Property | Butts | GA02-225 | Private | 0.3 |
| Chester | Dodge | GA02-202 | Municipal | 0.175 |
| Christ Sanctified Holy Church | Newton | GA02-055 | Private | 4.8 |
| Clayton Co Huie Las | Clayton | GA02-008 | Municipal | 19.5 |
| Covington | Newton | GA02-055 | Municipal | 4.8 |
| Fitzgerald Water, Light, And Bond | Ben Hill | GA02-240 | Municipal | |
| Flying J. Travel Plaza | Dooly | GA02-151 | Private | 0.54 |
| GA Diagnostic Center | Butts | GA02-245 | Public | 0.225 |
| GA Public Safety Training Center | Monroe | GA02-201 | Public | 0.12 |
| Henry Co Indian Creek | Henry | GA02-250 | Municipal | 1.5 |
| Henry Co Simpson Mill LAS | Henry | GA02-203 | Municipal | 0.18 |
| Henry Co Springdale LAS | Henry | GA02-239 | Municipal | 1.1 |
| Henry Co Walnut Creek Reclamation Facility | Henry | GA02-137 | Municipal | 4 |
| Locust Grove LAS | Henry | GA02-070 | Municipal | 0.3 |
| Loganville LAS | Walton | GA02-174 | Municipal | 0.25 |
| McRae LAS | Telfair | GA02-248 | Municipal | 0.8 |
| Melrose Subdivision | Henry | GA03-832 | Private | |
| Milan LAS | Dodge | GA02-086 | Municipal | 0.2 |
| Newton County High School | Newton | GA02-005 | Private | |
| Newton County Water And Sewerage Authority | Newton | GA02-013 | Municipal | 1.8 |
| Publix Super Market | Gwinnett | GA02-220 | Private | |
| Stoffell Dairy | Henry | GA03-829 | Industrial | 0.02 |
| Unadilla | Dooly | GA02-151 | Municipal | 0.54 |
| Winding River Development | Houston | GA03-623 | Private | 2 |

Source: Permitting Compliance and Enforcement Program, GA EPD, Atlanta, Georgia, 2006

### 3.2.3.3 Landfills

Leachate from landfills may contain fecal coliform bacteria that may at some point discharge into surface waters. Sanitary (or municipal) landfills are the most likely to serve as a source of fecal coliform bacteria. These types of landfills receive household wastes, animal manure, offal, hatchery and poultry processing plant wastes, dead animals, and other types of wastes. Older sanitary landfills were not lined and most have been closed. Those that remain active and have not been lined operate as construction/demolition landfills. Currently active sanitary landfills are lined and have leachate collection systems. All landfills, excluding inert landfills, are now required to install environmental monitoring systems for groundwater and methane sampling.

There are 153 known landfills in the Ocmulgee River Basin (Table 14). Of these, 25 are active landfills and 128 are inactive or closed. As shown in Table 14, many of the older, inactive landfills were never permitted.

## Table 14. Landfills in the Ocmulgee River Basin

| Name | County | Permit No. | Type | Status |
|---|---|---|---|---|
| Abbeville | Wilcox | | NA | Inactive |
| Adams Road | Newton | | NA | Inactive |
| Alamo | Wheeler | | NA | Inactive |
| Almon Road | Newton | | NA | Inactive |
| Apac/Ga-Donzi Ln Ph 2 (L) | DeKalb | 044-029D(L) | Construction & Demolition Landfill | Closed |
| Apac/Ga-Donzi Ln Ph 3 (L) | DeKalb | 044-033D(L) | Construction & Demolition Landfill | Closed |
| Apac/Ga-Donzi Ln Ph 4 (L) | DeKalb | 044-040D(L) | Construction & Demolition Landfill | Closed |
| Apac/Ga-Donzi Ln Ph 5a (L) | DeKalb | 044-042D(L) | Construction & Demolition Landfill | Operating |
| Apac/Ga-Donzi Ln Ph 5b (L) | DeKalb | 044-044D(L) | Construction & Demolition Landfill | Operating |
| Atlanta-Confederate Ave (L) | Fulton | 060-057D(L) | Construction & Demolition Landfill | Closed |
| Atlanta-Key Rd (SL) | Fulton | 060-048D(SL) | Sanitary Landfill | Closed |
| Barnesville - Gordon Rd. | Lamar | | NA | Inactive |
| Barnesville - Jackson Rd. | Lamar | | NA | Inactive |
| Barnesville-Goggins Rd (L) | Lamar | 085-005D(L) | Dry Trash Landfill | Closed |
| Barnesville-Goggins Rd (SL) | Lamar | 085-006D(SL) | Sanitary Landfill | Closed |
| Barrow Refuse - Carter Landfill | Walton | | NA | Inactive |
| Bell Brothers | Clayton | | NA | Inactive |
| Ben Hill Co. - Fitzgerald | Ben Hill | | NA | Inactive |
| BFI - Henrico Road | De Kalb | 044-010D(SL) | Sanitary Landfill | |
| BFI-East DeKalb Landfill | DeKalb | 044-049D(C&D) | Construction & Demolition Landfill | Operating |
| BFI-Hickory Ridge (MSWL) | DeKalb | 044-048D(SL) | Municipal Solid Waste Landfill | Operating |
| Bibb Co. - Ga Power Co, Plant Arkwright | Bibb | 011-025D(LI) | Industrial Landfill | Operating |
| Bibb Co. - Airport | Bibb | | NA | Inactive |
| Bleckley Co. - Cochran-Sr 26 (SL) | Bleckley | 012-004D(SL) | Sanitary Landfill | Closed |
| Britt - Bermuda Rd., Stone Mtn. | DeKalb | 044-030D(L) | NA | Inactive |
| Buford-Tuggle Greer Rd (L) | Gwinnett | 067-019D(L) | Dry Trash Landfill | Closed |
| Button Gwinnett-Arnold Rd Ph 1 (SL) | Gwinnett | 067-021D(SL) | Sanitary Landfill | Closed |
| Button Gwinnett-Arnold Rd Ph 3 (SL) | Gwinnett | 067-037D(SL) | Municipal Solid Waste Landfill | Closed |
| Butts Co.-Brownlee Rd (SL) | Butts | 018-004D(SL) | Sanitary Landfill | Closed |
| Butts Co.-Pine Ridge Recycling (MSWL) | Butts | 018-008D(MSWL) | Municipal Solid Waste Landfill | Operating |
| Camp Road | DeKalb | | NA | Inactive |
| Campbell And Sons, Ind. | Houston | 076-013D(L) | NA | Inactive |
| Chauncey | Dodge | | NA | Inactive |
| Clayton Co. Sr3, Lovejoy | Clayton | 031-001D(SL) | NA | Inactive |
| Clayton Co.-Sr 3 Lovejoy #2 (SL) | Clayton | 031-027D(SL) | Sanitary Landfill | Closed |
| Clayton Co.-Sr 3 Lovejoy Site # 3 | Clayton | 031-037D(SL) | Municipal Solid Waste Landfill | Operating |
| Conyers - Miller Bottom Rd., Ph. 2 | Rockdale | 122-004D(SL) | NA | Inactive |
| Conyers-Miller Bottom Rd Ph 2-4 (SL) | Rockdale | 122-016D(SL) | Sanitary Landfill | Closed |
| Covington | Newton | | NA | Inactive |
| Crawford Co.-Sr 341/Hopeville Rd (SL) | Crawford | 039-006D(SL) | Sanitary Landfill | Closed |
| Crymes | Gwinnett | 067-024D(SL) | NA | Inactive |

| Name | County | Permit No. | Type | Status |
|---|---|---|---|---|
| Crymes Enterprises Us 29 (SL) | Gwinnett | 067-017D(SL) | Sanitary Landfill | |
| DeKalb Co.-Seminole Rd Ph 1 (SL) | DeKalb | 044-017D(SL) | Sanitary Landfill | Closed |
| DeKalb Co.-Seminole Rd Ph 2 (SL) | DeKalb | 044-037D(SL) | Construction & Demolition Landfill | Operating |
| DeKalb Co.-Seminole Rd Ph 2a, 3&4 (SL) | DeKalb | 044-050D(SL) | Municipal Solid Waste Landfill | Operating |
| Dodge Co. - Us 341s, Sugar Creek | Dodge | | NA | Inactive |
| Dodge Co-Bay Spring Church Rd (SL) | Dodge | 045-005D(SL) | Sanitary Landfill | Closed |
| Dodge Co-Cr 274 (Dodge Ave) Eastman | Dodge | 045-007D(SL) | Sanitary Landfill | Closed |
| Donzi Lane | DeKalb | 044-002D(L) | NA | Inactive |
| Eastman - Hwy. 46 | Dodge | | NA | Inactive |
| Elberta | Houston | | NA | Inactive |
| Elijah Patrick - Bethlehem Rd. | Henry | | NA | Inactive |
| Exchange Park | De Kalb | 044-006D(SL) | Sanitary Landfill | |
| FFA-FHA Camp | Newton | | NA | Inactive |
| Fitzgerald, Kiochee Church Rd, Ph.2 | Ben Hill | 009-005D(SL) | Municipal Solid Waste Landfill | Operating |
| Fitzgerald-Kiochee Church Rd Ph 1 (SL) | Ben Hill | 009-004D(SL) | Sanitary Landfill | Closed |
| Forsyth | Monroe | | NA | Inactive |
| Forsyth, Old Brent Rd, Ph 1 & 2 | Monroe | 102-002D(SL) | Sanitary Landfill | Closed |
| Fort Valley | Peach | | NA | Inactive |
| Ga Power-Plant Scherer Ph 3 (LI) | Monroe | 102-007D(LI) | Industrial Landfill | Operating |
| Gartrell A. Nash | Gwinnett | | NA | Inactive |
| Georgia - Pacific Co. | Jasper | | NA | Inactive |
| Georgia 87 | Butts | | NA | Inactive |
| Georgia Diagnostic Center | Butts | 018-003D(SL) | Sanitary Landfill | |
| Georgia Diagnostic Center | Butts | 018-003D(SL) | NA | Inactive |
| Grayson | Gwinnett | | NA | Inactive |
| Griswoldville Rd. | Jones | | NA | Inactive |
| Hawkinsville - Ga 126 | Pulaski | | NA | Inactive |
| Hayneville | Houston | | NA | Inactive |
| Helena - Sugar Creek | Telfair | 134-011D(SL) | Sanitary Landfill | |
| Henry Co. - Hwy 20 | Henry | 075-011D(SL) | NA | Inactive |
| Henry Co. - W. Asbury Rd., Ph. 1 | Henry | 075-024P(INC) | NA | Inactive |
| Henry Co-W Asbury Rd Ph 1 (SL) | Henry | 075-015D(SL) | Sanitary Landfill | Closed |
| Henry Co-W Asbury Rd Ph 2 (SL) | Henry | 075-021D(SL) | Sanitary Landfill | Closed |
| Houston Co - Sr 247 Klondike MSWL | Houston | 076-020D(SL) | Municipal Solid Waste Landfill | Operating |
| Houston Co - Sr247 Klondike (C/D) | Houston | 076-024D(C&D) | Construction & Demolition Landfill | Operating |
| Houston Co-Old Perry Rd Ph 1 (SL) | Houston | 076-005D(SL) | Sanitary Landfill | Closed |
| Houston County (Bonaire) | Houston | | NA | Inactive |
| J.M. Huber Stone Creek Church Rd (LI) | Twiggs | 143-001D(LI) | Industrial Landfill | Operating |
| J.N. Stokes | Houston | | NA | Inactive |
| Jacksonville | Telfair | | NA | Inactive |
| Jeff Davis Co-Cr 20 (L) | Jeff Davis | 080-006D(L) | Construction & Demolition Landfill | Closed |
| Jeff Davis Co-Cr 20 (SL) | Jeff Davis | 080-005D(SL) | Sanitary Landfill | Closed |
| Jeff Davis County - Cr 20 - Site 2 | Jeff Davis | APL-0801 | | |

| Name | County | Permit No. | Type | Status |
|---|---|---|---|---|
| John Abercrombie - Ragsdale Rd. | DeKalb | | NA | Inactive |
| John Warchak & Ronald Fanconniere L/F | Bibb | 011-009D(L) | NA | Inactive |
| Jones - Chandler | DeKalb | | NA | Inactive |
| Jones Co-Cumslo Rd Ph 2 (SL) | Jones | 084-006D(SL) | Sanitary Landfill | Closed |
| Jones Co-Cumslo Rd, Cr S1079, Gray | Jones | 084-002D(SL) | Sanitary Landfill | Closed |
| Jordan- Brownell | De Kalb | 044-016D(L) | Dry Trash Landfill | |
| Lackey Road | Newton | 107-009D(SL) | NA | Inactive |
| Lawrenceville (New) | Gwinnett | | NA | Inactive |
| Lawrenceville (Old) | Gwinnett | | NA | Inactive |
| Lewis B. Wilson (Landfill) | Bibb | | NA | Inactive |
| Lionel Leisure City | Clayton | | NA | Inactive |
| Lithonia | DeKalb | | NA | Inactive |
| Loganville | Walton | | NA | Inactive |
| Lumber City (River) | Telfair | | NA | Inactive |
| Macon - Walker Rd Ph 2 (SL) | Bibb | 011-017D(SL) | Unlined Sanitary Landfill | Operating |
| Macon-11th St Ph 1 (SL) | Bibb | 011-007D(SL) | Sanitary Landfill | Closed |
| McRae | Wheeler | | NA | Inactive |
| Milan | Dodge | | NA | Inactive |
| Milstead | Rockdale | | NA | Inactive |
| Monroe Co-Strickland Loop Rd | Monroe | 102-008D(SL) | Municipal Solid Waste Landfill | Operating |
| Mullis - Davis/Grisold Rds. Ph. 1 | Bibb | 011-021P(RM) | NA | Inactive |
| Newton Co - Low Riv Rd Site#2 He MSLW | Newton | 107-013D(SL)(2) | Municipal Solid Waste Landfill | Operating |
| Newton Co-Forest Tower/Lwr Rvr Rds (SL) | Newton | 107-013D(SL) | Construction & Demolition Landfill | Operating |
| Newton Co-Lackey Rd Ph 3 (SL) | Newton | 107-011D(SL) | Sanitary Landfill | Closed |
| Oxford | Newton | | NA | Inactive |
| Oxford Landfill | Newton | | NA | Inactive |
| Oxford Landfill (New) | Newton | | NA | Inactive |
| Panola Road | De Kalb | 044-003D(L) | Dry Trash Landfill | |
| Patillo Const. Co. | DeKalb | 044-021D(L) | NA | Inactive |
| Pattillo-Mtn Ind Blvd Ph 2 & 3 (L) | DeKalb | 044-032D(L) | Construction & Demolition Landfill | Closed |
| Perry-Chapel Rd/Ford Creek (L) | Houston | 076-022D(L) | Construction & Demolition Landfill | Closed |
| Perry-Elko Rd (SL) | Houston | 076-009D(SL) | Sanitary Landfill | Closed |
| Phillips Bros. | DeKalb | | NA | Inactive |
| Phillips-Scales Rd C&D (L) | DeKalb | 044-046D(C&D) | Construction & Demolition Landfill | Operating |
| Pine Ridge Recycling | Butts | APL0181 | | |
| Pinehurst | Dooly | | NA | Inactive |
| Pineview | Wilcox | | NA | Inactive |
| Porterdale-Sr 81 (L) | Newton | 107-010D(L) | Dry Trash Landfill | Closed |
| Powersville | Peach | | NA | Inactive |
| Price-Cleveland Ave (L) | Fulton | 060-029D(L) | Construction & Demolition Landfill | Closed |
| Pulaski Co-Us 129 Hawkinsville (SL) | Pulaski | 116-002D(SL) | Sanitary Landfill | Closed |
| Rhine-Mill Creek (L) | Dodge | 045-006D(L) | Dry Trash Landfill | Closed |
| Rochelle | Wilcox | | NA | Inactive |

| Name | County | Permit No. | Type | Status |
|---|---|---|---|---|
| Rogers Lake Road | DeKalb | 044-038C(TS) | NA | Inactive |
| Rogers Lake Road C&D Landfill | DeKalb | 044-041D(L) | Construction & Demolition Landfill | Operating |
| Sama - Lakeshore Trailer Pk. | Bibb | | NA | Inactive |
| Seminole Rd. - Shredder | DeKalb | 044-039P(SH) | NA | Inactive |
| Sixth St. (Hawkinsville) | Pulaski | | NA | Inactive |
| Sledgeville | Peach | | NA | Inactive |
| Spalding Co-Yamacraw Rd Ph 1 Tct A | Spalding | 126-001D(SL) | Sanitary Landfill | Closed |
| Stewart Road | Newton | | NA | Inactive |
| Sunrise Lakes | Rockdale | | NA | Inactive |
| Swift Creek Landfill | Bibb | 011-018D(L) | Construction & Demolition Landfill | Operating |
| Swift Creek MSW Landfill | Bibb | 011-026D(SL) | Municipal Solid Waste Landfill | Operating |
| Telfair Co - Cr 144 MSWL | Telfair | 134-015D(MSWL) | Municipal Solid Waste Landfill | Operating |
| Telfair Co-S 2316 (SL) | Telfair | 134-009D(SL) | Sanitary Landfill | Closed |
| Tom Arnold | Gwinnett | 067-011D(SL) | NA | Inactive |
| Unadilla | Dooly | | NA | Inactive |
| W.C. Winter | DeKalb | | NA | Inactive |
| Walton Co. - Sr11/Roscoe Davis Rd. | Walton | 147-009D(SL) | NA | Inactive |
| Walton Co. - Walls | Walton | | NA | Inactive |
| Walton Co. Sr 11 Monroe | Walton | 147-004D(SL) | Sanitary Landfill | |
| Walton Co-Sr 11/Roscoe Davis Rd Ph 3 | Walton | 147-010D(SL) | Sanitary Landfill | Closed |
| Warchak - Cochran Short Rt. | Bibb | | NA | Inactive |
| Warchak - Ibex St. | Bibb | | NA | Inactive |
| Warchak - Upper River Rd. | Bibb | 011-008D(L) | NA | Inactive |
| Warner Robins | Houston | | NA | Inactive |
| WMI-Live Oak #1 (SL) | DeKalb | 044-035D(SL) | Municipal Solid Waste Landfill | Operating |
| WMI-Live Oak #2 (SL) | DeKalb | 044-047D(MSWL) | Municipal Solid Waste Landfill | Operating |

Source: Land Protection Branch, GA DNR, 2005

# 4.0 ANALYTICAL APPROACH

The process of developing fecal coliform TMDLs for the Ocmulgee River Basin listed segments includes the determination of the following:

- The current critical fecal coliform load to the stream under existing conditions;
- The TMDL for similar conditions under which the current load was determined; and
- The percent reduction in the current critical fecal coliform load necessary to achieve the TMDL.

The calculation of the fecal coliform load at any point in a stream requires the fecal coliform concentration and stream flow. The Loading Curve Approach was used to determine the current fecal coliform load and the TMDL. For the listed segments, fecal coliform sampling data were sufficient to calculate at least one 30-day geometric mean to compare with the regulatory criteria (see Appendix A).

## 4.1 Loading Curve Approach

For those segments in which sufficient water quality data were collected to calculate at least one 30-day geometric mean that was above the regulatory standard, the loading curve approach was used. This method involves comparing the current critical load to summer and winter seasonal TMDL curves.

As mentioned in Section 2.0, the USGS monitored many of the listed segments and collected stream flow information concurrently with water quality samples. Stream depths were measured and used to determine stream flows, based on rating curves developed by the USGS for each sampling location.

In cases where no stream flow measurements were available, flow on the day the fecal coliform samples were collected was estimated using data from a nearby gaged stream. The nearby stream had relatively similar watershed characteristics, including landuse, slope, and drainage area. The stream flows were estimated by multiplying the gaged flow by the ratio of the listed stream drainage area to the gaged stream drainage area. Table 15 lists those segments for which no flow data were available and indicates the gaged station that was used to estimate the flow.

The current critical loads were determined using fecal coliform data collected within a 30-day period to calculate the geometric means, and multiplying these values by the arithmetic means of the flows measured at the time the water quality samples were collected. Georgia's instream fecal coliform standards are based on a geometric mean of samples collected over a 30-day period, with samples collected at least 24 hours apart. To reflect this in the load calculation, the fecal coliform loads are expressed as 30-day accumulated loads with units of counts per 30 days. This is described by the equation below:

$$L_{critical} = C_{geomean} \times Q_{mean}$$

Where:

$L_{critical}$ = current critical fecal coliform load
$C_{geomean}$ = fecal coliform concentration as a 30-day geometric mean
$Q_{mean}$ = stream flow as an arithmetic mean

## Table 15. Stream Segments with Estimated Flows and Corresponding USGS Flow Gages

| Monitoring Station | USGS Station Name | Station No. |
|---|---|---|
| Alcovy River - Headwaters to Walton Co | Alcovy River Above Covington, GA | 02208450 |
| Alcovy River - Cedar Creek to Bay Creek | Alcovy River Above Covington, GA | 02208450 |
| Alcovy River - Mountain Creek to Big Flat Creek | Alcovy River Above Covington, GA | 02208450 |
| Almand Branch -Tanyard Branch to Snapping Shoals | Yellow River Near Snelville, GA | 02206500 |
| Bay Creek - Headwaters to Alcovy River | Alcovy River Above Covington, GA | 02208450 |
| Beaver Ruin Creek Gwinnett County | Yellow River Near Snellville, GA | 02206500 |
| Big Flat Creek Headwaters to Flat Creek | Alcovy River Above Covington, GA | 02208450 |
| Big Haynes Creek Headwaters to Brushy Fork Creek | Yellow River Near Snellville, GA | 02206500 |
| Big Haynes Creek Brushy Fork Cr to Little Panther Cr | Yellow River Near Snellville, GA | 02206500 |
| Big Haynes Creek Little Haynes Creek to Yellow River | Yellow River Near Snellville, GA | 02206500 |
| Big Sandy Creek Aboothlacoosta Cr to Ocmulgee River | Tobesofkee Creek Near Macon, GA | 02213500 |
| Bromolow Creek Headwaters to Beaver Ruin Creek | Yellow River Near Snellville, GA | 02206500 |
| Brushy Fork Creek - Lake Carlton to Big Haynes Creek | Yellow River Near Snellville, GA | 02206500 |
| Cabin Creek Headwaters, Griffin to Towaliga River | Tobesofkee Creek Near Macon, GA | 02213500 |
| Camp Creek Headwaters to Jackson Creek | Yellow River Near Snellville, GA | 02206500 |
| Cedar Creek Headwaters to Alcovy River | Yellow River Near Snellville, GA | 02206500 |
| Cobbs Creek Headwaters to Shoal Creek | South River At Klondike Rd, nr Lithonia | 02204070 |
| Conley Creek Headwaters to South River | South River At Klondike Rd, nr Lithonia | 02204070 |
| Doolittle Creek Headwaters to South River | South River At Klondike Rd, nr Lithonia | 02204070 |
| Falling Creek Little Falling Creek to Ocmulgee River | Falling Creek Near Juliette, GA | 02212600 |
| Honey Creek Headwaters to South River | South River At Klondike Rd, nr Lithonia | 02204070 |
| Hopkins Creek Headwaters to Alcovy River | Alcovy River Above Covington, GA | 02208450 |
| Intrenchment Creek Headwaters to South River, Atlanta | South River At Klondike Rd, nr Lithonia | 02204070 |
| Jacks Creek Headwaters to Yellow River | Yellow River Near Snellville, GA | 02206500 |
| Jackson Creek Gwinnett County | Yellow River Near Snellville, GA | 02206500 |
| Little Haynes Creek Hwy 20 to Big Haynes Creek | Yellow River Near Snellville, GA | 02206500 |
| Little Stone Mountain Cr Headwaters to Stone Mountain Lake | Yellow River Near Snellville, GA | 02206500 |
| Little Suwannee Creek Lake Perrin to Yellow River | Yellow River Near Snellville, GA | 02206500 |
| McClain Branch Headwaters to Honey Creek | South River At Klondike Rd, nr Lithonia | 02204070 |
| No Business Creek Headwaters to Norris Lake | Yellow River Near Snellville, GA | 02206500 |
| Pew Creek Gwinnett County | Yellow River Near Snellville, GA | 02206500 |

| Monitoring Station | USGS Station Name | Station No. |
|---|---|---|
| Shetley Creek Headwaters to Bromolow Creek | Yellow River Near Snellville, GA | 02206500 |
| Shoal Creek Headwaters to Alcovy River, Lawrenceville | Alcovy River Above Covington, GA | 02208450 |
| Shoal Creek Headwaters to South River | South River At Klondike Rd, nr Lithonia | 02204070 |
| Snapfinger Creek DeKalb County | South River At Klondike Rd, nr Lithonia | 02204070 |
| Snapping Shoals Creek Almand Branch to South River | South River At Klondike Rd, nr Lithonia | 02204070 |
| South River Pole Bridge Creek to Hwy 20 | South River At Klondike Rd, nr Lithonia | 02204070 |
| South River Flakes Mill Road to Pole Bridge Creek | South River At Klondike Rd, nr Lithonia | 02204070 |
| South River Hwy 20 to Snapping Shoals Creek | South River At Klondike Rd, nr Lithonia | 02204070 |
| South River Snapping Shoals to Jackson Lake | South River At Klondike Rd, nr Lithonia | 02204070 |
| South River Atlanta to Flakes Mill Road | South River At Klondike Rd, nr Lithonia | 02204070 |
| Stone Mountain Creek Headwaters to Stone Mountain Lake | Yellow River Near Snellville, GA | 02206500 |
| Sugar Creek u/s Memorial Drive to South River | Yellow River Near Snellville, GA | 02206500 |
| Sweetwater Creek Lee Daniel Creek to Yellow River | Yellow River Near Snellville, GA | 02206500 |
| Swift Creek Headwaters to Yellow River | Yellow River Near Snellville, GA | 02206500 |
| Tobesofkee Creek Lake Tobesofkee to Rocky Creek | Tobesofkee Creek Near Macon, GA | 02213500 |
| Towaliga River - Indian Creek to High Falls | Tobesofkee Creek Near Macon, GA | 02213500 |
| Town Branch Headwaters to Aboothlacoosta Creek | Tobesofkee Creek Near Macon, GA | 02213500 |
| Turkey Creek Headwaters to Yellow River | Yellow River Near Snellville, GA | 02206500 |
| Watson Creek Headwaters to Yellow River | Yellow River Near Snellville, GA | 02206500 |
| Wise Creek Headwaters to Ocmulgee River | South River At Klondike Rd, nr Lithonia | 02204070 |
| Yellow River Big Haynes Creek to Jackson Lake | Yellow River Near Snellville, GA | 02206500 |
| Yellow River Hammock Creek to Big Haynes Creek | Yellow River Near Snellville, GA | 02206500 |
| Yellow River Sweetwater Creek to Centerville Creek | Yellow River Near Snellville, GA | 02206500 |
| Yellow River -Centerville Creek to Hammock Creek | Yellow River Near Snellville, GA | 02206500 |
| Yellow River - Headwaters to Harris Lake | Yellow River Near Snellville, GA | 02206500 |
| Yellow River - Harris Lake to Pew Creek | Yellow River Near Snellville, GA | 02206500 |

The current estimated critical load is dependent on the fecal coliform concentrations and stream flows measured during the sampling events. The number of events sampled is usually 16 per year. Thus, these loads do not represent the full range of flow conditions or loading rates that can occur. Therefore, it must be kept in mind that the current critical loads used only represent the worst-case scenario that occurred among the time periods sampled.

The maximum fecal coliform load at which the instream fecal coliform criteria will be met can be determined using a variation of the equation above. By setting C equal to the seasonal, instream fecal coliform standards, the load will equal the TMDL. However, the TMDL is

dependent on stream flow. Figures in Appendix A graphically illustrate that the TMDL is a continuum for the range of flows (Q) that can occur in the stream over time. There are two TMDL curves shown in these figures. One represents the summer TMDL for the period May through October when the 30-day geometric mean standard is 200 counts/100 mL. The second curve represents the winter TMDL for the period November through April when the 30-day geometric mean standard is 1,000 counts/100 mL. The equations for these two TMDL curves are:

$$TMDL_{summer} = 200 \text{ counts (as a 30-day geometric mean)/100 mL} \times Q$$

$$TMDL_{winter} = 1{,}000 \text{ counts (as a 30-day geometric mean)/100 mL} \times Q$$

The graphs show the relationship between the current critical load ($L_{critical}$) and the TMDL. The TMDL for a given stream segment is the load for the mean flow corresponding to the current critical load. This is the point where the current load exceeds the TMDL curve by the greatest amount. This critical TMDL can be represented by the following equation:

$$TMDL_{critical} = C_{standard} \times Q_{mean}$$

Where:

$TMDL_{critical}$ = critical fecal coliform TMDL load

$C_{standard}$ = seasonal fecal coliform standard (as a 30-day geometric mean)
summer - 200 counts/100 mL
winter - 1,000 counts/ 100 mL

$Q_{mean}$ = stream flow as an arithmetic mean (same as used for $L_{critical}$)

A 30-day geometric mean load that plots above the respective seasonal TMDL curve represents an exceedance of the instream fecal coliform standard. The difference between the current critical load and the TMDL curve represents the load reduction required for the stream segment to meet the appropriate instream fecal coliform standard. There is also a single sample maximum criterion (4,000 counts per 100 milliliters) for the months of November through April. If a single sample exceeds the maximum criterion, and the seasonal geometric mean criteria is also exceeded, then the TMDL is based on the criteria exceedance requiring the largest load reduction. The load reduction can be expressed as follows:

$$\text{Load Reduction} = \frac{L_{critical} - TMDL_{critical}}{L_{critical}} \times 100$$

# 5.0 TOTAL MAXIMUM DAILY LOADS

A Total Maximum Daily Load (TMDL) is the amount of a pollutant that can be assimilated by the receiving waterbody without exceeding the applicable water quality standard; in this case, the seasonal fecal coliform standards. A TMDL is the sum of the individual waste load allocations (WLAs) from point sources and load allocations (LAs) for nonpoint sources, as well as natural background (40 CFR 130.2) for a given waterbody. The TMDL must also include a margin of safety (MOS), either implicitly or explicitly, that accounts for the uncertainty in the relationship between pollutant loads and the water quality response of the receiving water body. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measures. For fecal coliform bacteria, the TMDLs are expressed as counts per 30 days as a geometric mean.

A TMDL is expressed as follows:

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

The TMDL calculates the WLAs and LAs with margins of safety to meet the stream's water quality standards. The allocations are based on estimates that use the best available data and provide the basis to establish or modify existing controls so that water quality standards can be achieved. In developing a TMDL, it is important to consider whether adequate data are available to identify the sources, fate, and transport of the pollutant to be controlled.

TMDLs may be developed using a phased approach. Under a phased approach, the TMDL includes: 1) WLAs that confirm existing limits and controls or lead to new limits, and 2) LAs that confirm existing controls or include implementing new controls (USEPA, 1991). A phased TMDL requires additional data be collected to determine if load reductions required by the TMDL are leading to the attainment of water quality standards.

The TMDL Implementation Plan establishes a schedule or timetable for the installation and evaluation of point and nonpoint source control measures, data collection, assessment of water quality standard attainment, and if needed, additional modeling. Future monitoring of the listed segment water quality will then be used to evaluate this phase of the TMDL, and if necessary, to reallocate the loads.

The fecal coliform loads calculated for each listed stream segment include the sum of the total loads from all point and nonpoint sources for the segment. The load contributions to the listed segment from unlisted upstream segments are represented in the background loads, unless the unlisted segment contains point sources that had permit violations for fecal coliform. In these cases, the upstream point sources are included in the wasteload allocations for the listed segment. In situations where two or more adjacent segments are listed, the fecal coliform loads to each segment are individually evaluated on a localized watershed basis. Point source loads originating in upstream segments are included in the background loads of the downstream segment. The following sections describe the various fecal coliform TMDL components.

## 5.1 Waste Load Allocations

The waste load allocation is the portion of the receiving water's loading capacity that is allocated to existing or future point sources. WLAs are provided to the point sources from municipal and industrial wastewater treatment systems with NPDES effluent limits. There are 22 active NPDES permitted facilities with fecal coliform permit limits in the Ocmulgee River Basin

watershed that discharge into listed segments or have permit violations upstream of a listed segment. The maximum allocated fecal coliform loads for these municipal and industrial wastewater treatment facilities are given in Table 16. These WLA loads were calculated from the permitted or design flows and permitted fecal coliform concentrations. If the permit had no fecal coliform limit, a concentration of 200 counts/100 mL was used. These were expressed as accumulated loads over a 30-day period, and presented in units of counts per 30 days. If a facility expands its capacity and the permitted flow increases, the wasteload allocation for the facility would increase in proportion to the flow.

**Table 16. WLAs for the Ocmulgee River Basin**

| Facility Name | Permit No. | Receiving Stream | Listed Stream Segment | WLA (counts/30 days) |
|---|---|---|---|---|
| Alamo | GA0037753 | Alligator Creek | Alligator Creek | 8.53 E+10 |
| Barnesville Gordon Rd | GA0021041 | Tobesofkee Creek | Tobesofkee Creek - Barnesville to Cole Creek | 2.73 E+11 |
| DeKalb Co Polebridge Cr | GA0026816 | South River | South River - Pole Bridge Creek to Hwy 20 | 4.55 E+12 |
| DeKalb Co Snapfinger Cr | GA0024147 | South River | Flakes Mill Road to Pole Bridge Creek | 8.19 E+12 |
| Fort Valley WPCP | GA0031046 | Bay Creek | Bay Cr - Headwaters to Beaver Creek | 5.01 E+11 |
| Griffin Cabin Creek | GA0020214 | Cabin Creek | Cabin Creek - Headwaters Griffin to Towaliga River | 3.41 E+11 |
| Gwinnett Co Beaver Ruin/Sweetwater Creek | GA0032841 | Sweetwater Cr Tributary | Sweetwater Creek - Lee Daniel Creek To Yellow River | 1.02 E+12 |
| Gwinnett Co Jacks Cr | GA0047627 | Yellow River | Yellow River - Sweetwater Creek To Centerville Creek | 2.28 E+11 |
| Gwinnett Co Jackson Creek | GA0030732 | Jackson Creek | Jackson Creek – Gwinnett Co | 6.83 E+11 |
| Gwinnett Co No Business | GA0023973 | No Business Creek | No Business Cr - Headwaters To Norris Lake | 2.28 E+11 |
| Gwinnett Co Yellow River | GA0047911 | Yellow River | Sweetwater Creek To Centerville Creek | 3.56 E+11 |
| Jackson Southside | GA0023931 | Town Branch Tributary | Town Branch - Head Waters To Aboothlacoosta Creek | 1.59 E+11 |
| Lakeview Utilities Inc | GA0035491 | Yellow River | Yellow River - Hammock Creek To Big Haynes Creek | 3.59 E+10 |
| Loganville WPCP | GA0020788 | Big Flat Creek Tributary | Big Flat Creek - Headwaters To Flat Creek | 3.98 E+11 |
| Perdue Farms | GA0002844 | Big Indian Creek Tributary | Big Indian Creek - Mossy Creek To Ocmulgee River | 9.10 E+11 |
| Perry WPCP | GA0021334 | Big Indian Creek | Big Indian Creek - Mossy Creek To Ocmulgee River | 6.83 E+11 |
| Rockdale Co Almand Branch | GA0021610 | Almand Branch Tributary | Almand Branch - Tanyard Branch To Snapping Shoals | 2.84 E+11 |
| Rockdale Co Honey Creek | GA0022659 | McClain Branch | McClain Branch - Headwaters To Honey Creek | 6.83 E+10 |
| Rockdale Co Quigg Branch | GA0047678 | Yellow River | Yellow River – Hammock Creek To Big Haynes Creek | 6.83 E+11 |
| Rockdale Co Snapping Shoals | GA0023035 | Snapping Shoals Cr | Snapping Shoals Cr - Almand Branch To South River | 1.02 E+11 |
| Springs Industries, Inc Griffin | GA0003409 | Cabin Creek | Cabin Creek - Headwaters Griffin to Towaliga River | 4.55 E+11 |

State and Federal Rules define storm water discharges covered by NPDES permits as point sources. However, storm water discharges are from diffuse sources and there are multiple storm water outfalls. Storm water sources (point and nonpoint) are different than traditional NPDES permitted sources in four respects: 1) they do not produce a continuous (pollutant loading) discharge; 2) their pollutant loading depends on the intensity, duration, and frequency of rainfall events, over which the permittee has no control; 3) the activities contributing to the pollutant loading may include the various allowable activities of others, and control of these activities is not solely within the discretion of the permittee; and 4) they do not have wastewater treatment plants that control specific pollutants to meet numerical limits.

The intent of storm water NPDES permits is not to treat the water after collection, but to reduce the exposure of storm water to pollutants by implementing various controls. It would be infeasible and prohibitively expensive to control pollutant discharges from each storm water outfall. Therefore, storm water NPDES permits require the establishment of controls or BMPs to reduce the pollutants entering the environment.

The waste load allocations from storm water discharges associated with MS4s (WLAsw) are estimated based on the percentage of urban area in each watershed covered by the MS4 storm water permit. At this time, the portion of each watershed that goes directly to a permitted storm sewer and that which goes through non-permitted point sources, or is sheet flow or agricultural runoff, has not been clearly defined. Thus, it is assumed that approximately 70 percent of storm water runoff from the regulated urban area is collected by the municipal separate storm sewer systems.

CAFOs are located within the Ocmulgee River Basin (see Section 3.1.3). These facilities are either included under an LAS General Permit or an NPDES General Permit. A small number have an individual NPDES permit. However, presently no CAFOs discharge wastewater, and therefore, they were not provided a WLA.

This TMDL will use a phased approach. Future phases of TMDL development will attempt to further define the sources of pollutants and the portion that enters the permitted storm sewer systems. As more information is collected and these TMDLs are implemented, it will become clearer as to which BMPs are needed and how the water quality standards can be achieved.

## 5.2 Load Allocations

The load allocation is the portion of the receiving water's loading capacity that is attributed to existing or future nonpoint sources or to natural background sources. Nonpoint sources are identified in 40 CFR 130.6 as follows:

- Residual waste;
- Land disposal;
- Agricultural and silvicultural;
- Mines;
- Construction;
- Saltwater intrusion; and
- Urban storm water (non-permitted).

The LA is calculated as the remaining portion of the TMDL load available, after allocating the WLA and the MOS, using the following equation:

$$\Sigma LA = TMDL - (\Sigma WLA + \Sigma WLAsw + \Sigma MOS)$$

As described above, there are two types of load allocations: loads to the stream independent of precipitation, including sources such as failing septic systems, leachate from landfills, animals in the stream, and leaking sewer system collection lines, or background loads; and loads associated with fecal coliform accumulation on land surfaces that is washed off during storm events, including runoff from saturated LAS fields. At this time, it is not possible to partition the various sources of load allocations. Table 17 presents the total load allocation expressed as counts per 30 days, or as winter instantaneous maximum counts for the 303(d) listed streams located in the Ocmulgee River Basin for the current critical condition. In the future, after additional data has been collected, it may be possible to partition the load allocation by source.

## 5.3 Seasonal Variation

The Georgia fecal coliform criteria are seasonal. One set of criteria applies to the summer season, while a different set applies to the winter season. To account for seasonal variations, the critical loads for each listed segment were determined from sampling data obtained during both summer and winter seasons, when possible. However, in some cases, the available data was limited to a single season for the calculation of the critical load. The TMDL and percent reduction given in Table 17 for each listed segment was based on the season in which the critical load occurred. The TMDLs for each season, for any given flow, are presented as equations in Section 5.5.

Analyses of the available fecal coliform data and corresponding flows were performed to determine if the fecal coliform violations occurred during wet weather (high flow) or dry weather (low flow) conditions. The flow data from each sampling site were normalized by dividing the measured flow by the product of the average annual runoff (cfs/sq mile), published in Open-File Report 82-577, and the appropriate drainage area (Carter, 1982). Plots of the normalized flows ($Q/Q_o$) versus fecal coliform are shown in Appendix B. The plots do not show a consistent relationship between fecal coliform concentrations and flow. The summer and winter plots show that the fecal coliform violations occur during both high (wet weather) and low (dry weather) flow conditions.

## 5.4 Margin of Safety

The MOS is a required component of TMDL development. There are two basic methods for incorporating the MOS: 1) implicitly incorporate the MOS using conservative modeling assumptions to develop allocations; or 2) explicitly specify a portion of the TMDL as the MOS and use the remainder for allocations. For this TMDL, an explicit MOS of 10 percent of the TMDL was used. The MOS values are presented in Table 17.

## 5.5 Total Fecal Coliform Load

The fecal coliform TMDL for the listed stream segment is dependent on the time of year, the stream flow, and the applicable state water quality standard.

The total maximum daily seasonal fecal coliform loads for Georgia are given below:

$$TMDL_{summer} = 200 \text{ counts (as a 30-day geometric mean)}/100 \text{ mL} \times Q$$

$$TMDL_{winter} = 1{,}000 \text{ counts (as a 30-day geometric mean)}/100 \text{ mL} \times Q$$

$$TMDL_{winter} = 4{,}000 \text{ counts (instantaneous)} /100 \text{ mL} \times Q$$

For purposes of determining necessary load reductions required to meet the instream water quality criteria, the current critical TMDL was determined. This load is the product of the applicable seasonal fecal coliform standard and the mean flow used to calculate the current critical load. It represents the sum of the allocated loads from point and nonpoint sources located within the immediate drainage area of the listed segment, the NPDES-permitted point discharges with recorded fecal coliform violations from the nearest upstream subwatersheds, and a margin of safety (MOS). For these calculations, the fecal load contributed by each facility to the WLA was not the maximum presented in Table 16, but rather was the product of the fecal coliform permitted limit and the average monthly discharge at the time of the critical load. The current critical loads and corresponding TMDLs, WLAs (WLA and $WLA_{sw}$), LAs, MOSs, and percent load reductions for the Ocmulgee River Basin stream segments are presented in Table 17.

The relationships of the current critical loads to the TMDLs are shown graphically in Appendix A. The vertical distance between the two values represents the load reductions necessary to achieve the TMDLs. If no TMDL or Critical Load is given on the graphs in Appendix A, the TMDL given in Table 17 is based on the instantaneous maximum standard. As a consequence of the localized nature of the load evaluations, the calculated fecal coliform load reductions pertain to point and nonpoint sources occurring within the immediate drainage area of the listed segment. These current critical values represent a worst-case scenario for the limited set of data. Thus, the load reductions required are conservative estimates, and should be sufficient to prevent exceedances of the instream fecal coliform standard for a wide range of conditions.

Evaluation of the relationship between instream water quality and the potential sources of pollutant loading is an important component of TMDL development, and is the basis for later implementation of corrective measures and BMPs. For the current TMDLs, the association between fecal coliform loads and the potential sources occurring within the subwatersheds of each segment was examined on a qualitative basis.

## Table 17. Fecal Coliform Loads and Required Fecal Coliform Load Reductions

| Stream Segment | Current Load (counts/ 30 days) | TMDL Components | | | | | Percent Reduction |
|---|---|---|---|---|---|---|---|
| | | WLA (counts/ 30 days)[1] | WLAsw (counts/ 30 days) | LA (counts/ 30 days) | MOS (counts/ 30 days) | TMDL (counts/ 30 days) | |
| Alcovy River - Headwaters to Walton Co Line | 2.25E+13 | | 6.84E+12 | 1.96E+12 | 9.78E+11 | 9.78E+12 | 56 |
| Alcovy River - Cedar Creek to Bay Creek | 5.74E+13 | | 5.87E+12 | 2.33E+12 | 9.11E+11 | 9.11E+12 | 84 |
| Alcovy River - Mountain Creek to Big Flat Creek | 2.79E+13 | | 5.91E+12 | 1.03E+13 | 1.80E+12 | 1.80E+13 | 36 |
| Alligator Creek | 2.18E+12 | 2.37E+10 | | 3.11E+11 | 3.72E+10 | 3.72E+11 | 83 |
| Almand Branch | 3.94E+12 | 1.48E+11 | 2.42E+12 | 5.44E+11 | 3.46E+11 | 3.46E+12 | 12 |
| Bay Creek - Headwaters to Beaver Creek | 5.64E+11 | 2.26E+11 | | 5.21E+09 | 2.57E+10 | 2.57E+11 | 54 |
| Bay Creek - Headwaters to Alcovy River | 9.87E+12 | | 1.11E+12 | 1.05E+12 | 2.40E+11 | 2.40E+12 | 76 |
| Beaver Ruin Creek | 5.05E+13 | | 4.68E+12 | 1.34E+12 | 6.68E+11 | 6.68E+12 | 87 |
| Big Flat Creek | 1.35E+13 | 1.52E+11 | 4.65E+11 | 3.37E+12 | 4.43E+11 | 4.43E+12 | 67 |
| Big Haynes Creek - Headwaters to Brushy Creek | 6.85E+12 | | 2.13E+12 | 6.10E+11 | 3.05E+11 | 3.05E+12 | 55 |
| Big Haynes Creek - Brushy Creek to Little Panther Creek | 1.21E+13 | | 5.04E+12 | 2.08E+12 | 7.91E+11 | 7.91E+12 | 35 |
| Big Haynes Creek - Little Haynes Creek to Yellow River | 1.17E+14 | | 2.31E+13 | 4.00E+13 | 7.01E+12 | 7.01E+13 | 40 |
| ig Indian Creek | 3.14E+14 | 9.19E+11 | 5.15E+12 | 1.60E+14 | 1.84E+13 | 1.84E+14 | 41 |
| Big Sandy Creek | 2.86E+12 | | | 2.48E+12 | 2.76E+11 | 2.76E+12 | 4 |
| Bromolow Creek | 3.75E+13 | | 7.93E+12 | 2.26E+12 | 1.13E+12 | 1.13E+13 | 70 |
| Brushy Fork Creek | 2.89E+12 | | 1.20E+12 | 5.52E+11 | 1.94E+11 | 1.94E+12 | 33 |
| Cabin Creek | 5.98E+12 | 4.84E+11 | 3.01E+11 | 1.15E+12 | 2.15E+11 | 2.15E+12 | 64 |
| Camp Creek | 1.64E+12 | | 7.51E+11 | 2.14E+11 | 1.07E+11 | 1.07E+12 | 35 |
| Cedar Creek | 2.20E+12 | | 8.89E+11 | 2.54E+11 | 1.27E+11 | 1.27E+12 | 42 |
| Cobbs Creek | 1.80E+13 | | 1.05E+12 | 3.00E+11 | 1.50E+11 | 1.50E+12 | 92 |

| Stream Segment | Current Load (counts/ 30 days) | TMDL Components | | | | | Percent Reduction |
|---|---|---|---|---|---|---|---|
| | | WLA (counts/ 30 days)[1] | WLAsw (counts/ 30 days) | LA (counts/ 30 days) | MOS (counts/ 30 days) | TMDL (counts/ 30 days) | |
| Conley Creek | 6.89E+12 | | 1.20E+12 | 3.44E+11 | 1.72E+11 | 1.72E+12 | 75 |
| Doless Creek | 9.24E+11 | | 1.88E+10 | 5.36E+09 | 2.68E+09 | 2.68E+10 | 97 |
| Doolittle Creek | 2.25E+13 | | 8.23E+11 | 2.35E+11 | 1.18E+11 | 1.18E+12 | 95 |
| Falling Creek | 8.39E+12 | | | 6.80E+12 | 7.56E+11 | 7.56E+12 | 10 |
| Gully Creek | 2.60E+11 | | | 1.25E+11 | 1.39E+10 | 1.39E+11 | 46 |
| Honey Creek | 2.45E+13 | | 1.69E+12 | 1.02E+12 | 3.01E+11 | 3.01E+12 | 88 |
| Hopkins Creek | 2.91E+12 | | 4.88E+11 | 1.40E+11 | 6.98E+10 | 6.98E+11 | 76 |
| House Creek | 2.43E+12 | | | 1.09E+12 | 1.21E+11 | 1.21E+12 | 50 |
| Intrenchment Creek | 3.52E+12 | | 1.19E+12 | 3.39E+11 | 1.69E+11 | 1.69E+12 | 52 |
| Jacks Creek | 2.27E+12 | | 9.20E+11 | 2.63E+11 | 1.31E+11 | 1.31E+12 | 20 |
| Jackson Creek | 2.43E+13 | 6.37E+11 | 4.27E+12 | 5.82E+11 | 6.09E+11 | 6.09E+12 | 75 |
| Little Haynes Creek | 9.32E+12 | | 9.20E+11 | 4.01E+12 | 5.47E+11 | 5.47E+12 | 41 |
| Little Stone Mountain | 1.14E+12 | | 3.68E+11 | 1.05E+11 | 5.26E+10 | 5.26E+11 | 54 |
| Little Suwannee Creek | 5.71E+12 | | 1.63E+12 | 4.66E+11 | 2.33E+11 | 2.33E+12 | 59 |
| McClain Branch | 1.60E+12 | 6.83E+10 | 6.13E+11 | 1.07E+11 | 8.76E+10 | 8.76E+11 | 45 |
| Mosquito Creek | 3.53E+12 | | | 1.34E+12 | 1.49E+11 | 1.49E+12 | 58 |
| No Business Creek | 2.28E+12 | 2.05E+11 | 1.05E+12 | 9.47E+10 | 1.50E+11 | 1.50E+12 | 34 |
| North Branch South River | No Data | | | | No Data | No Data | No Data |
| Ocmulgee River | 4.55E+14 | | 4.05E+13 | 2.66E+14 | 3.41E+13 | 3.41E+14 | 25 |
| Pew Creek | 3.58E+12 | | 1.40E+12 | 4.00E+11 | 2.00E+11 | 2.00E+12 | 3 |
| Rocky Creek | 1.48E+12 | | 4.66E+11 | 2.74E+11 | 8.22E+10 | 8.22E+11 | 44 |
| Rum Creek | 2.29E+14 | | | 3.44E+13 | 3.82E+12 | 3.82E+13 | 83 |

| Stream Segment | Current Load (counts/ 30 days) | TMDL Components | | | | | Percent Reduction |
|---|---|---|---|---|---|---|---|
| | | WLA (counts/ 30 days)[1] | WLAsw (counts/ 30 days) | LA (counts/ 30 days) | MOS (counts/ 30 days) | TMDL (counts/ 30 days) | |
| Shetley Creek | 9.89E+11 | | 2.48E+11 | 7.08E+10 | 3.54E+10 | 3.54E+11 | 64 |
| Shoal Creek - Headwaters to Alcovy River, Lawrenceville | 6.50E+12 | | 8.55E+11 | 2.44E+11 | 1.22E+11 | 1.22E+12 | 81 |
| Shoal Creek - Headwaters to South River | 6.13E+12 | | 8.73E+11 | 2.49E+11 | 1.25E+11 | 1.25E+12 | 80 |
| Snapfinger Creek | 7.16E+13 | | 4.03E+12 | 1.15E+12 | 5.76E+11 | 5.76E+12 | 92 |
| Snapping Shoals Creek | 8.75E+12 | 4.78E+10 | 9.12E+11 | 2.82E+12 | 4.20E+11 | 4.20E+12 | 52 |
| South River - Atlanta to Flakes Mill Road | 6.00E+14 | | 1.07E+13 | 3.05E+12 | 1.52E+12 | 1.52E+13 | 97 |
| South River - Flakes Mill Road to Pole Bridge Creek | 1.81E+14 | 5.97E+12 | 1.29E+13 | 6.42E+11 | 2.17E+12 | 2.17E+13 | 88 |
| South River - Pole Bridge Creek to Hwy 20 | 3.12E+14 | 2.66E+12 | 3.11E+13 | 1.38E+13 | 5.29E+12 | 5.29E+13 | 83 |
| South River - Hwy 20 to Snapping Shoals Creek | 7.96E+13 | | 2.54E+13 | 1.93E+13 | 4.97E+12 | 4.97E+13 | 38 |
| South River - Snapping Shoals to Jackson Lake | 2.63E+15 | | 1.93E+14 | 1.72E+14 | 4.06E+13 | 4.06E+14 | 85 |
| Stone Mountain Creek | 1.01E+12 | | 5.94E+11 | 1.70E+11 | 8.49E+10 | 8.49E+11 | 16 |
| Sugar Creek - u/s Memorial Drive to South River | 4.22E+12 | | 6.92E+11 | 1.98E+11 | 9.89E+10 | 9.89E+11 | 77 |
| Sugar Creek - Turnpike Creek to Little Ocmulgee River | 1.07E+14 | | | 9.14E+13 | 1.02E+13 | 1.02E+14 | 5 |
| Sweetwater Creek | 3.12E+13 | 6.37E+11 | 8.84E+12 | 1.89E+12 | 1.26E+12 | 1.26E+13 | 60 |
| Swift Creek | 3.77E+13 | | 1.40E+13 | 4.00E+12 | 2.00E+12 | 2.00E+13 | 47 |
| Tobesofkee Creek - Barnesville to Cole Creek | 6.20E+13 | 1.75E+11 | | 1.34E+12 | 1.68E+11 | 1.68E+12 | 97 |
| Tobesofkee Creek - Cole Creek to Todd Creek | 6.53E+12 | | | 1.73E+12 | 1.93E+11 | 1.93E+12 | 70 |
| Tobesofkee Creek - Lake Tobesofkee to Rocky Creek | 8.67E+13 | | 1.41E+13 | 4.04E+12 | 2.02E+12 | 2.02E+13 | 77 |
| Towaliga River | 2.34E+13 | | 4.62E+11 | 8.03E+12 | 9.44E+11 | 9.44E+12 | 60 |
| Town Branch | 3.88E+11 | 2.82E+10 | | 1.60E+11 | 2.09E+10 | 2.09E+11 | 46 |
| Turkey Creek | 1.00E+12 | | 2.64E+11 | 7.55E+10 | 3.77E+10 | 3.77E+11 | 62 |
| Turnpike Creek | 7.09E+13 | | | 3.99E+13 | 4.43E+12 | 4.43E+13 | 38 |

| Stream Segment | Current Load (counts/ 30 days) | TMDL Components | | | | | Percent Reduction |
|---|---|---|---|---|---|---|---|
| | | WLA (counts/ 30 days)[1] | WLAsw (counts/ 30 days) | LA (counts/ 30 days) | MOS (counts/ 30 days) | TMDL (counts/ 30 days) | |
| Tussahaw Creek | 5.97E+13 | | 6.20E+10 | 7.91E+12 | 8.86E+11 | 8.86E+12 | 85 |
| Walnut Creek | 1.47E+13 | 1.93E+11 | 3.14E+11 | 3.16E+12 | 4.07E+11 | 4.07E+12 | 72 |
| Watson Creek | 1.24E+12 | | 6.53E+11 | 1.87E+11 | 9.33E+10 | 9.33E+11 | 25 |
| Wise Creek | 3.40E+12 | | | 2.85E+12 | 3.16E+11 | 3.16E+12 | 7 |
| Yellow River - Headwaters to Harris Lake | 2.85E+13 | | 1.54E+12 | 4.41E+11 | 2.20E+11 | 2.20E+12 | 92 |
| Yellow River - Harris Lake to Pew Creek | 3.11E+13 | | 8.19E+12 | 2.34E+12 | 1.17E+12 | 1.17E+13 | 62 |
| Yellow River - Sweetwater Creek to Centerville Creek | 7.97E+13 | 1.77E+12 | 2.83E+13 | 6.30E+12 | 4.04E+12 | 4.04E+13 | 49 |
| Yellow River - Centerville Creek to Hammock Creek | 4.52E+13 | | 1.54E+13 | 1.13E+13 | 2.97E+12 | 2.97E+13 | 34 |
| Yellow River - Hammock Creek to Big Haynes Creek | 1.04E+14 | 1.06E+12 | 2.03E+13 | 1.54E+13 | 4.09E+12 | 4.09E+13 | 61 |
| Yellow River - Big Haynes Creek to Jackson Lake | 3.54E+14 | | 4.12E+13 | 5.51E+13 | 1.07E+13 | 1.07E+14 | 70 |

Notes: [1] The assigned fecal coliform load from each NPDES permitted facility for WLA was determined as the product of the fecal coliform permit limit and the facility average monthly discharge at the time of the critical load.

# 6.0 RECOMMENDATIONS

The TMDL process consists of an evaluation of the 303(d) listed stream segments' subwatersheds to identify, as best as possible, the sources of the fecal coliform loads causing the stream to exceed instream standards. The TMDL analysis was performed using the best available data to specify WLAs and LAs that will meet fecal coliform water quality criteria so as to support the use classification specified for each listed segment.

This TMDL represents part of a long-term process to reduce fecal coliform loading to meet water quality standards in the Ocmulgee River Basin. Implementation strategies will be reviewed and the TMDLs will be refined as necessary in the next phase (next five-year cycle). The phased approach will support progress toward water quality standards attainment in the future. In accordance with USEPA TMDL guidance, these TMDLs may be revised based on the results of future monitoring and source characterization data efforts. The following recommendations emphasize further source identification and involve the collection of data to support the current allocations and subsequent source reductions.

## 6.1 Monitoring

Water quality monitoring is conducted at a number of locations across the state each year. The GA EPD has adopted a basin approach to water quality management that divides Georgia's major river basins into five groups. This approach provides for additional sampling work to be focused on one of the five basin groups each year and offers a five-year planning and assessment cycle. The Ocmulgee, Oconee, and Altamaha River Basins were the subjects of focused monitoring in 2004 and will again receive focused monitoring in 2009.

The TMDL Implementation Plan will outline an appropriate water quality monitoring program for the listed streams in the Ocmulgee River Basin. The monitoring program will be developed to help identify the various fecal coliform sources. The monitoring program may be used to verify the 303(d) stream segment listings. This will be especially valuable for those segments where no data, old data, or spill data resulted in the listing.

## 6.2 Fecal Coliform Management Practices

Based on the findings of the source assessment, NPDES point source fecal coliform loads from wastewater treatment facilities do not significantly contribute to the impairment of the listed stream segments. This is because most facilities are required to treat to levels corresponding to instream water quality criteria. Fecal coliform loads from NPDES permitted MS4 areas may be significant, but these sources cannot be easily segregated from other storm water runoff. Other sources of fecal coliform in urban areas include wastes that are attributable to domestic animals, leaks and overflows from sanitary sewer systems, illicit discharges of sanitary waste, leaking septic systems, runoff from improper disposal of waste materials, and leachate from both operational and closed landfills. In agricultural areas, potential sources of fecal coliform may include CAFOs, animals grazing in pastures, dry manure storage facilities and lagoons, chicken litter storage areas, and direct access of livestock to streams. Wildlife, especially waterfowl can be a significant source of fecal coliform bacteria.

Management practices are recommended to reduce fecal coliform source loads to the listed 303(d) stream segments, with the result of achieving the instream fecal coliform standard criteria. These recommended management practices include:

- Compliance with NPDES permit limits and requirements;
- Adoption of NRCS Conservation Practices; and
- Application of Best Management Practices (BMPs) appropriate to agricultural or urban land uses, where applicable.

### 6.2.1 Point Source Approaches

Point sources are defined as discharges of treated wastewater or storm water into rivers and streams at discrete locations. The NPDES permit program provides a basis for municipal, industrial and storm water permits, monitoring and compliance with limitations, and appropriate enforcement actions for violations.

In accordance with GA EPD rules and regulations, all discharges from point source facilities are required to be in compliance with the conditions of their NPDES permit at all times. In the future, all municipal and industrial wastewater treatment facilities with the potential for the occurrence of fecal coliform in their discharge will be given end-of-pipe limits equivalent to the water quality standard of 200 counts/100 mL. An exception is constructed wetland systems, which have a natural level of fecal coliform input from animals attracted to the artificial wetlands. In addition, the permits will include routine monitoring and reporting requirements.

### 6.2.2 Nonpoint Source Approaches

The GA EPD is responsible for administering and enforcing laws to protect the waters of the State. The GA EPD is the lead agency for implementing the State's Nonpoint Source Management Program. Regulatory responsibilities that have a bearing on nonpoint source pollution include establishing water quality standards and use classifications, assessing and reporting water quality conditions, and regulating land use activities that may affect water quality. Georgia is working with local governments, agricultural and forestry agencies such as the Natural Resources Conservation Service, the Georgia Soil and Water Conservation Commission, and the Georgia Forestry Commission, to foster the implementation of BMPs to address nonpoint source pollution. In addition, public education efforts are being targeted to individual stakeholders to provide information regarding the use of BMPs to protect water quality. The following sections describe, in more detail, recommendations to reduce nonpoint source loads of fecal coliform bacteria in Georgia's surface waters.

#### 6.2.2.1 Agricultural Sources

The GA EPD should coordinate with other agencies that are responsible for agricultural activities in the state to address issues concerning fecal coliform loading from agricultural lands. It is recommended that information (e.g., livestock populations by subwatershed, animal access to streams, manure storage and application practices, etc.) be periodically reviewed so that watershed evaluations can be updated to reflect current conditions. It is also recommended that BMPs be utilized to reduce the amount of fecal coliform bacteria transported to surface waters from agricultural sources to the maximum extent practicable.

The following three organizations have primary responsibility for working with farmers to promote soil and water conservation, and to protect water quality:

- University of Georgia (UGA) - Cooperative Extension Service;
- Georgia Soil and Water Conservation Commission (GSWCC); and
- Natural Resources Conservation Service (NRCS).

UGA has faculty, County Cooperative Extension Agents, and technical specialists who provide services in several key areas relating to agricultural impacts on water quality.

The GA EPD designated the GSWCC as the lead agency for agricultural Nonpoint Source Management in the State. The GSWCC develops nonpoint source management programs and conducts educational activities to promote conservation and protection of land and water devoted to agricultural uses.

The NRCS works with federal, state, and local governments to provide financial and technical assistance to farmers. The NRCS develops standards and specifications for BMPs that are to be used to improve, protect, and/or maintain our state's natural resources. In addition, every five years, the NRCS conducts the National Resources Inventory (NRI). The NRI is a statistically based sample of land use and natural resource conditions and trends that covers non-federal land in the United States.

The NRCS is also providing technical assistance to the GSWCC and the GA EPD with the Georgia River Basin Planning Program. Planning activities associated with this program will describe conditions of the agricultural natural resource base once every five years. It is recommended that the GSWCC and the NRCS continue to encourage BMP implementation, education efforts, and river basin surveys with regard to river basin planning.

#### 6.2.2.2 Urban Sources

Both point and nonpoint sources of fecal coliform bacteria can be significant in the Ocmulgee River Basin urban areas. Urban sources of fecal coliform can best be addressed using a strategy that involves public participation and intergovernmental coordination to reduce the discharge of pollutants to the maximum extent practicable. Management practices, control techniques, public education, and other appropriate methods and provisions may be employed. In addition to water quality monitoring programs, discussed in Section 6.1, the following activities and programs conducted by cities, counties, and state agencies are recommended:

- Uphold requirements that all new and replacement sanitary sewage systems be designed to minimize discharges into storm sewer systems;

- Further develop and streamline mechanisms for reporting and correcting illicit connections, breaks, surcharges, and general sanitary sewer system problems;

- Sustained compliance with storm water NPDES permit requirements; and

- Continue efforts to increase public awareness and education towards the impact of human activities in urban settings on water quality, ranging from the consequences of industrial and municipal discharges to the activities of individuals in residential neighborhoods.

## 6.3 Reasonable Assurance

Permitted discharges will be regulated through the NPDES permitting process described in this report. Georgia is working with both federal and state agencies, such as the NRCS and the GSWCC, and with local governments, to foster the implementation of BMPs to address nonpoint sources. In addition, public education efforts will be targeted at individual stakeholders to provide information regarding the use of BMPs to protect water quality.

## 6.4 Public Participation

A thirty-day public notice was provided for this TMDL. During this time, the availability of the TMDL was public noticed, a copy of the TMDL was provided as requested, and the public was invited to provide comments on the TMDL.

## 7.0 INITIAL TMDL IMPLEMENTATION PLAN

The GA EPD has coordinated with EPA to prepare this Initial TMDL Implementation Plan for this TMDL. The GA EPD has also established a plan and schedule for development of a more comprehensive implementation plan after this TMDL is established. The GA EPD and EPA have executed a Memorandum of Understanding that documents the schedule for developing the more comprehensive plans. This Initial TMDL Implementation Plan includes a list of best management practices and provides for an initial implementation demonstration project to address one of the major sources of pollutants identified in this TMDL while State and/or local agencies work with local stakeholders to develop a revised TMDL implementation plan. It also includes a process whereby GA EPD and/or Regional Development Centers (RDCs) or other GA EPD contractors (hereinafter, "GA EPD Contractors") will develop expanded plans (hereinafter, "Revised TMDL Implementation Plans").

This Initial TMDL Implementation Plan, written by GA EPD and for which GA EPD and/or the GA EPD Contractor are responsible, contains the following elements.

1. EPA has identified a number of management strategies for the control of nonpoint sources of pollutants, representing some best management practices. The "Management Measure Selector Table" shown below identifies these management strategies by source category and pollutant. Nonpoint sources are the primary cause of excessive pollutant loading in most cases. Any wasteload allocations for wastewater treatment plant facilities will be implemented in the form of water-quality based effluent limitations in NPDES permits. Any wasteload allocations for regulated storm water will be implemented in the form of best management practices in the NPDES permits. NPDES permit discharges are a secondary source of excessive pollutant loading, where they are a factor, in most cases.

2. The GA EPD and the GA EPD Contractor will select and implement one or more best management practice (BMP) demonstration projects for each River Basin. The purpose of the demonstration projects will be to evaluate by River Basin and pollutant parameter the site-specific effectiveness of one or more of the BMPs chosen. The GA EPD intends that the BMP demonstration project be completed before the Revised TMDL Implementation Plan is issued. The BMP demonstration project will address the major pollutant categories of concern for the respective River Basin as identified in the TMDLs. The demonstration project need not be of a large scale, and may consist of one or more measures from the Table or equivalent BMP measures proposed by the GA EPD Contractor and approved by GA EPD. Other such measures may include those found in EPA's "*Best Management Practices Handbook*," the *"NRCS National Handbook of Conservation Practices*," or any similar reference, or measures that the volunteers, etc., devise that GA EPD approves. If for any reason the GA EPD Contractor does not complete the BMP demonstration project, GA EPD will take responsibility for doing so.

3. As part of the Initial TMDL Implementation Plan, the GA EPD brochure entitled *"Watershed Wisdom -- Georgia's TMDL Program*" will be distributed by GA EPD to the GA EPD Contractor for use with appropriate stakeholders for this TMDL. Also, a copy of the video of that same title will be provided to the GA EPD

Contractor for its use in making presentations to appropriate stakeholders on TMDL implementation plan development.

4. If for any reason the GA EPD Contractor does not complete one or more elements of a Revised TMDL Implementation Plan, GA EPD will be responsible for getting that (those) element(s) completed, either directly or through another contractor.

5. The deadline for development of a Revised TMDL Implementation Plan is the end of September 2009.

6. The GA EPD Contractor helping to develop the Revised TMDL Implementation Plan, in coordination with GA EPD, will work on the following tasks involved in converting the Initial TMDL Implementation Plan to a Revised TMDL Implementation Plan:

   A. Generally characterize the watershed;
   B. Identify stakeholders;
   C. Verify the present problem to the extent feasible and appropriate (e.g., local monitoring);
   D. Identify probable sources of pollutant(s);
   E. For the purpose of assisting in the implementation of the load allocations of this TMDL, identify potential regulatory or voluntary actions to control pollutant(s) from the relevant nonpoint sources;
   F. Determine measurable milestones of progress;
   G. Develop a monitoring plan, taking into account available resources, to measure effectiveness; and
   H. Complete and submit to GA EPD the Revised TMDL Implementation Plan.

7. The public will be provided an opportunity to participate in the development of the Revised TMDL Implementation Plan and to comment on it before it is finalized.

8. The Revised TMDL Implementation Plan will supersede this Initial TMDL Implementation Plan once GA EPD approves the Revised TMDL Implementation Plan.

## Management Measure Selector Table

| Land Use | Management Measures | Fecal Coliform | Dissolved Oxygen | pH | Sediment | Temperature | *Toxicity* | *Mercury* | Metals (copper, lead, zinc, cadmium) | PCBs, toxaphene |
|---|---|---|---|---|---|---|---|---|---|---|
| **Agriculture** | 1. Sediment & Erosion Control | _ | _ | | _ | _ | | | | |
| | 2. Confined Animal Facilities | _ | _ | | | | | | | |
| | 3. Nutrient Management | _ | _ | | | | | | | |
| | 4. Pesticide Management | | _ | | | | | | | |
| | 5. Livestock Grazing | _ | _ | | _ | _ | | | | |
| | 6. Irrigation | | _ | | _ | _ | | | | |
| **Forestry** | 1. Preharvest Planning | | | | _ | _ | | | | |
| | 2. Streamside Management Areas | _ | _ | | _ | _ | | | | |
| | 3. Road Construction & Reconstruction | | _ | | _ | _ | | | | |
| | 4. Road Management | | _ | | _ | _ | | | | |
| | 5. Timber Harvesting | | _ | | _ | _ | | | | |
| | 6. Site Preparation & Forest Regeneration | | _ | | _ | _ | | | | |
| | 7. Fire Management | _ | _ | _ | _ | _ | | | | |
| | 8. Revegetation of Disturbed Areas | _ | _ | _ | _ | _ | | | | |
| | 9. Forest Chemical Management | | _ | | | _ | | | | |
| | 10. Wetlands Forest Management | _ | _ | _ | | _ | | _ | | |

| Land Use | Management Measures | Fecal Coliform | Dissolved Oxygen | pH | Sediment | Temperature | *Toxicity* | *Mercury* | Metals (copper, lead, zinc, cadmium) | PCBs, toxaphene |
|---|---|---|---|---|---|---|---|---|---|---|
| **Urban** | 1. New Development | – | – | | – | – | | | – | |
| | 2. Watershed Protection & Site Development | – | – | | – | – | | – | – | |
| | 3. Construction Site Erosion and Sediment Control | | – | | – | – | | | | |
| | 4. Construction Site Chemical Control | | – | | | | | | | |
| | 5. Existing Developments | – | – | | – | – | | | – | |
| | 6. Residential and Commercial Pollution Prevention | – | – | | | | | | | |
| **Onsite Wastewater** | 1. New Onsite Wastewater Disposal Systems | – | – | | | | | | | |
| | 2. Operating Existing Onsite Wastewater Disposal Systems | – | – | | | | | | | |
| **Roads, Highways and Bridges** | 1. Siting New Roads, Highways & Bridges | – | – | | – | – | | | – | |
| | 2. Construction Projects for Roads, Highways and Bridges | | – | | – | – | | | | |
| | 3. Construction Site Chemical Control for Roads, Highways and Bridges | | – | | | | | | | |
| | 4. Operation and Maintenance-Roads, Highways and Bridges | – | – | | | – | | | – | |

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# Appendix A

## 30-day Geometric Mean Fecal Coliform Monitoring Data

**Figure A-1**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Alcovy River Headwaters to Walton Co Line, Gwinnett Co**

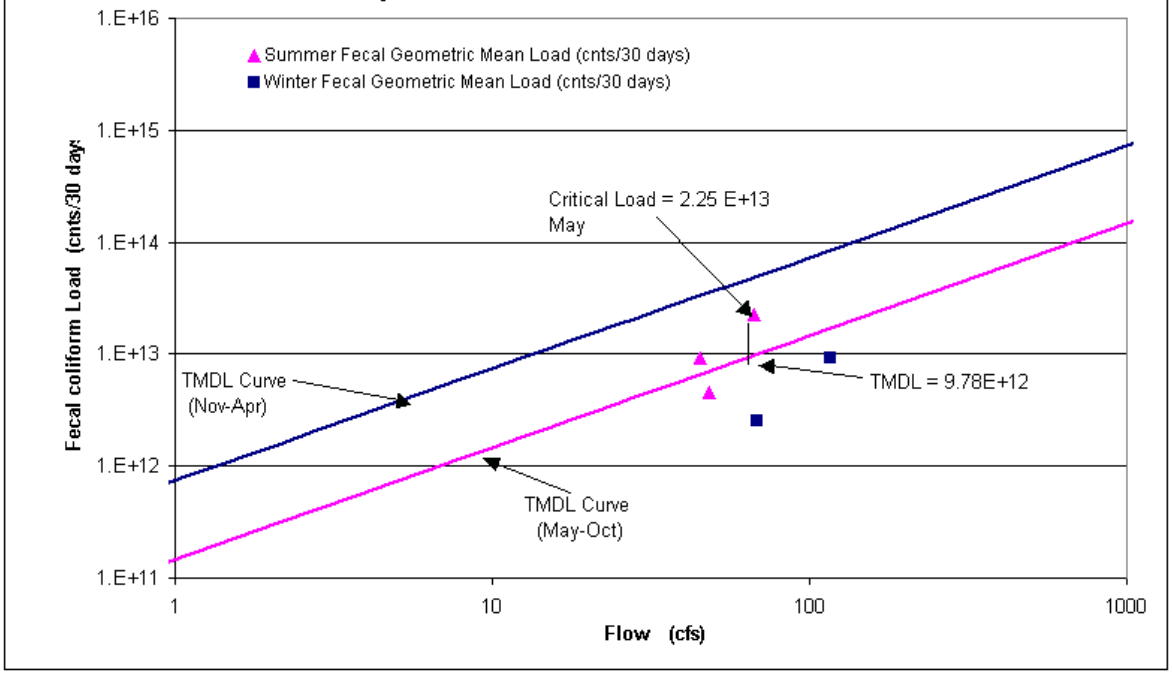



**Table A-1. Data for Figure A-1**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 4-May-04 | 320 | 79.2 | | | | |
| 11-May-04 | 187 | 25.7 | | | | |
| 18-May-04 | 480 | 42.8 | | | | |
| 25-May-04 | 210 | 33.7 | 279 | 45.3 | 9.27E+12 | 6.66E+12 |
| 5-Oct-04 | 200 | 59.6 | | | | |
| 12-Oct-04 | 133 | 44.2 | | | | |
| 19-Oct-04 | 133 | 43.1 | | | | |
| 26-Oct-04 | 73 | 45.8 | 127 | 48.2 | 4.48E+12 | 7.07E+12 |
| 4-Jan-05 | 100 | 71.2 | | | | |
| 11-Jan-05 | 53 | 63.2 | | | | |
| 18-Jan-05 | 53 | 80.3 | | | | |
| 25-Jan-05 | 23 | 59.4 | 50 | 68.5 | 2.54E+12 | 5.03E+13 |
| 5-Apr-05 | 57 | 169.8 | | | | |
| 12-Apr-05 | 147 | 121.2 | | | | |
| 19-Apr-05 | 187 | 80.9 | | | | |
| 28-Apr-05 | 93 | 91.4 | 110 | 115.8 | 9.34E+12 | 8.50E+13 |
| 10-May-05 | 4600 | 57.4 | | | | |
| 17-May-05 | 287 | 85.9 | | | | |
| 24-May-05 | 130 | 52.5 | | | | |
| 31-May-05 | 260 | 70.7 | 460 | 66.6 | 2.25E+13 | 9.78E+12 |

**Figure A-2**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02208182 Alcovy River Cedar Cr to Bay Cr, Walton Co**

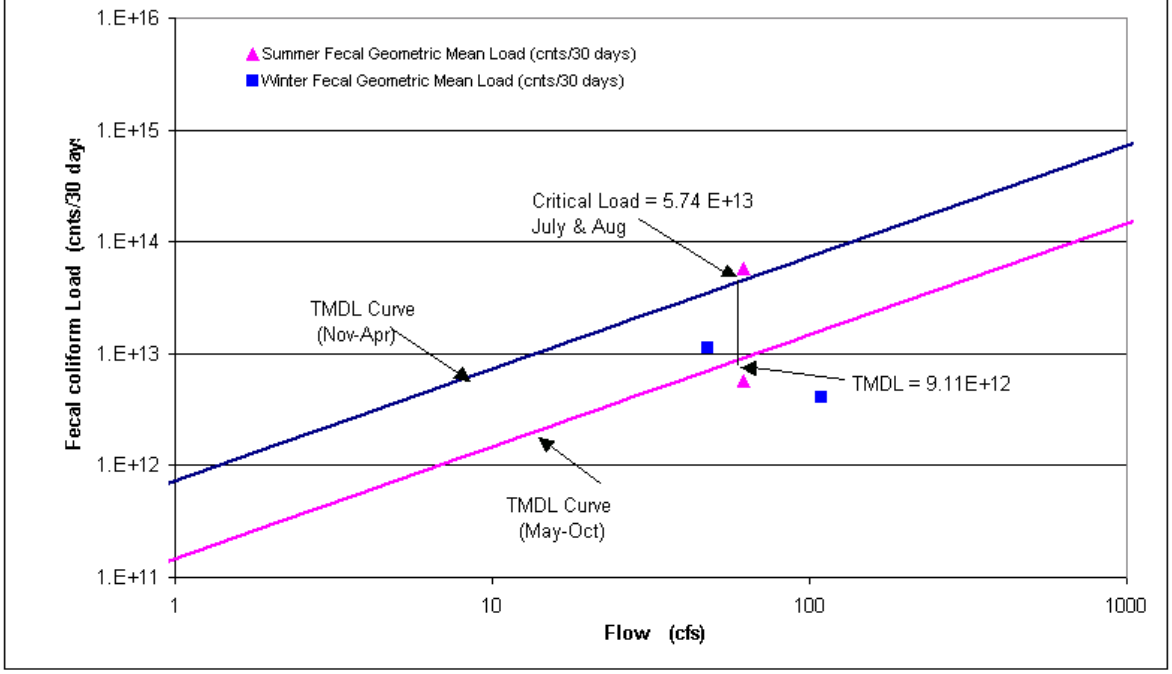



**Table A-2. Data for Figure A-2**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 13-Jan-04 | 20 | 55.0 | | | | |
| 20-Jan-04 | 40 | 63.5 | | | | |
| 28-Jan-04 | 95 | 237.8 | | | | |
| 2-Feb-04 | 90 | 79.3 | 51 | 108.9 | 4.09E+12 | 7.99E+13 |
| 13-Apr-04 | 9000 | 59.9 | | | | |
| 19-Apr-04 | 130 | 48.8 | | | | |
| 21-Apr-04 | 70 | 41.9 | | | | |
| 28-Apr-04 | 130 | 41.3 | 321 | 48.0 | 1.13E+13 | 3.52E+13 |
| 20-Jul-04 | 800 | 30.5 | | | | |
| 26-Jul-04 | 5000 | 122.8 | | | | |
| 28-Jul-04 | 9000 | 68.1 | | | | |
| 3-Aug-04 | 70 | 26.9 | 1260 | 62.1 | 5.74E+13 | 9.11E+12 |
| 18-Oct-04 | 90 | 43.9 | | | | |
| 20-Oct-04 | 1700 | 94.7 | | | | |
| 25-Oct-04 | 20 | 57.3 | | | | |
| 27-Oct-04 | 80 | 51.8 | 125 | 61.9 | 5.68E+12 | 9.09E+12 |

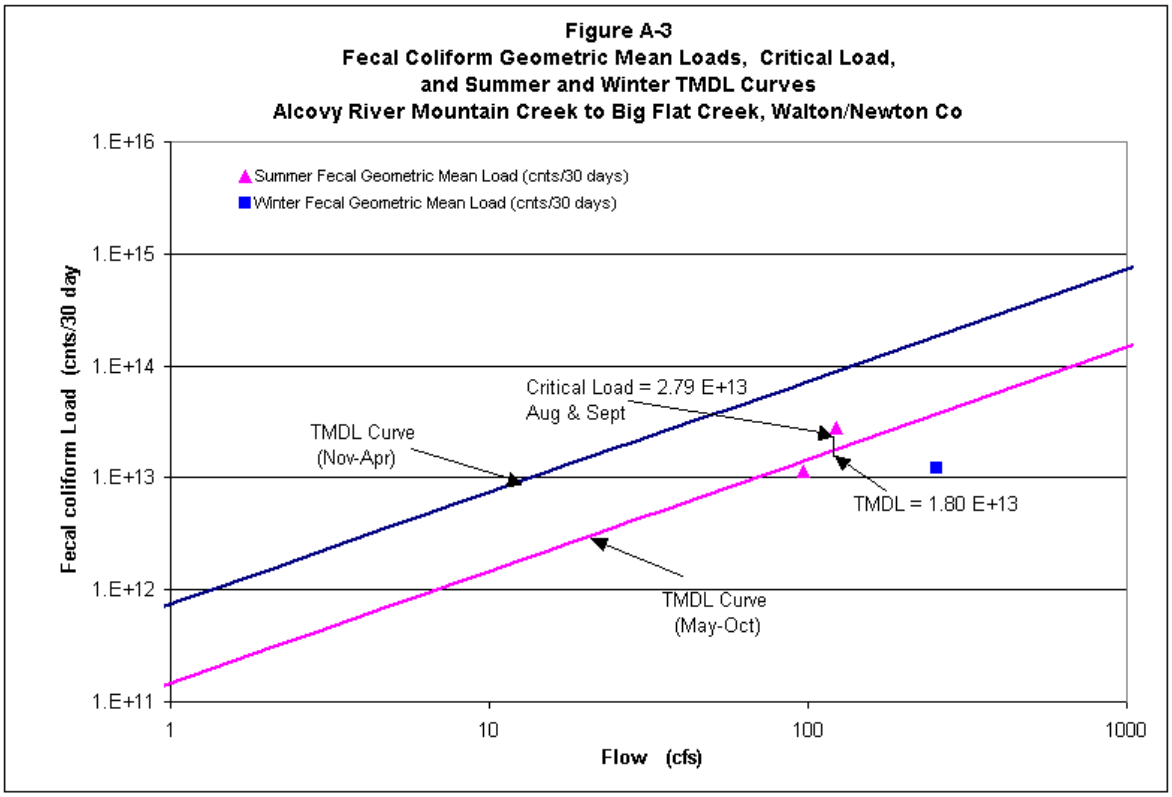



**Table A-3. Data for Figure A-3**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 18-Feb-04 | 70 | 399.8 | | | | |
| 25-Feb-04 | 40 | 218.6 | | | | |
| 3-Mar-04 | 80 | 221.7 | | | | |
| 10-Mar-04 | 80 | 174.3 | 65 | 253.6 | 1.21E+13 | 1.86E+14 |
| 19-May-04 | 270 | 159.8 | | | | |
| 26-May-04 | 130 | 78.7 | | | | |
| 7-Jun-04 | 80 | 53.5 | | | | |
| 14-Jun-04 | 230 | 94.8 | 159 | 96.7 | 1.13E+13 | 1.42E+13 |
| 18-Aug-04 | 800 | 76.4 | | | | |
| 25-Aug-04 | 300 | 49.7 | | | | |
| 1-Sep-04 | 300 | 152.9 | | | | |
| 13-Sep-04 | 130 | 210.2 | 311 | 122.3 | 2.79E+13 | 1.80E+13 |

**Figure A-4**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02216028 Alligator Creek at State Road 46 near McRae, Georgia**

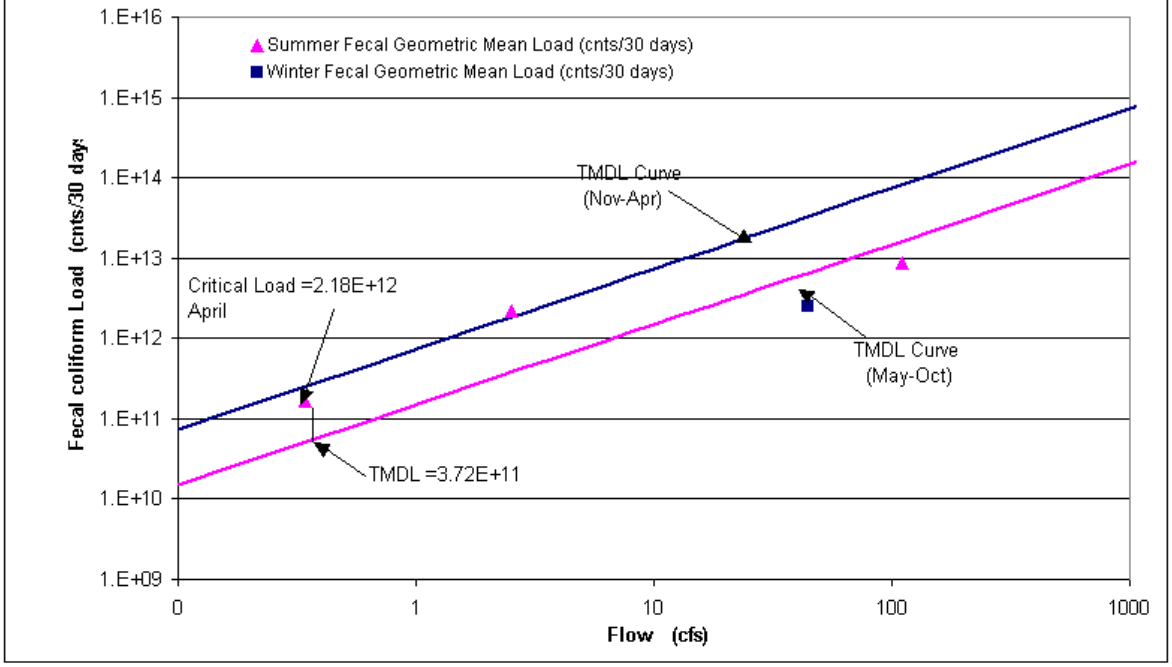



**Table A-4. Data for Figure A-4**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 22-Apr-99 | 1700 | 2.5 | | | | |
| 28-Apr-99 | 4900 | 5.2 | | | | |
| 20-May-99 | 490 | 1.9 | | | | |
| 27-May-99 | 460 | 0.5 | 1171 | 2.5 | 2.18E+12 | 3.72E+11 |
| 10-Jun-99 | 490 | 0.0 | | | | |
| 17-Jun-99 | 1700 | 0.0 | | | | |
| 29-Jul-99 | 490 | 1.3 | | | | |
| 12-Aug-99 | 490 | 0.0 | 669 | 0.3 | 1.68E+11 | 5.03E+10 |
| 18-Feb-04 | 130 | 127.0 | | | | |
| 2-Mar-04 | 170 | 10.0 | | | | |
| 9-Mar-04 | 80 | 26.0 | | | | |
| 16-Mar-04 | 20 | 14.0 | 77 | 44.3 | 2.50E+12 | 3.25E+13 |
| 14-Sep-04 | 170 | 56.0 | | | | |
| 23-Sep-04 | 130 | 10.0 | | | | |
| 30-Sep-04 | 40 | 326.0 | | | | |
| 5-Oct-04 | 140 | 51.0 | 105 | 110.8 | 8.57E+12 | 1.63E+13 |

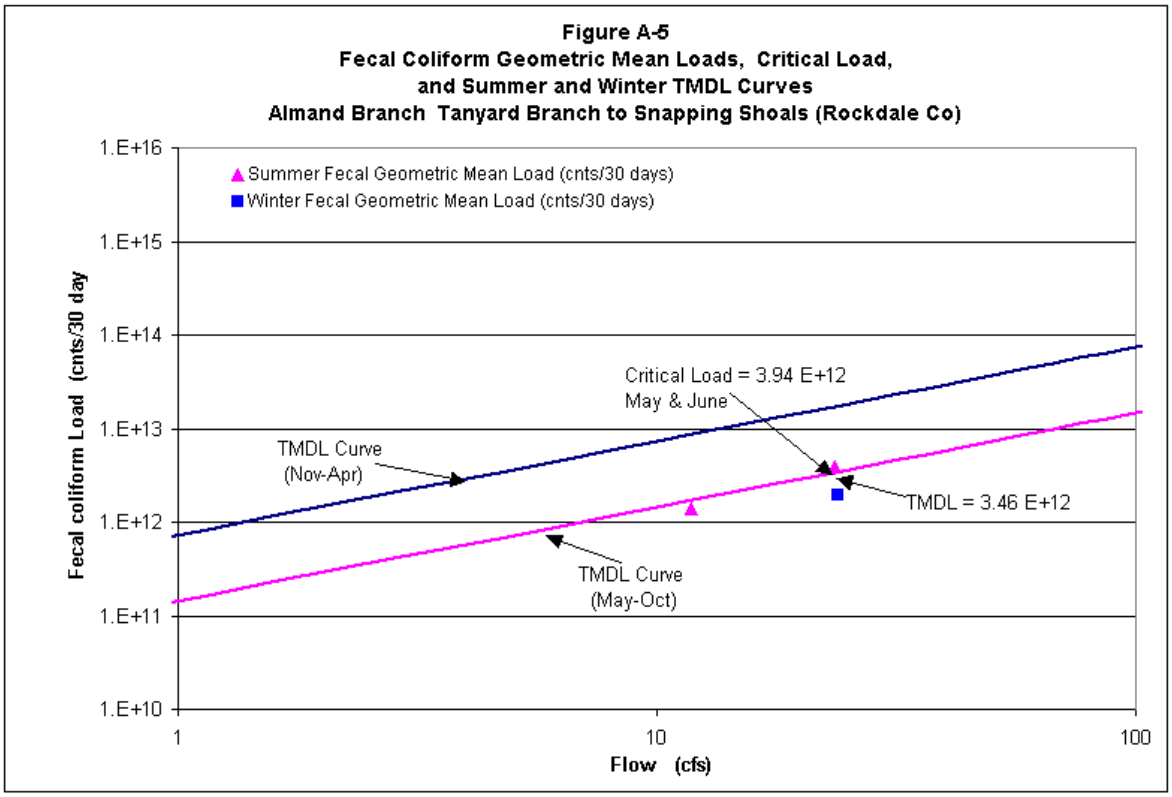



**Table A-5. Data for Figure A-5**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 17-Feb-04 | 300 | 34.0 | | | | |
| 24-Feb-04 | 80 | 21.7 | | | | |
| 2-Mar-04 | 80 | 21.0 | | | | |
| 9-Mar-04 | 80 | 18.9 | 111 | 23.9 | 1.95E+12 | 1.75E+13 |
| 18-May-04 | 300 | 20.9 | | | | |
| 2-Jun-04 | 80 | 13.9 | | | | |
| 9-Jun-04 | 800 | 13.5 | | | | |
| 16-Jun-04 | 140 | 45.9 | 228 | 23.6 | 3.94E+12 | 3.46E+12 |
| 17-Aug-04 | 80 | 13.0 | | | | |
| 24-Aug-04 | 230 | 11.4 | | | | |
| 31-Aug-04 | 220 | 10.9 | 159 | 11.8 | 1.38E+12 | 1.73E+12 |

**Figure A-6**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02214472 Bay Creek at State Road 96 near Fort Valley, Georgia**

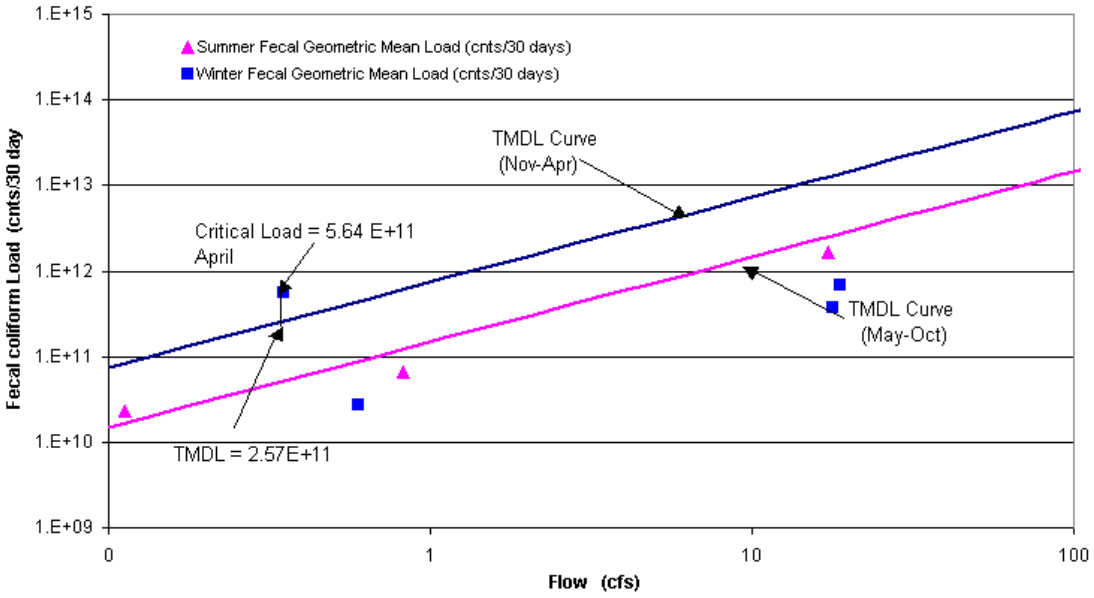



**Table A-6. Data for Figure A-6**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 19-Jan-99 | 170 | 0.7 | | | | |
| 27-Jan-99 | 20 | 0.8 | | | | |
| 2-Feb-99 | 50 | 0.5 | | | | |
| 18-Feb-99 | 80 | 0.4 | 61 | 0.6 | 2.67E+10 | 4.40E+11 |
| 1-Apr-99 | 1700 | 0.4 | | | | |
| 14-Apr-99 | 1700 | 0.3 | | | | |
| 21-Apr-99 | 3500 | 0.4 | | | | |
| 28-Apr-99 | 2300 | 0.3 | 2196 | 0.4 | 5.64E+11 | 2.57E+11 |
| 23-Jun-99 | 2300 | 0.3 | | | | |
| 30-Jun-99 | 1700 | 0.1 | | | | |
| 14-Jul-99 | 20 | 0.1 | | | | |
| 21-Jul-99 | 80 | 0.1 | 281 | 0.1 | 2.32E+10 | 1.65E+10 |
| 22-Sep-99 | 70 | 0.6 | | | | |
| 29-Sep-99 | 50 | 0.5 | | | | |
| 5-Oct-99 | 170 | 0.6 | | | | |
| 20-Oct-99 | 230 | 1.6 | 108 | 0.8 | 6.55E+10 | 1.21E+11 |
| 18-Feb-04 | 20 | 18.0 | | | | |
| 2-Mar-04 | 20 | 17.0 | | | | |
| 9-Mar-04 | 20 | 18.0 | | | | |
| 16-Mar-04 | 80 | 18.0 | 28 | 17.8 | 3.69E+11 | 1.30E+13 |
| 14-Sep-04 | 130 | 17.0 | | | | |
| 23-Sep-04 | 130 | 17.0 | | | | |
| 30-Sep-04 | 230 | 17.0 | | | | |
| 5-Oct-04 | 80 | 18.0 | 133 | 17.3 | 1.68E+12 | 2.53E+12 |
| 2-Nov-04 | 110 | 19.0 | | | | |
| 9-Nov-04 | 40 | 19.0 | | | | |
| 15-Nov-04 | 70 | 19.0 | | | | |
| 17-Nov-04 | 20 | 18.0 | 50 | 18.8 | 6.86E+11 | 1.38E+13 |

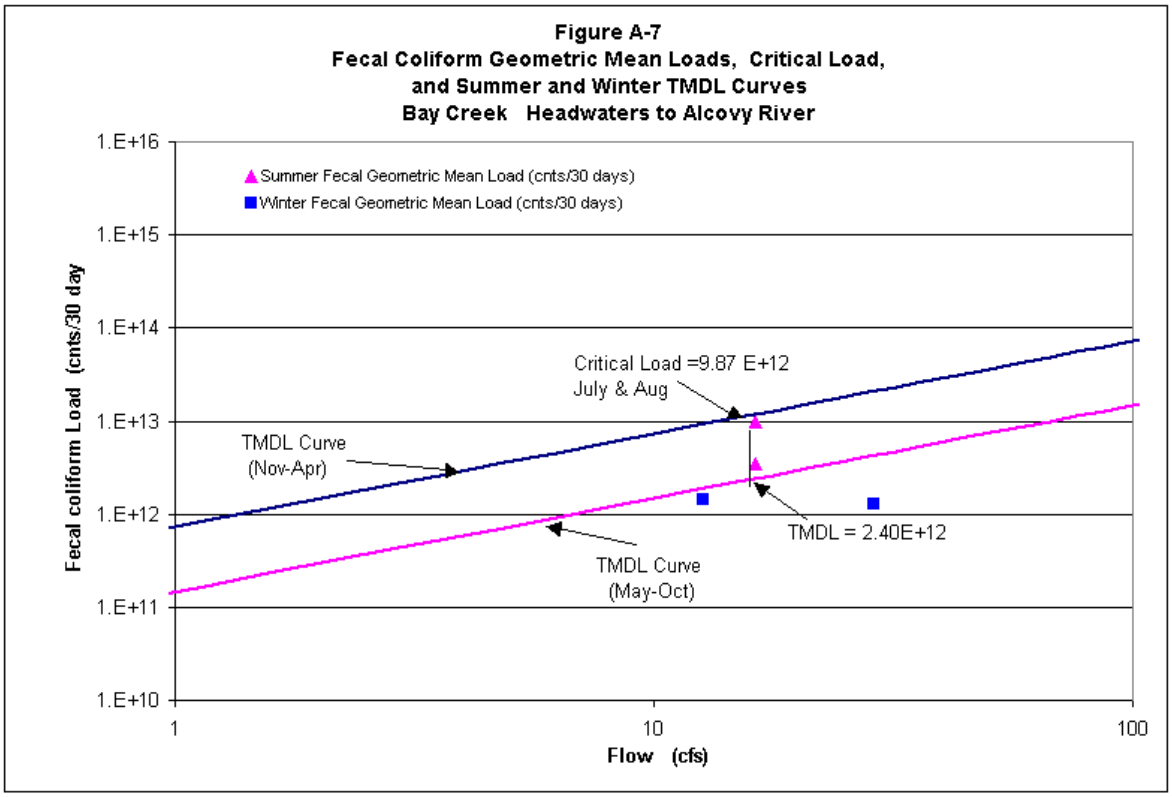



**Table A-7. Data for Figure A-7**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 13-Jan-04 | 110 | 14.5 | | | | |
| 20-Jan-04 | 80 | 16.7 | | | | |
| 28-Jan-04 | 20 | 62.7 | | | | |
| 2-Feb-04 | 80 | 20.9 | 61 | 28.7 | 1.29E+12 | 2.11E+13 |
| 13-Apr-04 | 1300 | 15.8 | | | | |
| 19-Apr-04 | 40 | 12.9 | | | | |
| 21-Apr-04 | 130 | 11.0 | | | | |
| 28-Apr-04 | 80 | 10.9 | 152 | 12.6 | 1.42E+12 | 9.28E+12 |
| 20-Jul-04 | 1300 | 8.0 | | | | |
| 26-Jul-04 | 9000 | 32.4 | | | | |
| 28-Jul-04 | 170 | 18.0 | | | | |
| 3-Aug-04 | 230 | 7.1 | 822 | 16.4 | 9.87E+12 | 2.40E+12 |
| 18-Oct-04 | 80 | 11.6 | | | | |
| 20-Oct-04 | 3000 | 24.9 | | | | |
| 25-Oct-04 | 170 | 15.1 | | | | |
| 27-Oct-04 | 170 | 13.6 | 289 | 16.3 | 3.46E+12 | 2.40E+12 |

**Figure A-8**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Beaver Ruin Creek Hillcrest Road Gwinnett County**

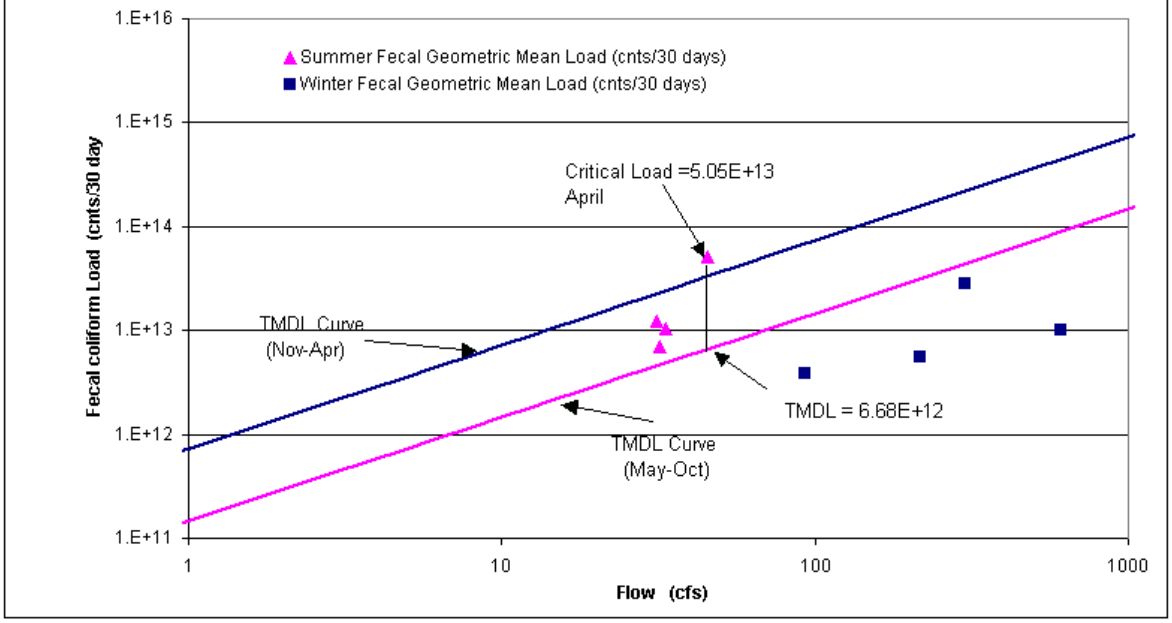



**Table A-8. Data for Figure A-8**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 13-Jan-04 | 300 | 17.5 | | | | |
| 20-Jan-04 | 700 | 17.9 | | | | |
| 28-Jan-04 | 500 | 29.5 | | | | |
| 2-Feb-04 | 1300 | 24.4 | 608 | 22.3 | 9.95E+12 | 1.64E+13 |
| 13-Apr-04 | 200 | 92.2 | | | | |
| 19-Apr-04 | 800 | 16.2 | | | | |
| 21-Apr-04 | 80 | 15.1 | | | | |
| 28-Apr-04 | 170 | 16.1 | 216 | 34.9 | 5.53E+12 | 2.56E+13 |
| 20-Jul-04 | 24192 | 13.2 | | | | |
| 26-Jul-04 | 866 | 107.7 | | | | |
| 28-Jul-04 | 500 | 42.5 | | | | |
| 3-Aug-04 | 500 | 18.6 | 1513 | 45.5 | 5.05E+13 | 6.68E+12 |
| Sep-04 | 500 | 17.2 | | | | |
| Sep-04 | 70 | 61.7 | | | | |
| Sep-04 | 300 | 13.8 | | | | |
| Sep-04 | 3000 | 41.2 | 421 | 33.5 | 1.03E+13 | 4.91E+12 |
| 18-Oct-04 | 130 | 13.9 | | | | |
| 20-Oct-04 | 500 | 80.9 | | | | |
| 25-Oct-04 | 500 | 16.0 | | | | |
| 27-Oct-04 | 2400 | 14.4 | 528 | 31.3 | 1.21E+13 | 4.60E+12 |
| Jan-05 | 130 | 21.6 | | | | |
| Jan-05 | 90 | 25.6 | | | | |
| Jan-05 | 80 | 141.4 | | | | |
| Jan-05 | 80 | 34.0 | 93 | 55.7 | 3.80E+12 | 4.09E+13 |
| Apr-05 | 110 | 308.4 | | | | |
| Apr-05 | 300 | 62.3 | | | | |
| Apr-05 | 500 | 26.8 | | | | |
| Apr-05 | 500 | 119.5 | 301 | 129.3 | 2.86E+13 | 9.49E+13 |
| Jun-05 | 500 | 63.9 | | | | |
| Jun-05 | 230 | 24.8 | | | | |
| Jun-05 | 220 | 23.0 | | | | |
| Jun-05 | 300 | 15.9 | 295 | 31.9 | 6.91E+12 | 4.68E+12 |

**Figure A-9**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Big Flat Creek Headwaters to Flat Creek (Walton Co)**

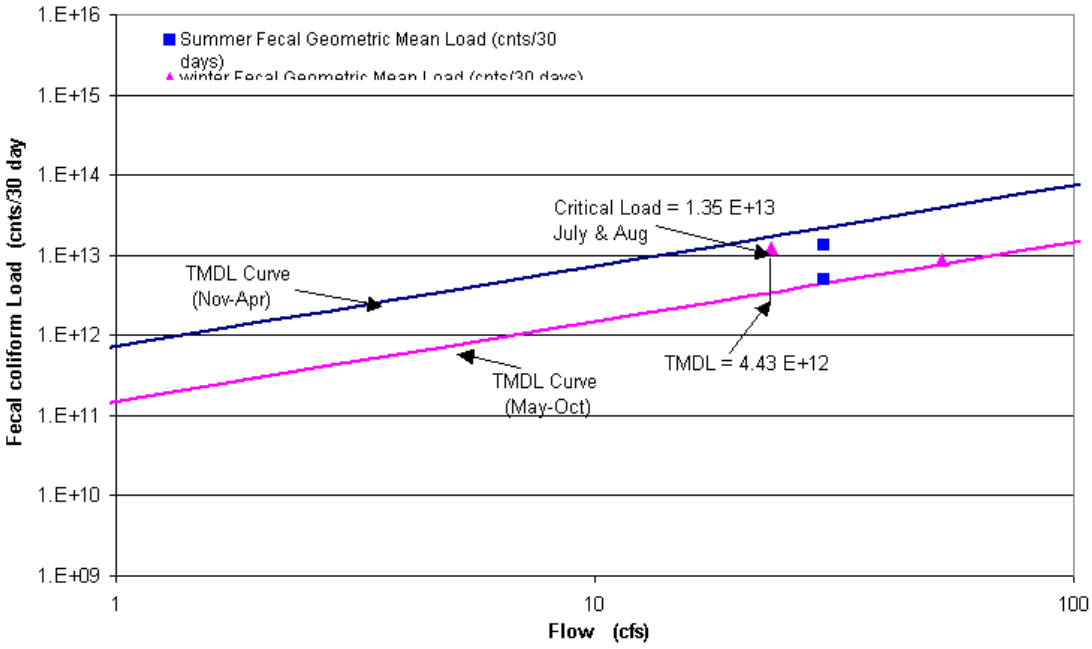



**Table A-9. Data for Figure A-9**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| #REF! | 85 | 26.7 | | | | |
| 13-Jan-04 | 220 | 30.9 | | | | |
| 20-Jan-04 | 130 | 115.6 | | | | |
| 28-Jan-04 | 1100 | 38.5 | 227 | 52.9 | 8.83E+12 | 3.89E+13 |
| 2-Feb-04 | 2700 | 29.1 | | | | |
| 13-Apr-04 | 175 | 23.7 | | | | |
| 19-Apr-04 | 365 | 20.4 | | | | |
| 28-Apr-04 | 1550 | 20.1 | 719 | 23.3 | 1.23E+13 | 1.71E+13 |
| 20-Jul-04 | 190 | 14.8 | | | | |
| 26-Jul-04 | 7000 | 59.7 | | | | |
| 28-Jul-04 | 285 | 33.1 | | | | |
| 3-Aug-04 | 365 | 13.1 | 610 | 30.2 | 1.35E+13 | 4.43E+12 |
| 18-Oct-04 | 80 | 21.3 | | | | |
| 20-Oct-04 | 1250 | 46.0 | | | | |
| 25-Oct-04 | 150 | 27.9 | | | | |
| 27-Oct-04 | 170 | 25.2 | 225 | 30.1 | 4.96E+12 | 4.42E+12 |

**Figure A-10**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Big Haynes Creek - Headwaters to Brushy Creek**

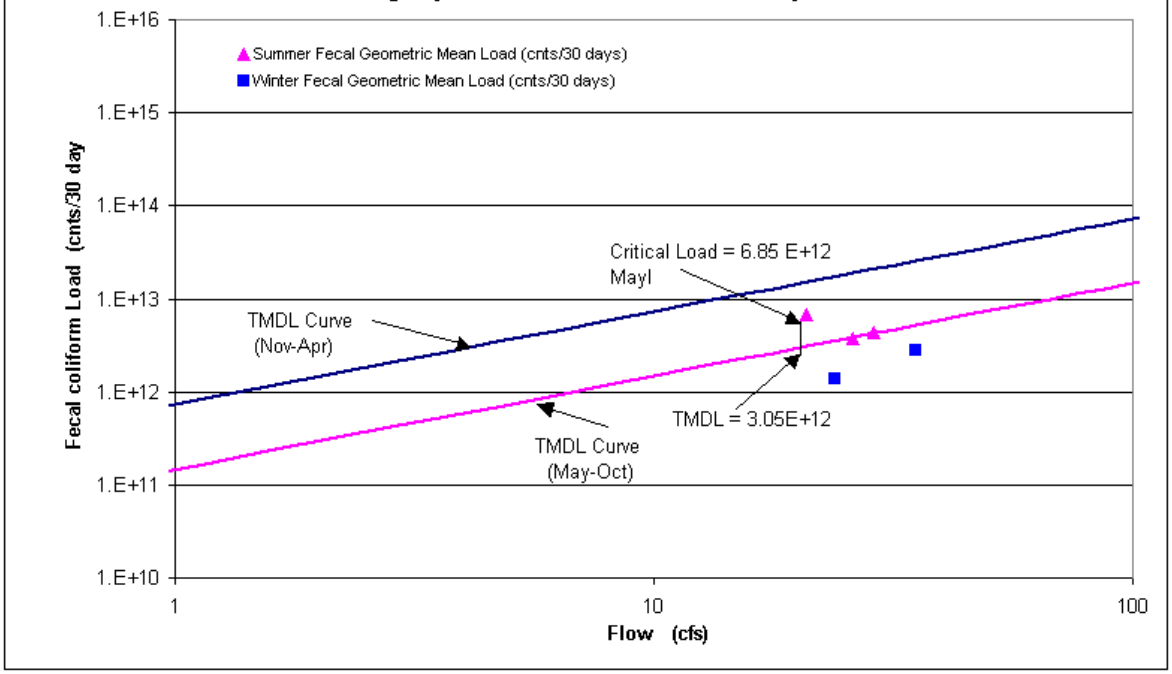



**Table A-10. Data for Figure A-10**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 4-May-04 | 533 | 22.4 | | | | |
| 11-May-04 | 507 | 19.5 | | | | |
| 18-May-04 | 387 | 25.3 | | | | |
| 25-May-04 | 390 | 15.7 | 449 | 20.8 | 6.85E+12 | 3.05E+12 |
| 5-Oct-04 | 540 | 29.0 | | | | |
| 12-Oct-04 | 200 | 18.9 | | | | |
| 19-Oct-04 | 107 | 49.7 | | | | |
| 26-Oct-04 | 147 | 17.6 | 203 | 28.8 | 4.29E+12 | 4.23E+12 |
| 4-Jan-05 | 67 | 24.1 | | | | |
| 11-Jan-05 | 140 | 22.4 | | | | |
| 19-Jan-05 | 143 | 25.6 | | | | |
| 25-Jan-05 | 30 | 23.7 | 80 | 23.9 | 1.40E+12 | 1.76E+13 |
| 5-Apr-05 | 28 | 45.7 | | | | |
| 12-Apr-05 | 100 | 35.8 | | | | |
| 19-Apr-05 | 420 | 28.2 | | | | |
| 28-Apr-05 | 113 | 31.4 | 107 | 35.3 | 2.78E+12 | 2.59E+13 |
| 10-May-05 | 170 | 22.2 | | | | |
| 17-May-05 | 250 | 24.7 | | | | |
| 24-May-05 | 195 | 20.6 | | | | |
| 31-May-05 | 180 | 36.7 | 197 | 26.0 | 3.76E+12 | 3.82E+12 |

**Figure A-11**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02207412 Big Haynes Creek at State Road 20 near Conyers, Georgia**

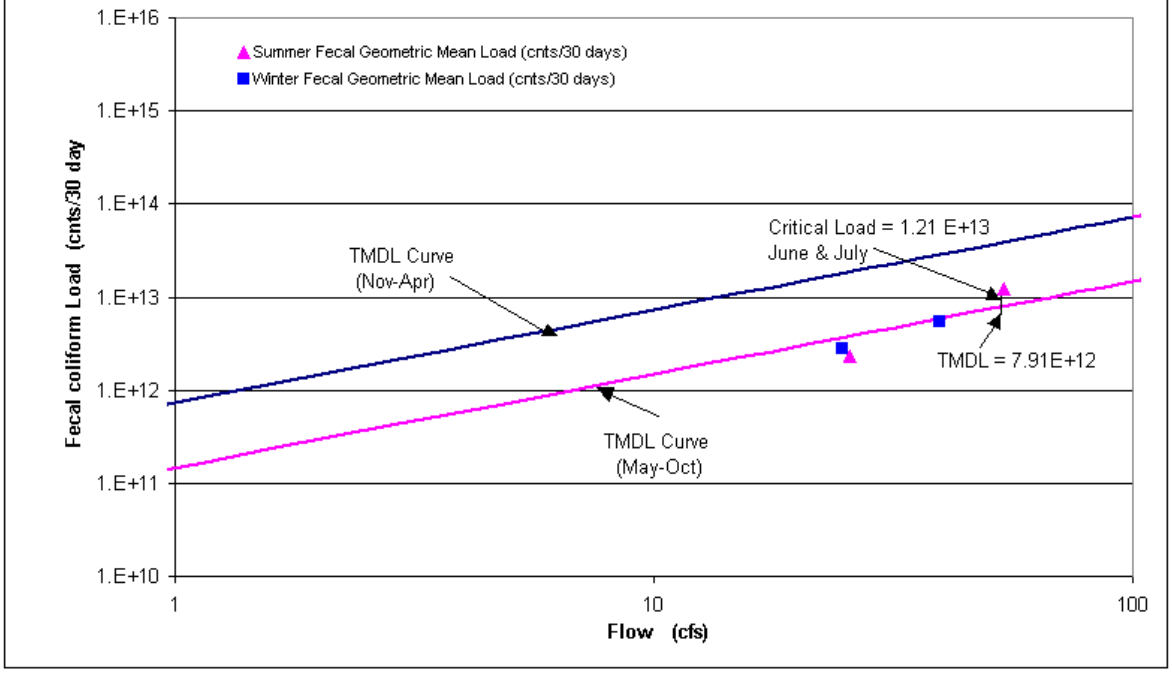



**Table A-11. Data for Figure A-11**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 12-Feb-99 | 230 | 46.3 | | | | |
| 16-Feb-99 | 70 | 36.6 | | | | |
| 22-Feb-99 | 330 | 41.0 | | | | |
| 5-Mar-99 | 220 | 34.3 | 185 | 39.5 | 5.37E+12 | 2.90E+13 |
| 8-Apr-99 | 130 | 27.9 | | | | |
| 13-Apr-99 | 80 | 23.0 | | | | |
| 20-Apr-99 | 330 | 23.3 | 151 | 24.7 | 2.74E+12 | 1.82E+13 |
| 10-Jun-99 | 270 | 14.1 | | | | |
| 17-Jun-99 | 490 | 118.5 | | | | |
| 24-Jun-99 | 60 | 45.6 | | | | |
| 8-Jul-99 | 1100 | 37.4 | 306 | 53.9 | 1.21E+13 | 7.91E+12 |
| 9-Sep-99 | 170 | 24.1 | | | | |
| 30-Sep-99 | 80 | 33.5 | | | | |
| 7-Oct-99 | 130 | 19.5 | 121 | 25.7 | 2.28E+12 | 3.77E+12 |

**Figure A-12**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Big Haynes Creek - Little Haynes Creek to Yellow River**

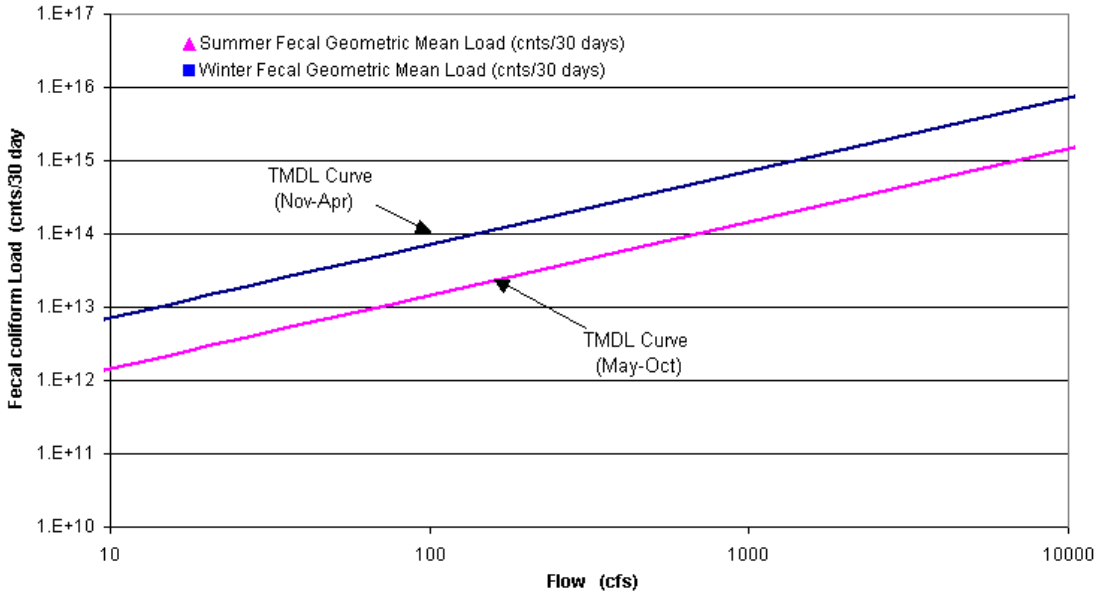



**Table A-12. Data for Figure A-12**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 1-Jan-93 | 100 | 200.8 | | | | |
| 1-Feb-93 | 120 | 144.9 | | | | |
| 1-Mar-93 | 110 | 179.3 | | | | |
| 1-Apr-93 | 160 | 209.4 | | | | |
| 1-May-93 | 200 | 109.3 | | | | |
| 1-Jun-93 | 90 | 267.1 | | | | |
| 1-Jul-93 | 340 | 156.0 | | | | |
| 1-Aug-93 | 380 | 37.5 | | | | |
| 1-Sep-93 | 230 | 39.9 | | | | |
| 1-Oct-93 | 387 | 30.7 | | | | |
| 1-Nov-93 | 120 | 133.2 | | | | |
| 1-Dec-93 | 140 | 90.3 | | | | |
| 13-Jan-94 | 2200 | 264.0 | | | | |
| 17-Mar-94 | 80 | 90.9 | | | | |
| 12-May-94 | 50 | 66.9 | | | | |
| 2-Jun-94 | 60 | 55.3 | | | | |
| 12-Jun-94 | 540 | 122.8 | | | | |
| 6-Jul-94 | 380 | 626.3 | | | | |
| 10-Aug-94 | 120 | 100.1 | | | | |
| 21-Sep-94 | 140 | 124.0 | | | | |
| 13-Oct-94 | 520 | 609.7 | | | | |
| 9-Nov-94 | 70 | 76.8 | | | | |
| 14-Dec-94 | 100 | 114.2 | | | | |
| 19-Jan-95 | 60 | 141.2 | | | | |
| 16-Mar-95 | 80 | 137.5 | | | | |
| 16-May-95 | 190 | 82.9 | | | | |
| 13-Jun-95 | **670** | **238.9** | | | | |
| 13-Jul-95 | 94 | 57.7 | | | | |
| 22-Aug-95 | 407 | 203.9 | | | | |
| 19-Sep-95 | 220 | 87.2 | | | | |
| 31-Oct-95 | 100 | 93.3 | | | | |

**Figure A-13**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02214835 Big Indian Creek at State Road 247 near Kathleen, Georgia**

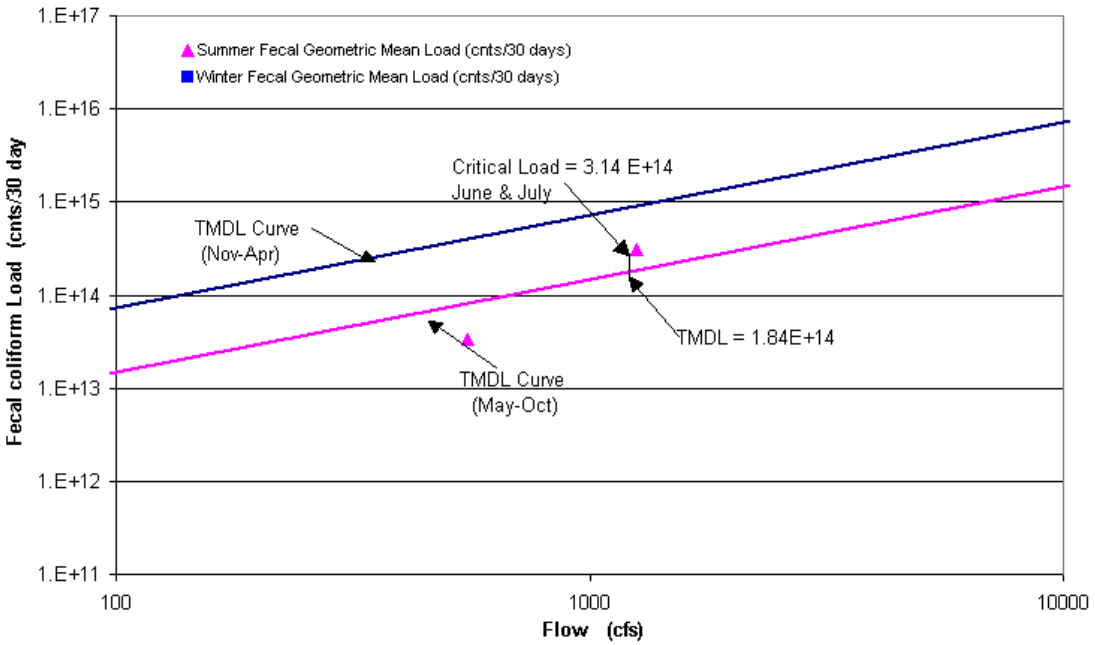



**Table A-13. Data for Figure A-13**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 19-Jan-99 | 20 | 2000.0 | | | | |
| 27-Jan-99 | 230 | 2000.0 | | | | |
| 2-Feb-99 | 1700 | 2000.0 | | | | |
| 18-Feb-99 | 180 | 2000.0 | 194 | 2000.0 | 2.84E+14 | 1.47E+15 |
| 1-Apr-99 | 130 | 1410.0 | | | | |
| 14-Apr-99 | 50 | 453.0 | | | | |
| 21-Apr-99 | 50 | 453.0 | | | | |
| 28-Apr-99 | 40 | 490.0 | 60 | 701.5 | 3.09E+13 | 5.15E+14 |
| 23-Jun-99 | 130 | 131.0 | | | | |
| 30-Jun-99 | 940 | 2000.0 | | | | |
| 14-Jul-99 | 1700 | 2000.0 | | | | |
| 21-Jul-99 | 65 | 883.0 | 341 | 1253.5 | 3.14E+14 | 1.84E+14 |
| 22-Sep-99 | 170 | 987.0 | | | | |
| 29-Sep-99 | 110 | 649.0 | | | | |
| 5-Oct-99 | 50 | 260.0 | | | | |
| 20-Oct-99 | 50 | 307.0 | 83 | 550.8 | 3.34E+13 | 8.09E+13 |

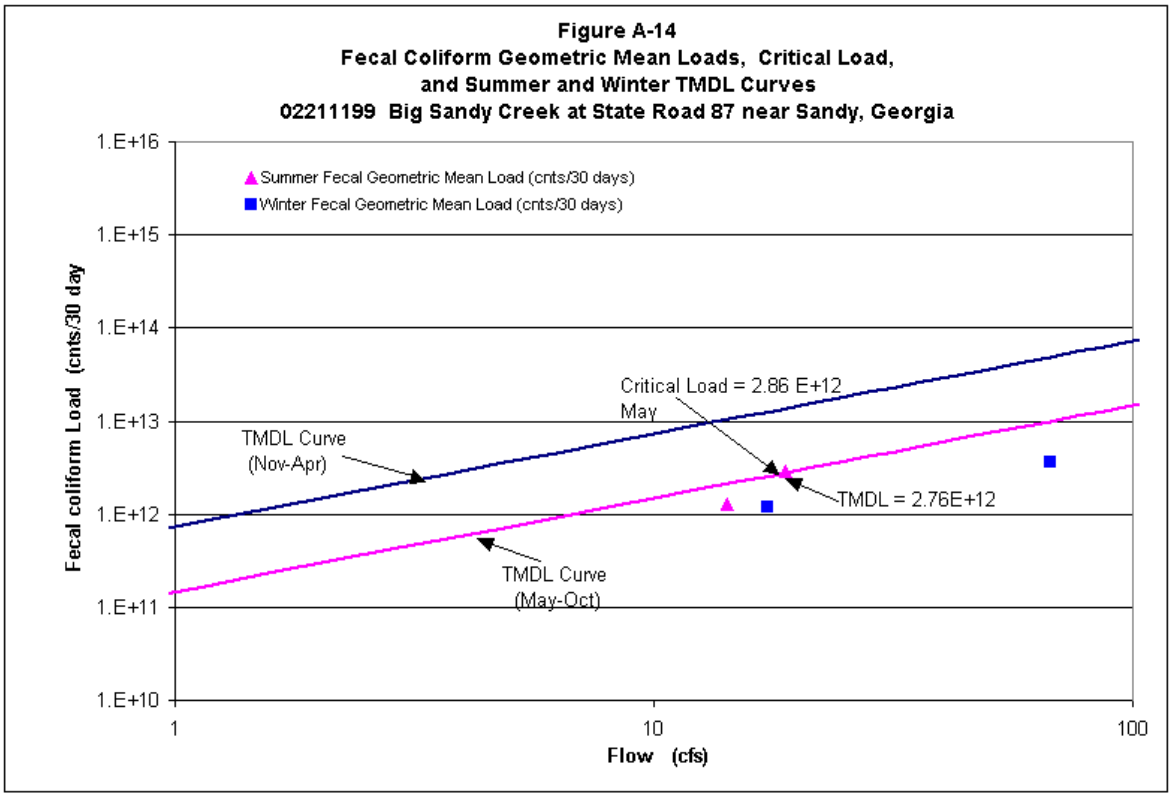



**Table A-14. Data for Figure A-14**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 2-Mar-04 | 110 | 135.5 | | | | |
| 3-Mar-04 | 20 | 32.0 | | | | |
| 18-Mar-04 | 170 | 71.5 | | | | |
| 23-Mar-04 | 80 | 30.8 | 74 | 67.5 | 3.66E+12 | 4.95E+13 |
| 6-May-04 | 110 | 15.5 | | | | |
| 13-May-04 | 300 | 2.5 | | | | |
| 19-May-04 | 70 | 13.1 | | | | |
| 26-May-04 | 800 | 44.0 | 207 | 18.8 | 2.86E+12 | 2.76E+12 |
| 4-Aug-04 | 130 | 31.0 | | | | |
| 12-Aug-04 | 230 | 8.6 | | | | |
| 18-Aug-04 | 80 | 8.6 | | | | |
| 23-Aug-04 | 90 | 8.6 | 121 | 14.2 | 1.26E+12 | 2.08E+12 |
| 18-Nov-04 | 130 | 12.0 | | | | |
| 22-Nov-04 | 110 | 10.0 | | | | |
| 2-Dec-04 | 140 | 31.0 | | | | |
| 8-Dec-04 | 40 | 16.0 | 95 | 17.3 | 1.20E+12 | 1.27E+13 |

**Figure A-15**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Bromolow Creek Headwaters to Beaver Ruin Creek**

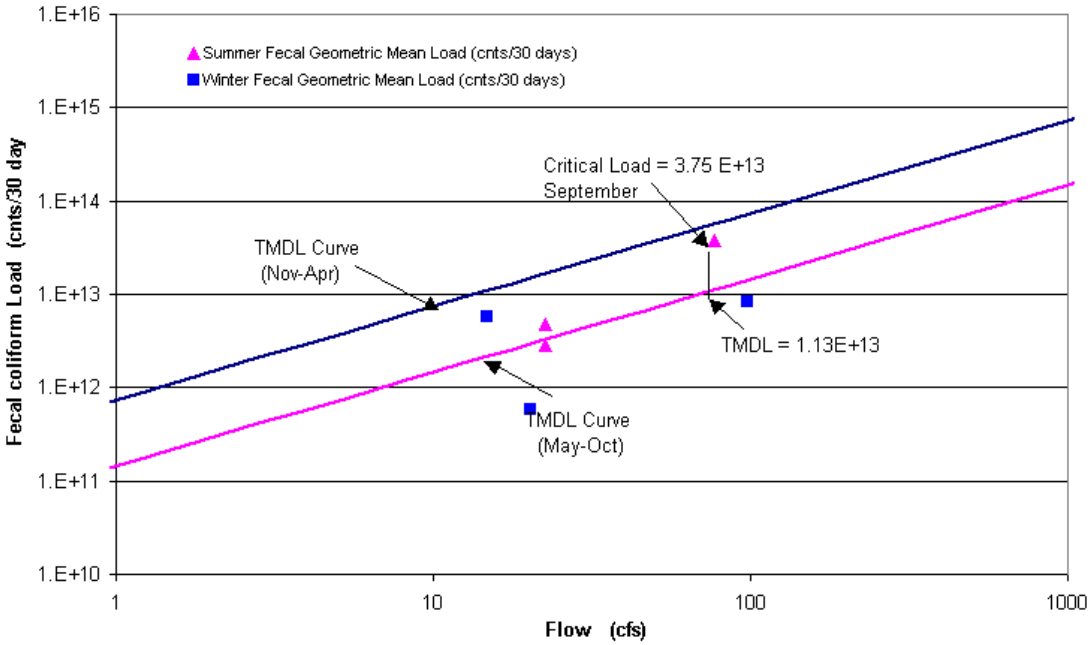



**Table A-15. Data for Figure A-15**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| Mar-04 | 3654 | 15.7 | | | | |
| Mar-04 | 980 | 14.5 | | | | |
| Mar-04 | 260 | 13.1 | | | | |
| Mar-04 | 80 | 15.8 | 522 | 14.8 | 5.66E+12 | 1.08E+13 |
| Jul-04 | 210 | 48.9 | | | | |
| Jul-04 | 800 | 21.0 | | | | |
| Jul-04 | 230 | 9.8 | | | | |
| Jul-04 | 170 | 11.0 | 285 | 22.7 | 4.74E+12 | 3.33E+12 |
| Sep-04 | 500 | 12.1 | | | | |
| Sep-04 | 270 | 257.6 | | | | |
| Sep-04 | 1100 | 9.6 | | | | |
| Sep-04 | 1300 | 29.2 | 663 | 77.1 | 3.75E+13 | 1.13E+13 |
| Jan-05 | 20 | 15.3 | | | | |
| Jan-05 | 20 | 14.8 | | | | |
| Jan-05 | 70 | 26.6 | | | | |
| Jan-05 | 80 | 24.1 | 39 | 20.2 | 5.74E+11 | 1.48E+13 |
| Apr-05 | 140 | 218.2 | | | | |
| Apr-05 | 800 | 68.4 | | | | |
| Apr-05 | 20 | 19.0 | | | | |
| Apr-05 | 80 | 84.6 | 116 | 97.6 | 8.28E+12 | 7.16E+13 |
| Jun-05 | 110 | 45.2 | | | | |
| Jun-05 | 400 | 17.6 | | | | |
| Jun-05 | 40 | 16.3 | | | | |
| Jun-05 | 500 | 11.2 | 172 | 22.6 | 2.85E+12 | 3.31E+12 |

**Figure A-16**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Brushy Fork Creek - Lake Carlton to Big Haynes Creek (Gwinnett County)**

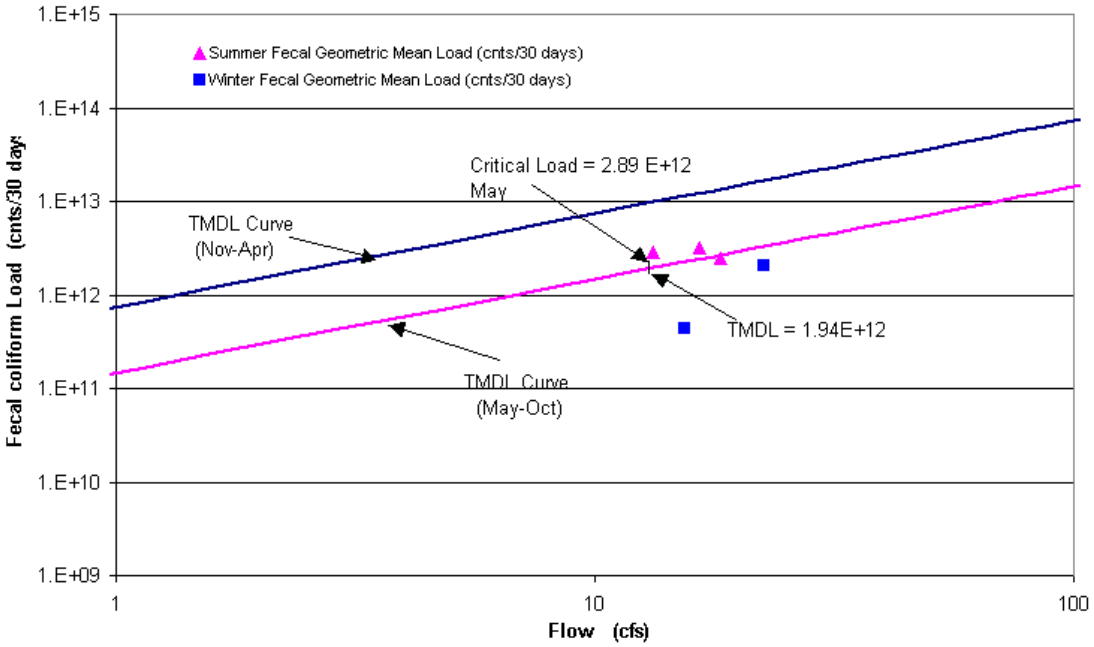



**Table A-16. Data for Figure A-16**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 4-May-04 | 700 | 14 | | | | |
| 11-May-04 | 200 | 12 | | | | |
| 18-May-04 | 207 | 16 | | | | |
| 25-May-04 | 270 | 10 | 297 | 13.2 | 2.89E+12 | 1.94E+12 |
| 5-Oct-04 | 147 | 18 | | | | |
| 12-Oct-04 | 220 | 12 | | | | |
| 19-Oct-04 | 250 | 32 | | | | |
| 26-Oct-04 | 140 | 11 | 183 | 18.4 | 2.47E+12 | 2.69E+12 |
| 4-Jan-05 | 13 | 15 | | | | |
| 11-Jan-05 | 180 | 14 | | | | |
| 18-Jan-05 | 30 | 17 | | | | |
| 25-Jan-05 | 30 | 15 | 38 | 15.4 | 4.31E+11 | 1.13E+13 |
| 5-Apr-05 | 86 | 29 | | | | |
| 12-Apr-05 | 110 | 23 | | | | |
| 19-Apr-05 | 200 | 18 | | | | |
| 28-Apr-05 | 133 | 20 | 126 | 22.5 | 2.08E+12 | 1.65E+13 |
| 10-May-05 | 187 | 14 | | | | |
| 17-May-05 | 210 | 16 | | | | |
| 24-May-05 | 470 | 13 | | | | |
| 31-May-05 | 240 | 23 | 258 | 16.6 | 3.14E+12 | 2.44E+12 |

**Figure A-17**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Cabin Creek Headwaters Griffin to Towaliga River (Spalding Co)**

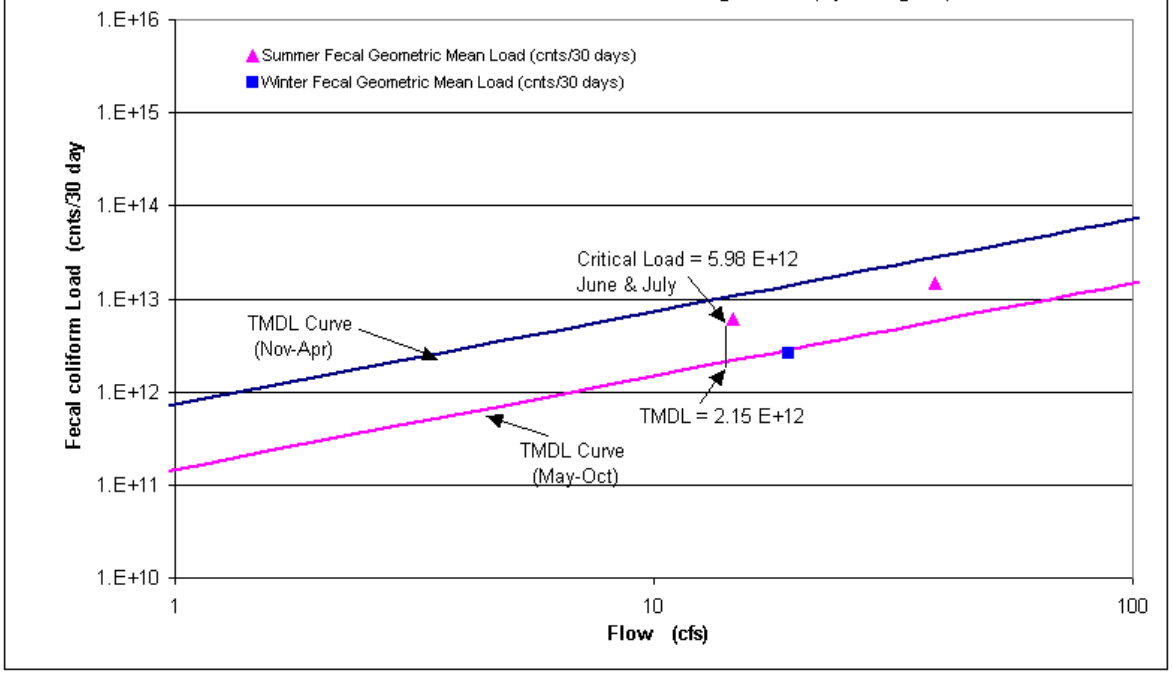



**Table A-17. Data for Figure A-17**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 15-Mar-04 | 170 | 23.2 | | | | |
| 22-Mar-04 | 300 | 18.2 | | | | |
| 29-Mar-04 | 170 | 22.7 | | | | |
| 5-Apr-04 | 130 | 12.3 | 183 | 19.1 | 2.57E+12 | 1.40E+13 |
| 21-Jun-04 | 500 | 4.1 | | | | |
| 28-Jun-04 | 3000 | 40.0 | | | | |
| 6-Jul-04 | 800 | 11.5 | | | | |
| 13-Jul-04 | 80 | 3.0 | 557 | 14.6 | 5.98E+12 | 2.15E+12 |
| 14-Sep-04 | 800 | 102.1 | | | | |
| 22-Sep-04 | 230 | 18.4 | | | | |
| 4-Oct-04 | 500 | 18.6 | | | | |
| 12-Oct-04 | 800 | 15.2 | 521 | 38.6 | 1.48E+13 | 5.66E+12 |

**Figure A-18**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Camp Creek - Headwaters to Jackson Creek**

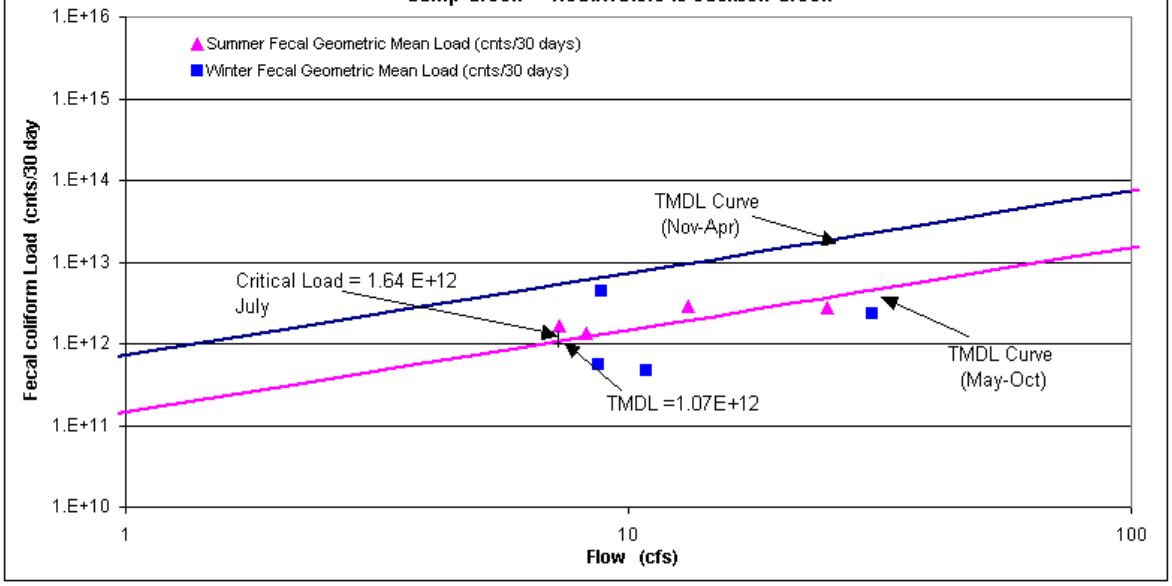



**Table A-18. Data for Figure A-18**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| Jan-04 | 300 | 10.4 | | | | |
| Jan-04 | 20 | 7.6 | | | | |
| Jan-04 | 80 | 7.3 | | | | |
| Jan-04 | 110 | 9.6 | 85 | 8.7 | 5.47E+11 | 6.41E+12 |
| Mar-04 | 5475 | 9.3 | | | | |
| Mar-04 | 548 | 8.3 | | | | |
| Mar-04 | 230 | 7.6 | | | | |
| Mar-04 | 300 | 10.1 | 674 | 8.8 | 4.37E+12 | 6.47E+12 |
| Jul-04 | 20 | 11.1 | | | | |
| Jul-04 | 1100 | 6.0 | | | | |
| Jul-04 | 500 | 5.1 | | | | |
| Jul-04 | 800 | 7.0 | 306 | 7.3 | 1.64E+12 | 1.07E+12 |
| Sep-04 | 170 | 14.9 | | | | |
| Sep-04 | 80 | 54.4 | | | | |
| Sep-04 | 358 | 11.5 | | | | |
| Sep-04 | 110 | 18.6 | 152 | 24.9 | 2.78E+12 | 3.65E+12 |
| Apr-05 | 40 | 21.4 | | | | |
| Apr-05 | 130 | 11.6 | | | | |
| Apr-05 | 80 | 34.9 | | | | |
| Apr-05 | 300 | 54.0 | 106 | 30.5 | 2.36E+12 | 2.24E+13 |
| Jun-05 | 700 | 27.4 | | | | |
| Jun-05 | 300 | 8.9 | | | | |
| Jun-05 | 300 | 9.1 | | | | |
| Jun-05 | 130 | 7.2 | 301 | 13.1 | 2.90E+12 | 1.93E+12 |
| Oct-05 | 800 | 11.7 | | | | |
| Oct-05 | 500 | 7.3 | | | | |
| Oct-05 | 80 | 7.1 | | | | |
| Oct-05 | 80 | 6.8 | 225 | 8.3 | 1.36E+12 | 1.21E+12 |
| Dec-05 | 110 | 10.8 | | | | |
| Dec-05 | 40 | 15.2 | | | | |
| Dec-05 | 140 | 8.8 | | | | |
| Dec-05 | 20 | 8.6 | 59 | 10.8 | 4.71E+11 | 7.96E+12 |

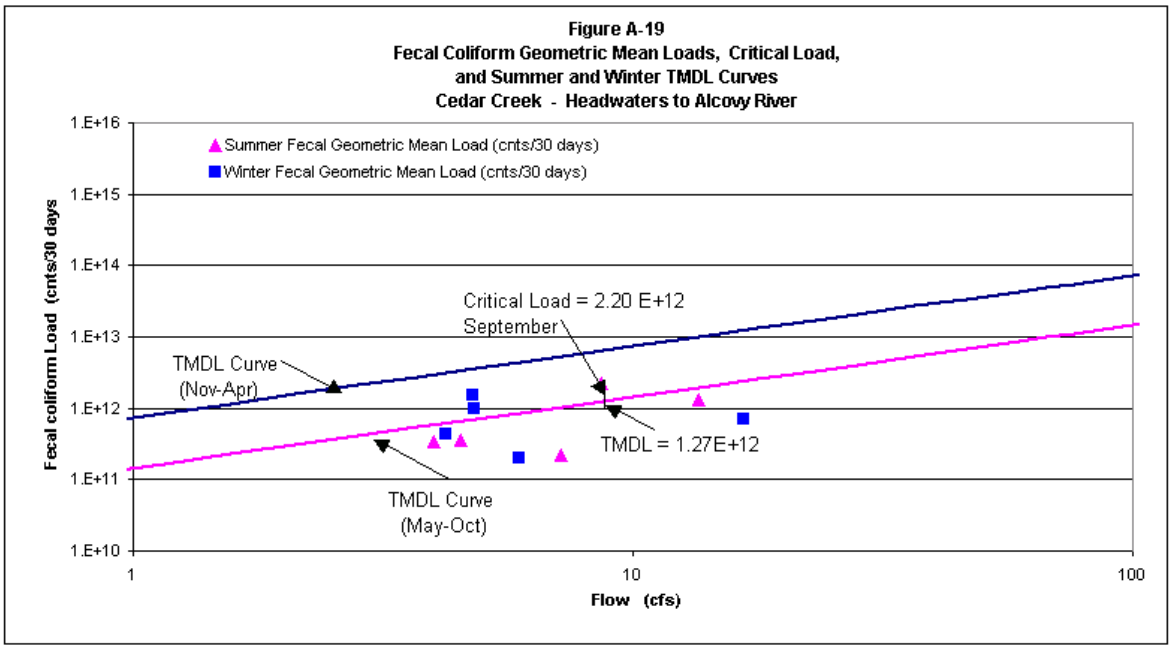



**Table A-19. Data for Figure A-19**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 9-Sep-03 | 1300 | 4.7 | | | | |
| 16-Sep-03 | 500 | 3.6 | | | | |
| 23-Sep-03 | 170 | 23.4 | | | | |
| 30-Sep-03 | 130 | 3.0 | 346 | 8.7 | 2.20E+12 | 1.27E+12 |
| 9-Nov-03 | 220 | 3.9 | | | | |
| 16-Nov-03 | 90 | 3.1 | | | | |
| 23-Nov-03 | 170 | 4.5 | | | | |
| 30-Nov-03 | 110 | 5.4 | 139 | 4.2 | 4.30E+11 | 3.10E+12 |
| 10-Jan-04 | 110 | 5.7 | | | | |
| 17-Jan-04 | 300 | 4.1 | | | | |
| 24-Jan-04 | 900 | 4.0 | | | | |
| 31-Jan-04 | 1100 | 5.3 | 425 | 4.8 | 1.49E+12 | 3.51E+12 |
| 10-Mar-04 | 4352 | 5.1 | | | | |
| 17-Mar-04 | 166 | 4.6 | | | | |
| 24-Mar-04 | 80 | 4.1 | | | | |
| 31-Mar-04 | 110 | 5.5 | 283 | 4.8 | 1.00E+12 | 3.54E+12 |
| 10-Jul-04 | 90 | 6.1 | | | | |
| 17-Jul-04 | 230 | 3.3 | | | | |
| 24-Jul-04 | 220 | 2.8 | | | | |
| 31-Jul-04 | 40 | 3.8 | 116 | 4.0 | 3.40E+11 | 5.86E+11 |
| 9-Sep-04 | 140 | 8.1 | | | | |
| 16-Sep-04 | 40 | 29.7 | | | | |
| 23-Sep-04 | 230 | 6.3 | | | | |
| 30-Sep-04 | 220 | 10.2 | 130 | 13.6 | 1.29E+12 | 1.99E+12 |
| 9-Apr-05 | 40 | 11.7 | | | | |
| 16-Apr-05 | 170 | 6.4 | | | | |
| 23-Apr-05 | 20 | 19.1 | | | | |
| 30-Apr-05 | 80 | 29.5 | 57 | 16.7 | 7.02E+11 | 1.22E+13 |
| 9-Jun-05 | 40 | 15.0 | | | | |
| 16-Jun-05 | 90 | 4.9 | | | | |
| 23-Jun-05 | 40 | 5.0 | | | | |
| 30-Jun-05 | 20 | 3.9 | 41 | 7.2 | 2.17E+11 | 1.05E+12 |
| 10-Oct-05 | 130 | 6.4 | | | | |
| 17-Oct-05 | 80 | 4.0 | | | | |
| 24-Oct-05 | 300 | 3.9 | | | | |
| 31-Oct-05 | 40 | 3.7 | 106 | 4.5 | 3.50E+11 | 6.62E+11 |
| 10-Dec-05 | 20 | 5.9 | | | | |
| 17-Dec-05 | 20 | 8.3 | | | | |
| 24-Dec-05 | 130 | 4.8 | | | | |
| 31-Dec-05 | 80 | 4.7 | 45 | 5.9 | 1.96E+11 | 4.35E+12 |

**Figure A-20**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Cobbs Creek Headwaters to Shoal Creek (DeKalb Co)**

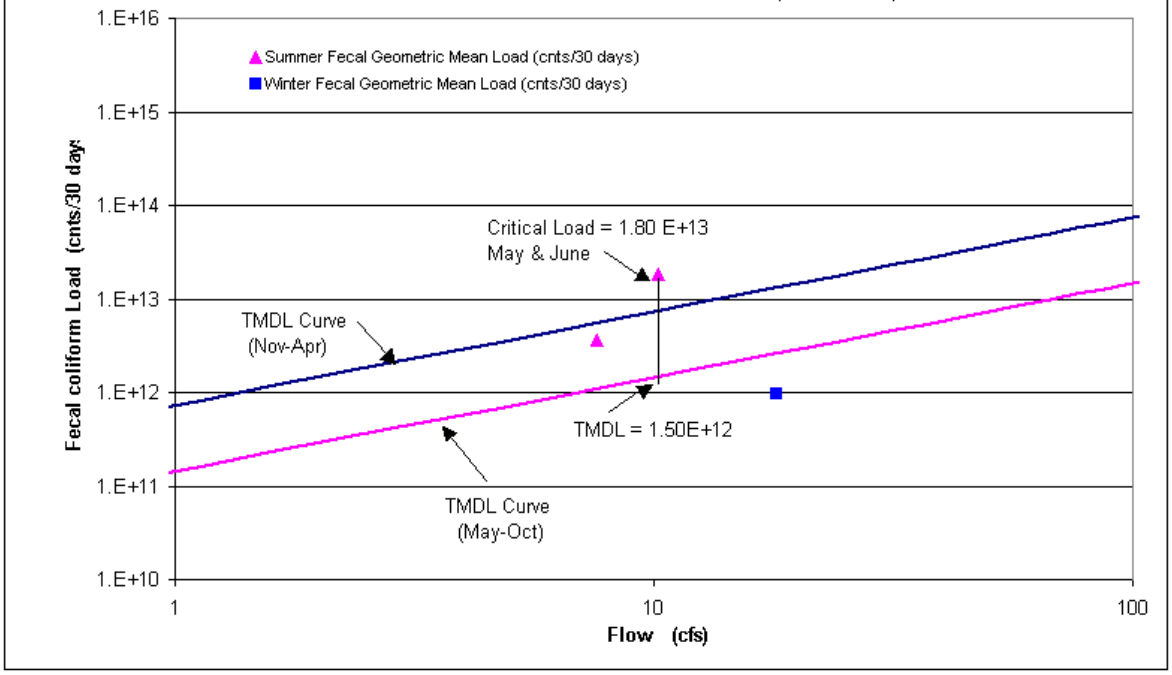



**Table A-20. Data for Figure A-20**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 16-Feb-04 | 40 | 33.3 | | | | |
| 23-Feb-04 | 110 | 13.3 | | | | |
| 1-Mar-04 | 40 | 13.4 | | | | |
| 8-Mar-04 | 170 | 12.3 | 74 | 18.1 | 9.81E+11 | 1.33E+13 |
| 17-May-04 | 2400 | 9.8 | | | | |
| 24-May-04 | 500 | 8.6 | | | | |
| 1-Jun-04 | 4000 | 12.6 | | | | |
| 8-Jun-04 | 7000 | 9.8 | 2408 | 10.2 | 1.80E+13 | 1.50E+12 |
| 23-Aug-04 | 550 | 7.6 | | | | |
| 30-Aug-04 | 500 | 7.0 | | | | |
| 15-Sep-04 | 950 | 8.2 | 639 | 7.6 | 3.57E+12 | 1.12E+12 |

**Figure A-21**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Conley Creek Headwaters to South River (Clayton/DeKalb Co)**

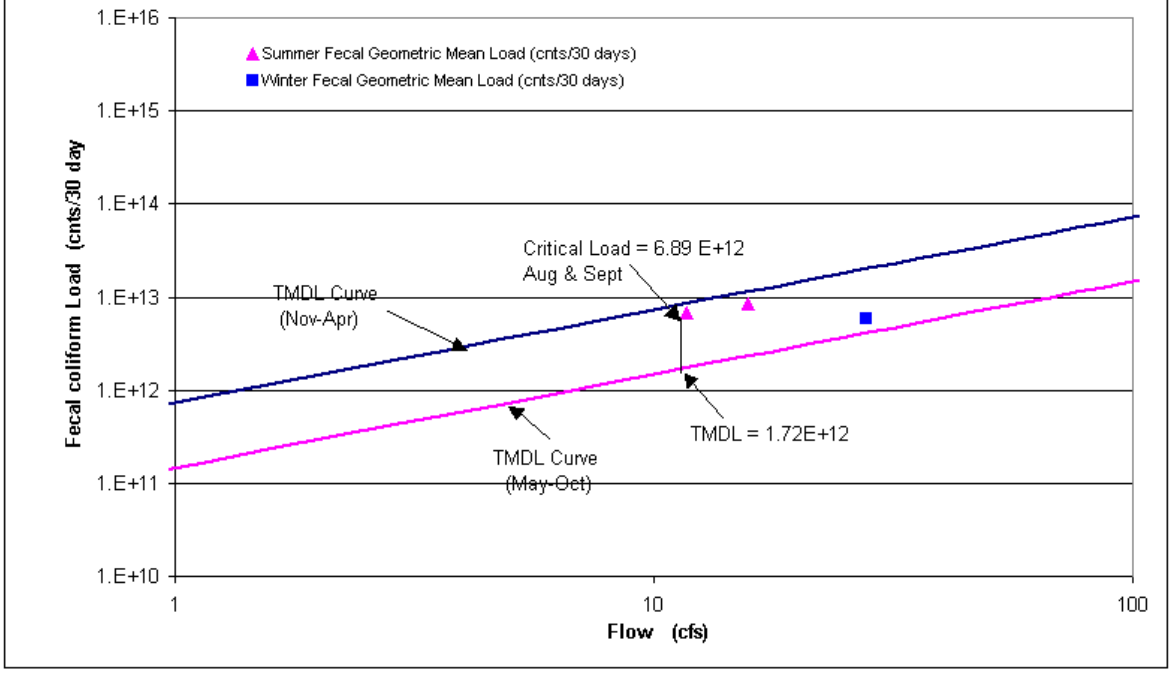



**Table A-21. Data for Figure A-21**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 16-Feb-04 | 3000 | 51.3 | | | | |
| 23-Feb-04 | 130 | 20.5 | | | | |
| 1-Mar-04 | 230 | 20.6 | | | | |
| 8-Mar-04 | 80 | 19.0 | 291 | 27.8 | 5.94E+12 | 2.04E+13 |
| 17-May-04 | 700 | 15.1 | | | | |
| 24-May-04 | 170 | 13.3 | | | | |
| 1-Jun-04 | 5000 | 19.5 | | | | |
| 8-Jun-04 | 500 | 15.1 | 739 | 15.7 | 8.52E+12 | 2.31E+12 |
| 23-Aug-04 | 140 | 11.7 | | | | |
| 30-Aug-04 | 16000 | 10.8 | | | | |
| 15-Sep-04 | 230 | 12.6 | 802 | 11.7 | 6.89E+12 | 1.72E+12 |

**Figure A-22**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Doless Creek Headwaters to Dolittle Creek (DeKalb Co)**

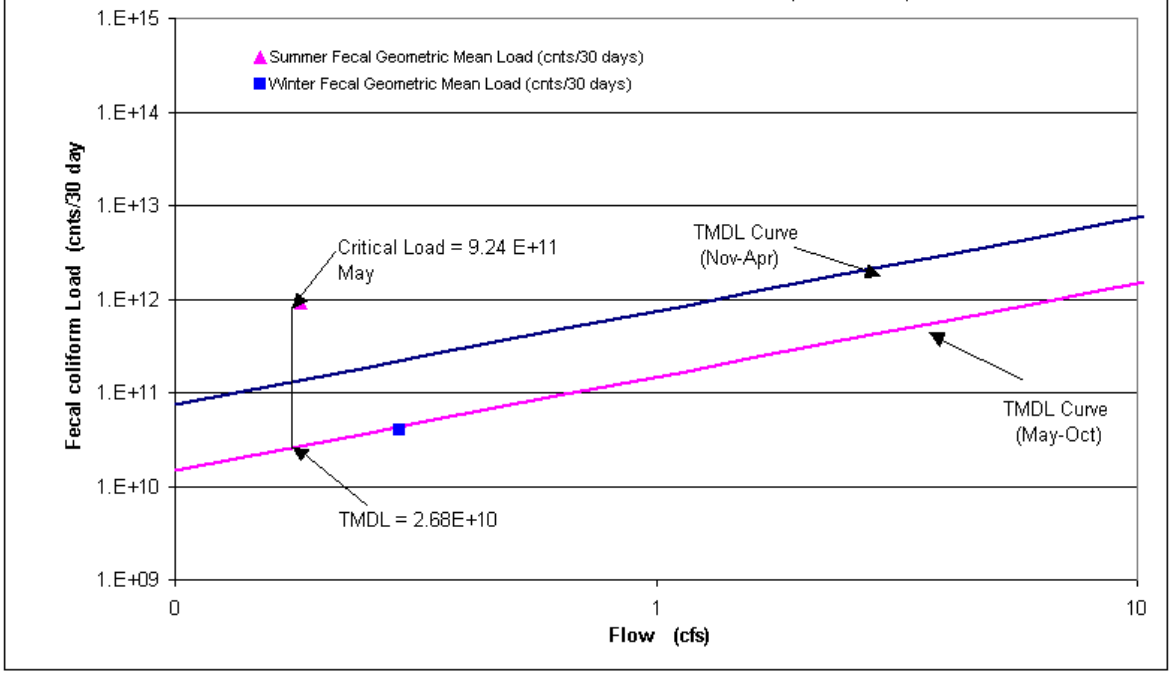



**Table A-22. Data for Figure A-22**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 10-Mar-99 | 20 | 0.3 | | | | |
| 16-Mar-99 | 20 | 0.3 | | | | |
| 22-Mar-99 | 3500 | 0.3 | | | | |
| 25-Mar-99 | 790 | 0.3 | 182 | 0.3 | 3.92E+10 | 2.15E+11 |
| 4-May-99 | 790 | 0.2 | | | | |
| 13-May-99 | 92000 | 0.1 | | | | |
| 17-May-99 | 24000 | 0.1 | | | | |
| 19-May-99 | 1300 | 0.2 | 6901 | 0.2 | 9.24E+11 | 2.68E+10 |

**Figure A-23**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02203831 Doolittle Creek at Flat Shoals Road near Decatur, Georgia**

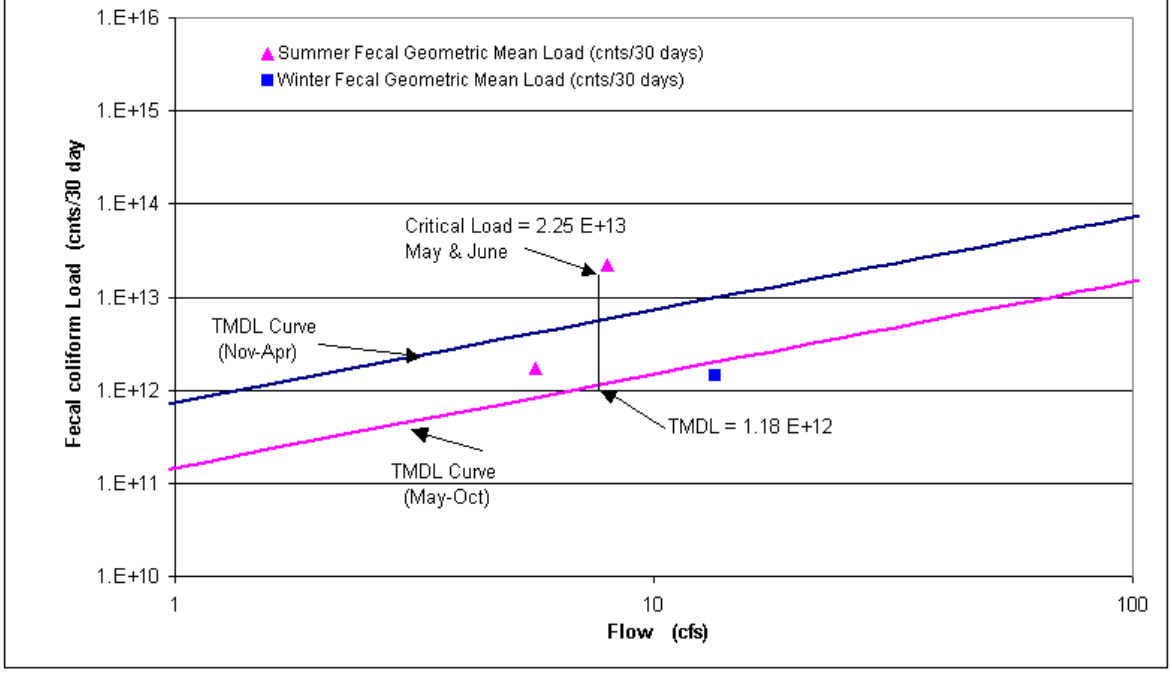



**Table A-23. Data for Figure A-23**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 16-Feb-04 | 170 | 24.8 | | | | |
| 23-Feb-04 | 40 | 9.9 | | | | |
| 1-Mar-04 | 500 | 10.0 | | | | |
| 8-Mar-04 | 130 | 9.2 | 145 | 13.5 | 1.43E+12 | 9.89E+12 |
| 17-May-04 | 700 | 7.3 | | | | |
| 1-Jun-04 | 5000 | 9.4 | | | | |
| 8-Jun-04 | 16000 | 7.3 | 3826 | 8.0 | 2.25E+13 | 1.18E+12 |
| 23-Aug-04 | 800 | 5.7 | | | | |
| 30-Aug-04 | 500 | 5.2 | | | | |
| 15-Sep-04 | 170 | 6.1 | 408 | 5.7 | 1.70E+12 | 8.32E+11 |

**Figure A-24**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02212600 Falling Creek - FAS 1640 Near East Juliet**

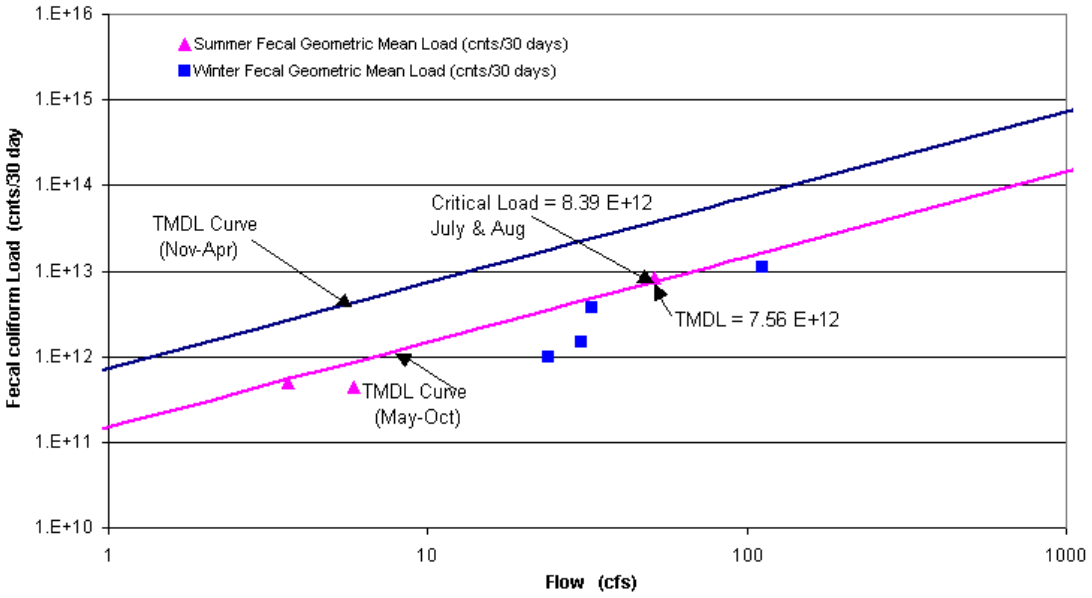



**Table A-24. Data for Figure A-24**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 13-Jan-03 | 330 | 20.9 | | | | |
| 27-Jan-03 | 40 | 19.4 | | | | |
| 3-Feb-03 | 20 | 28.4 | | | | |
| 13-Feb-03 | 80 | 52.2 | 68 | 30.2 | 1.50E+12 | 2.22E+13 |
| 10-Apr-03 | 490 | 303.0 | | | | |
| 16-Apr-03 | 40 | 59.7 | | | | |
| 22-Apr-03 | 130 | 46.3 | | | | |
| 24-Apr-03 | 130 | 38.8 | 135 | 111.9 | 1.11E+13 | 8.22E+13 |
| 14-Jul-03 | 170 | 25.4 | | | | |
| 21-Jul-03 | 300 | 35.8 | | | | |
| 28-Jul-03 | 140 | 37.3 | | | | |
| 4-Aug-03 | 340 | 107.5 | 222 | 51.5 | 8.39E+12 | 7.56E+12 |
| 15-Oct-03 | 500 | 3.1 | | | | |
| 21-Oct-03 | 220 | 3.4 | | | | |
| 27-Oct-03 | 130 | 3.9 | | | | |
| 29-Oct-03 | 80 | 4.2 | 184 | 3.7 | 4.94E+11 | 5.37E+11 |
| 2-Mar-04 | 130 | 52.0 | | | | |
| 3-Mar-04 | 230 | 42.0 | | | | |
| 18-Mar-04 | 230 | 20.0 | | | | |
| 23-Mar-04 | 90 | 17.0 | 158 | 32.8 | 3.79E+12 | 2.40E+13 |
| 6-May-04 | 90 | 9.8 | | | | |
| 13-May-04 | 230 | 6.2 | | | | |
| 20-May-04 | 130 | 4.7 | | | | |
| 26-May-04 | 40 | 2.8 | 102 | 5.9 | 4.39E+11 | 8.62E+11 |
| 4-Aug-04 | 170 | 0.9 | | | | |
| 12-Aug-04 | 500 | 1.2 | | | | |
| 18-Aug-04 | 40 | 1.1 | | | | |
| 23-Aug-04 | 130 | 0.5 | 145 | 0.9 | 9.84E+10 | 1.36E+11 |
| 18-Nov-04 | 80 | 13.0 | | | | |
| 22-Nov-04 | 40 | 12.0 | | | | |
| 2-Dec-04 | 40 | 43.0 | | | | |
| 8-Dec-04 | 80 | 28.0 | 57 | 24.0 | 9.97E+11 | 1.76E+13 |

**Figure A-25**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02216612 Gully Creek at Liberty Church Road (CR244) near Hazlehurst, Georgia**

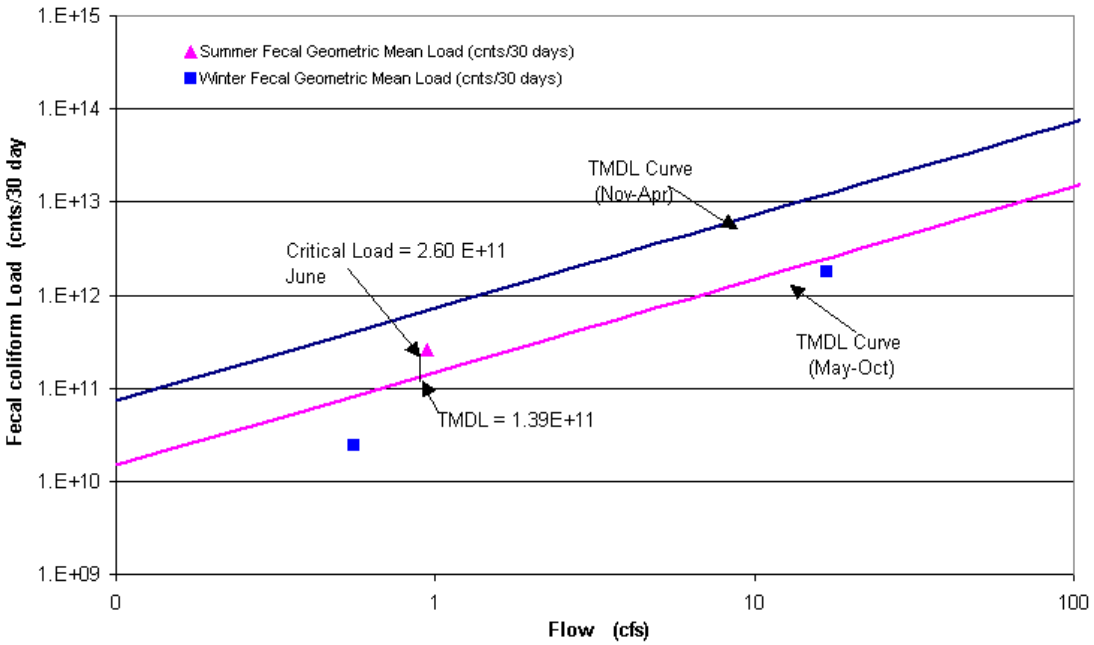



**Table A-25. Data for Figure A-25**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 26-Feb-04 | 2400 | 58.0 | | | | |
| 4-Mar-04 | 40 | 6.6 | | | | |
| 18-Mar-04 | 40 | 1.9 | | | | |
| 23-Mar-04 | 110 | 0.8 | 143 | 16.8 | 1.77E+12 | 1.23E+13 |
| 1-Apr-04 | 40 | 0.6 | | | | |
| 15-Apr-04 | 130 | 0.9 | | | | |
| 8-Apr-04 | 40 | 0.2 | 59 | 0.6 | 2.41E+10 | 4.06E+11 |
| 17-Jun-04 | 790 | 0.1 | | | | |
| 22-Jun-04 | 220 | 0.4 | | | | |
| 24-Jun-04 | 300 | 2.3 | 374 | 0.9 | 2.60E+11 | 1.39E+11 |

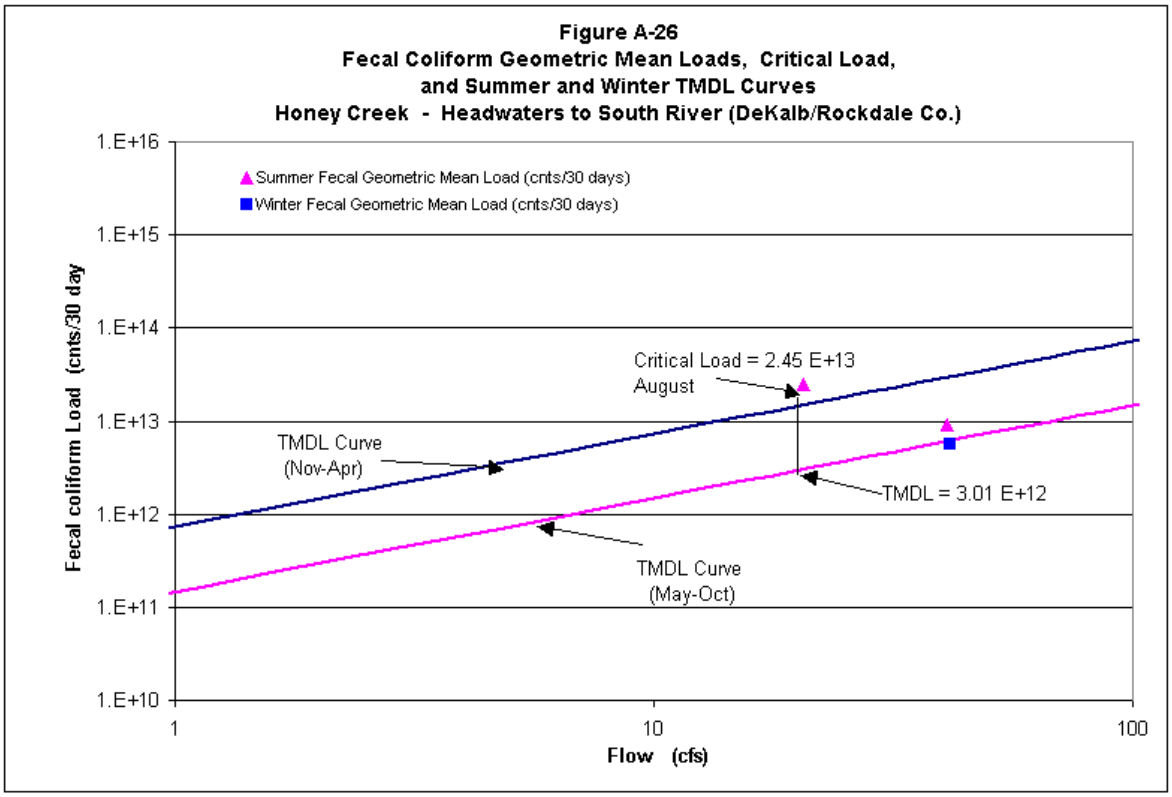



**Table A-26. Data for Figure A-26**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 17-Feb-04 | 195 | 59.2 | | | | |
| 24-Feb-04 | 150 | 37.8 | | | | |
| 2-Mar-04 | 125 | 36.6 | | | | |
| 9-Mar-04 | 315 | 32.8 | 184 | 41.6 | 5.63E+12 | 3.05E+13 |
| 18-May-04 | 900 | 36.4 | | | | |
| 2-Jun-04 | 95 | 24.2 | | | | |
| 9-Jun-04 | 365 | 23.6 | | | | |
| 16-Jun-04 | 270 | 80.0 | 303 | 41.0 | 9.12E+12 | 6.02E+12 |
| 17-Aug-04 | 650 | 22.6 | | | | |
| 24-Aug-04 | 1100 | 19.8 | | | | |
| 31-Aug-04 | 6000 | 19.1 | 1625 | 20.5 | 2.45E+13 | 3.01E+12 |

**Figure A-27**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Hopkins Creek Headwaters to Alcovy River (Gwinnett Co)**

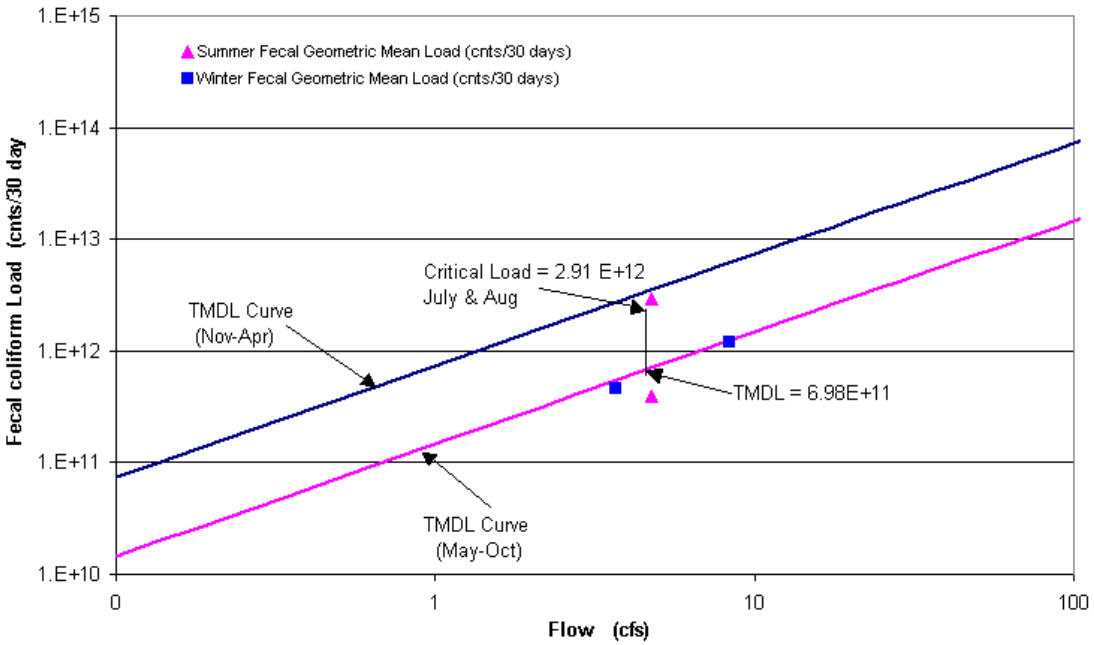



**Table A-27. Data for Figure A-27**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 13-Jan-04 | 40 | 4 | | | | |
| 20-Jan-04 | 110 | 5 | | | | |
| 28-Jan-04 | 700 | 18 | | | | |
| 2-Feb-04 | 500 | 6 | 198 | 8.3 | 1.21E+12 | 6.12E+12 |
| 13-Apr-04 | 2400 | 5 | | | | |
| 19-Apr-04 | 130 | 4 | | | | |
| 21-Apr-04 | 40 | 3 | | | | |
| 28-Apr-04 | 70 | 3 | 172 | 3.7 | 4.64E+11 | 2.70E+12 |
| 20-Jul-04 | 110 | 2 | | | | |
| 26-Jul-04 | 1100 | 9 | | | | |
| 28-Jul-04 | 5000 | 5 | | | | |
| 3-Aug-04 | 800 | 2 | 834 | 4.8 | 2.91E+12 | 6.98E+11 |
| 18-Oct-04 | 20 | 3 | | | | |
| 20-Oct-04 | 1300 | 7 | | | | |
| 25-Oct-04 | 90 | 4 | | | | |
| 27-Oct-04 | 70 | 4 | 113 | 4.7 | 3.94E+11 | 6.96E+11 |

**Figure A-28**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02215276 House Creek at Sea Graves Road near Forest Glen, Georgia**

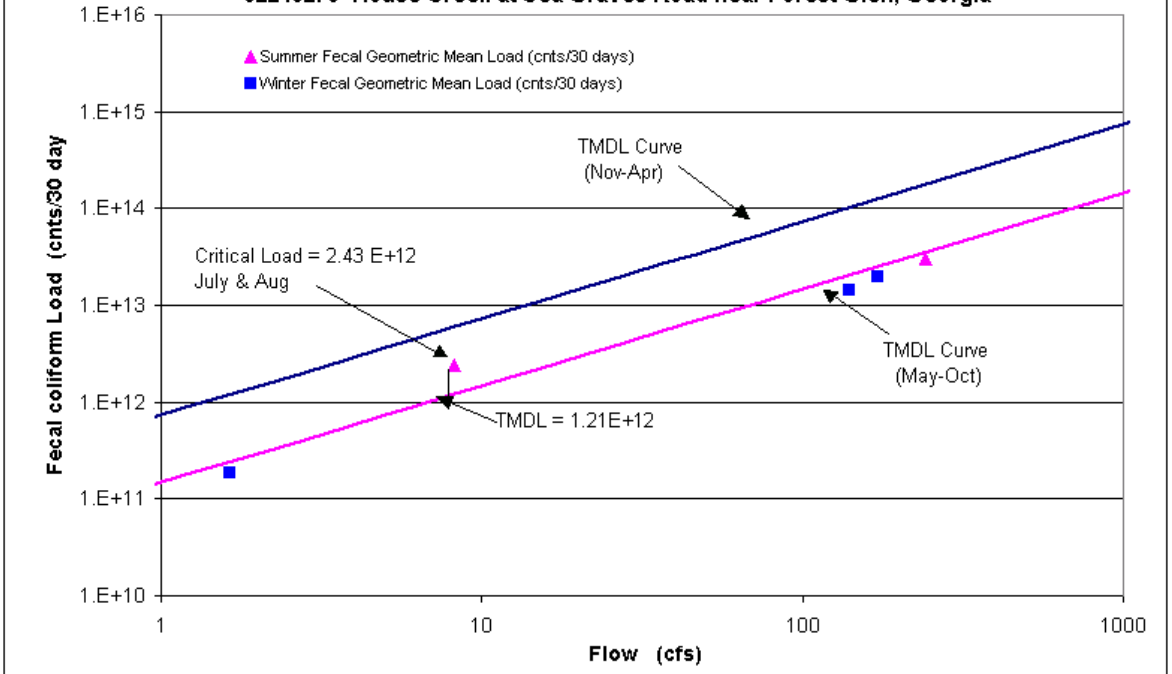



**Table A-28. Data for Figure A-28**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 6-Apr-99 | 460 | 6 | | | | |
| 15-Apr-99 | 231 | 0 | | | | |
| 22-Apr-99 | 20 | 0 | | | | |
| 28-Apr-99 | 270 | 0 | 155 | 1.6 | 1.85E+11 | 1.20E+12 |
| 29-Jul-99 | 130 | 4 | | | | |
| 12-Aug-99 | 1100 | 28 | | | | |
| 19-Aug-99 | 130 | 0 | | | | |
| 26-Aug-99 | 1400 | 1 | 402 | 8.2 | 2.43E+12 | 1.21E+12 |
| 17-Feb-04 | 300 | 241 | | | | |
| 1-Mar-04 | 70 | 174 | | | | |
| 8-Mar-04 | 170 | 85 | | | | |
| 15-Mar-04 | 110 | 62 | 141 | 140.5 | 1.45E+13 | 1.03E+14 |
| 13-Sep-04 | 130 | 130 | | | | |
| 22-Sep-04 | 40 | 40 | | | | |
| 29-Sep-04 | 500 | 500 | | | | |
| 4-Oct-04 | 300 | 300 | 167 | 242.5 | 2.97E+13 | 3.56E+13 |
| 1-Nov-04 | 140 | 140 | | | | |
| 8-Nov-04 | 80 | 80 | | | | |
| 16-Nov-04 | 300 | 300 | | | | |
| 18-Nov-04 | 170 | 170 | 155 | 172.5 | 1.96E+13 | 1.27E+14 |

**Figure A-29**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Intrenchment Creek Headwaters to South River (Fulton/DeKalb Co)**

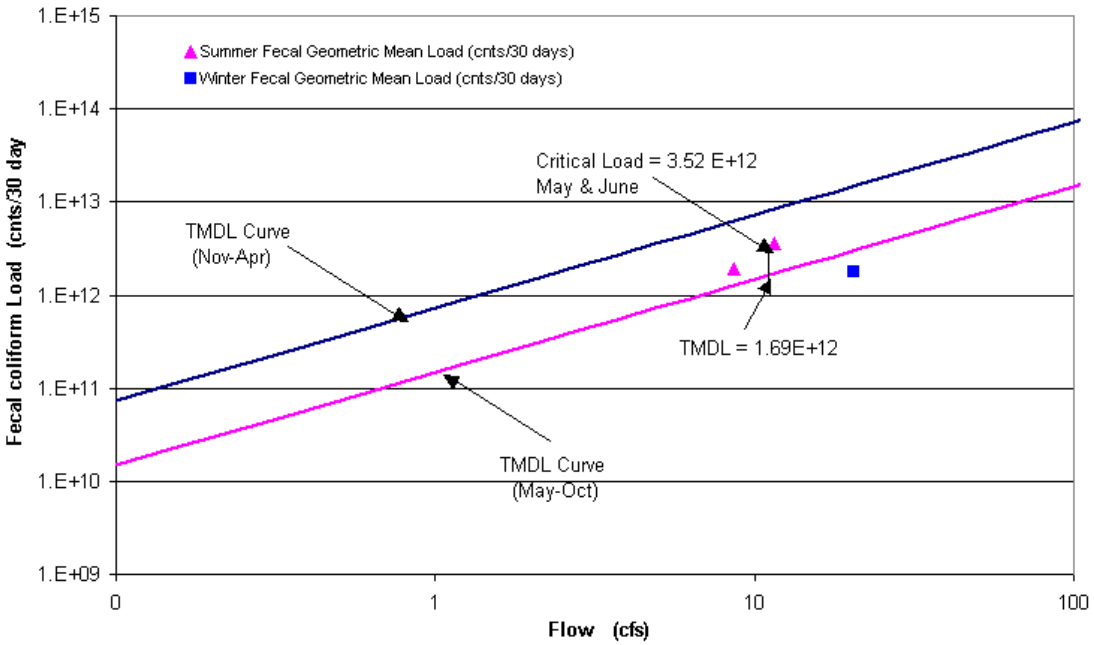



**Table A-29. Data for Figure A-29**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 16-Feb-04 | 20 | 37.7 | | | | |
| 23-Feb-04 | 170 | 15.0 | | | | |
| 1-Mar-04 | 155 | 15.1 | | | | |
| 8-Mar-04 | 360 | 13.9 | 117 | 20.4 | 1.76E+12 | 1.50E+13 |
| 17-May-04 | 20 | 11.1 | | | | |
| 24-May-04 | 1300 | 9.8 | | | | |
| 1-Jun-04 | 230 | 14.3 | | | | |
| 8-Jun-04 | 5000 | 11.1 | 416 | 11.5 | 3.52E+12 | 1.69E+12 |
| 23-Aug-04 | 300 | 8.6 | | | | |
| 30-Aug-04 | 300 | 8.0 | | | | |
| 15-Sep-04 | 300 | 9.3 | 300 | 8.6 | 1.89E+12 | 1.26E+12 |

**Figure A-30**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Jacks Creek - Headwaters to Yellow River (Gwinnett Co)**

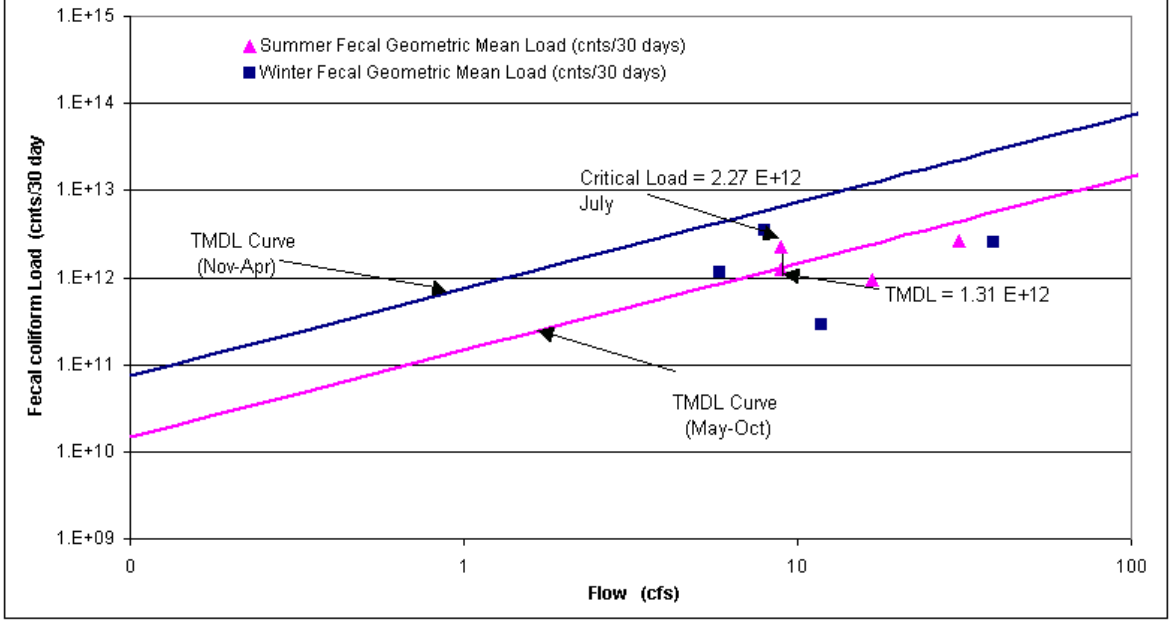



**Table A-30. Data for Figure A-30**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 1-Mar-04 | 2382 | 6.2 | | | | |
| 8-Mar-04 | 461 | 5.7 | | | | |
| 15-Mar-04 | 20 | 5.2 | | | | |
| 31-Mar-04 | 230 | 6.2 | 267 | 5.8 | 1.14E+12 | 4.28E+12 |
| 1-Jul-04 | 110 | 19.3 | | | | |
| 8-Jul-04 | 800 | 8.3 | | | | |
| 15-Jul-04 | 700 | 3.9 | | | | |
| 31-Jul-04 | 230 | 4.3 | 345 | 9.0 | 2.27E+12 | 1.31E+12 |
| 1-Sep-04 | 230 | 4.8 | | | | |
| 8-Sep-04 | 130 | 101.7 | | | | |
| 15-Sep-04 | 80 | 3.8 | | | | |
| 30-Sep-04 | 80 | 11.5 | 118 | 30.5 | 2.63E+12 | 4.47E+12 |
| 1-Jan-05 | 110 | 6.0 | | | | |
| 8-Jan-05 | 5000 | 5.9 | | | | |
| 15-Jan-05 | 800 | 10.5 | | | | |
| 31-Jan-05 | 300 | 9.5 | 603 | 8.0 | 3.53E+12 | 5.86E+12 |
| 1-Apr-05 | 140 | 86.2 | | | | |
| 8-Apr-05 | 40 | 27.0 | | | | |
| 15-Apr-05 | 40 | 7.5 | | | | |
| 30-Apr-05 | 300 | 33.4 | 91 | 38.5 | 2.56E+12 | 2.83E+13 |
| 1-Jun-05 | 130 | 17.8 | | | | |
| 8-Jun-05 | 300 | 6.9 | | | | |
| 15-Jun-05 | 300 | 6.4 | | | | |
| 30-Jun-05 | 110 | 4.4 | 189 | 8.9 | 1.24E+12 | 1.31E+12 |
| 1-Oct-05 | 130 | 3.8 | | | | |
| 8-Oct-05 | 170 | 54.0 | | | | |
| 15-Oct-05 | 80 | 4.8 | | | | |
| 31-Oct-05 | 20 | 4.2 | 77 | 16.7 | 9.46E+11 | 2.45E+12 |
| 1-Dec-05 | 80 | 5.4 | | | | |
| 8-Dec-05 | 20 | 6.6 | | | | |
| 15-Dec-05 | 40 | 29.8 | | | | |
| 31-Dec-05 | 20 | 5.3 | 34 | 11.8 | 2.91E+11 | 8.65E+12 |

**Figure A-31**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Jackson Creek (Gwinnett Co)**

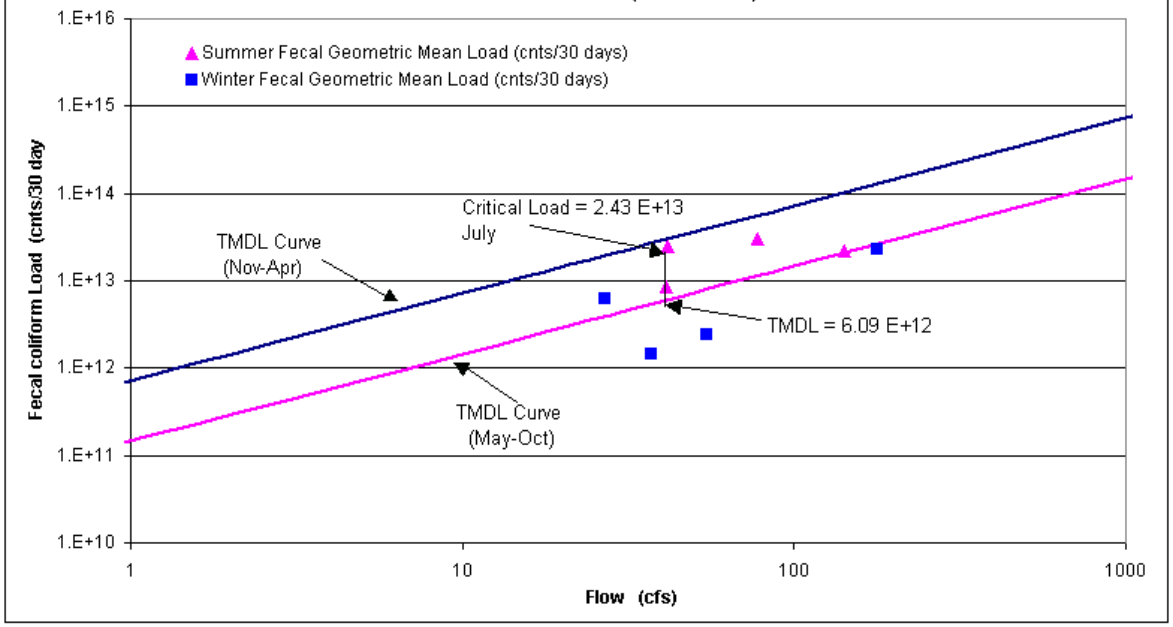



**Table A-31. Data for Figure A-31**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 1-Mar-04 | 2909 | 29 | | | | |
| 8-Mar-04 | 99 | 26 | | | | |
| 15-Mar-04 | 300 | 24 | | | | |
| 31-Mar-04 | 110 | 29 | 312 | 27.0 | 6.19E+12 | 1.98E+13 |
| 1-Jul-04 | 300 | 90 | | | | |
| 8-Jul-04 | 1300 | 38 | | | | |
| 15-Jul-04 | 800 | 18 | | | | |
| 31-Jul-04 | 1300 | 20 | 798 | 41.5 | 2.43E+13 | 6.09E+12 |
| 1-Sep-04 | 300 | 22 | | | | |
| 8-Sep-04 | 230 | 472 | | | | |
| 15-Sep-04 | 130 | 18 | | | | |
| 30-Sep-04 | 230 | 53 | 213 | 141.2 | 2.21E+13 | 2.07E+13 |
| 1-Jan-05 | 70 | 28 | | | | |
| 8-Jan-05 | 70 | 27 | | | | |
| 15-Jan-05 | 80 | 49 | | | | |
| 31-Jan-05 | 20 | 44 | 53 | 37.0 | 1.44E+12 | 2.72E+13 |
| 1-Apr-05 | 300 | 399 | | | | |
| 8-Apr-05 | 140 | 125 | | | | |
| 15-Apr-05 | 130 | 35 | | | | |
| 30-Apr-05 | 170 | 155 | 175 | 178.6 | 2.29E+13 | 1.31E+14 |
| 1-Jun-05 | 1300 | 83 | | | | |
| 8-Jun-05 | 130 | 32 | | | | |
| 15-Jun-05 | 130 | 30 | | | | |
| 30-Jun-05 | 300 | 21 | 285 | 41.3 | 8.64E+12 | 6.06E+12 |
| 1-Oct-05 | 1700 | 18 | | | | |
| 8-Oct-05 | 500 | 251 | | | | |
| 15-Oct-05 | 300 | 22 | | | | |
| 31-Oct-05 | 300 | 20 | 526 | 77.5 | 2.99E+13 | 1.14E+13 |
| 1-Dec-05 | 20 | 25 | | | | |
| 8-Dec-05 | 80 | 30 | | | | |
| 15-Dec-05 | 80 | 138 | | | | |
| 31-Dec-05 | 110 | 25 | 61 | 54.6 | 2.46E+12 | 4.01E+13 |

**Figure A-32**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Little Haynes Creek Hwy 20 to Big Haynes Creek (Walton/Rockdale Co)**

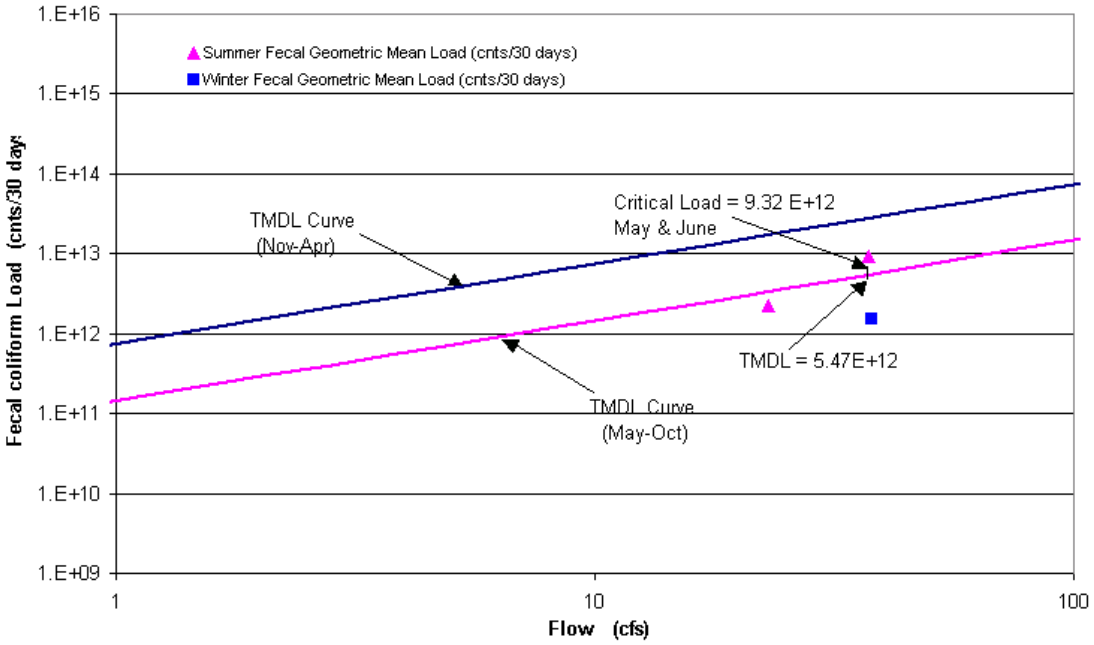



**Table A-32. Data for Figure A-32**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 18-Feb-04 | 40 | 48 | | | | |
| 25-Feb-04 | 20 | 37 | | | | |
| 3-Mar-04 | 80 | 33 | | | | |
| 10-Mar-04 | 130 | 33 | 54 | 37.8 | 1.49E+12 | 2.77E+13 |
| 19-May-04 | 300 | 25 | | | | |
| 26-May-04 | 170 | 20 | | | | |
| 7-Jun-04 | 110 | 19 | | | | |
| 14-Jun-04 | 2400 | 85 | 341 | 37.3 | 9.32E+12 | 5.47E+12 |
| 18-Aug-04 | 300 | 20 | | | | |
| 25-Aug-04 | 110 | 21 | | | | |
| 1-Sep-04 | 110 | 27 | | | | |
| 13-Sep-04 | 80 | 24 | 131 | 23.1 | 2.21E+12 | 3.38E+12 |

**Figure A-33**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Little Stone Mountain Creek Headwaters to Stone Mountain Lake (DeKalb Co)**

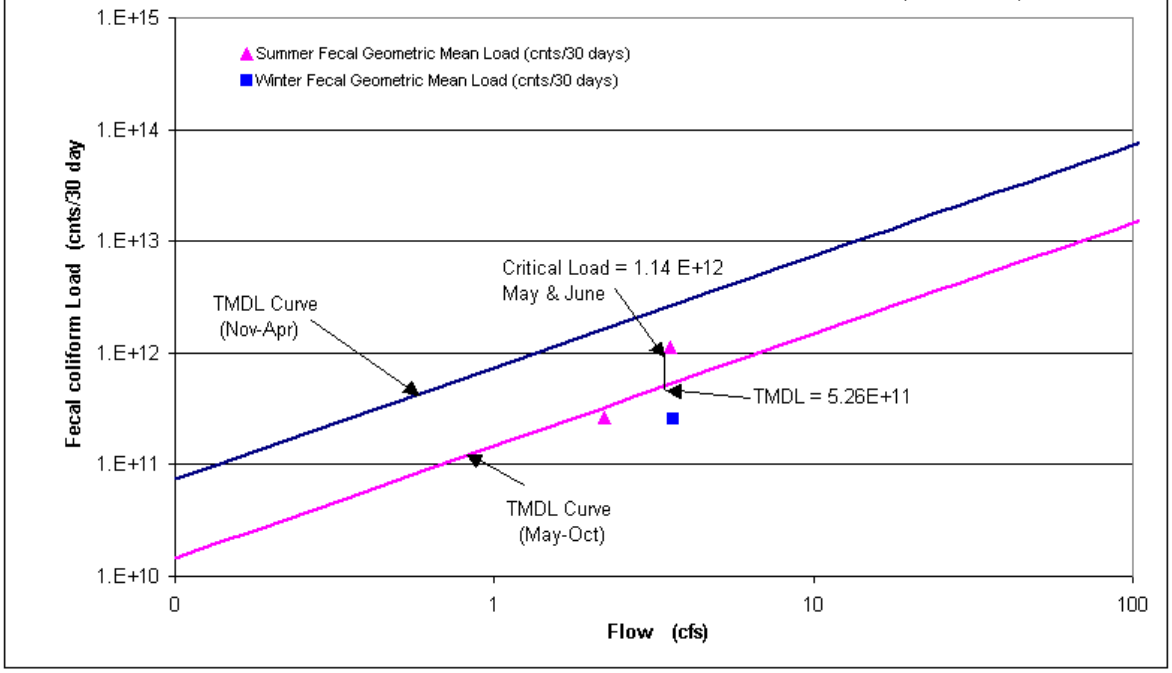



**Table A-33. Data for Figure A-33**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 18-Feb-04 | 140 | 5 | | | | |
| 25-Feb-04 | 20 | 4 | | | | |
| 3-Mar-04 | 800 | 3 | | | | |
| 10-Mar-04 | 40 | 3 | 97 | 3.6 | 2.59E+11 | 2.66E+12 |
| 19-May-04 | 230 | 2 | | | | |
| 26-May-04 | 800 | 2 | | | | |
| 7-Jun-04 | 80 | 2 | | | | |
| 14-Jun-04 | 2400 | 8 | 434 | 3.6 | 1.14E+12 | 5.26E+11 |
| 18-Aug-04 | 300 | 2 | | | | |
| 25-Aug-04 | 80 | 2 | | | | |
| 1-Sep-04 | 130 | 3 | | | | |
| 13-Sep-04 | 230 | 2 | 164 | 2.2 | 2.66E+11 | 3.25E+11 |

**Figure A-34**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Little Suwannee Creek Lake Perin to Yellow River(Gwinnett Co)**

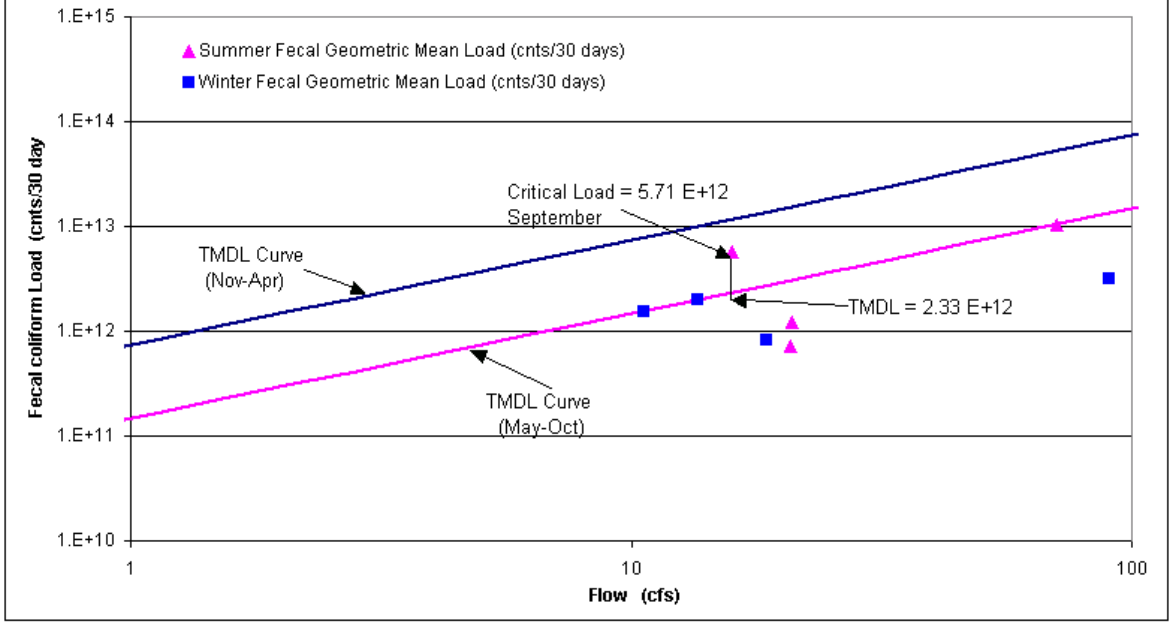



**Table A-34. Data for Figure A-34**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 1-Sep-03 | 800 | 13.5 | | | | |
| 8-Sep-03 | 300 | 12.9 | | | | |
| 15-Sep-03 | 300 | 29.3 | | | | |
| 30-Sep-03 | 800 | 7.8 | 490 | 15.9 | 5.71E+12 | 2.33E+12 |
| 1-Nov-03 | 230 | 8.3 | | | | |
| 8-Nov-03 | 230 | 11.7 | | | | |
| 15-Nov-03 | 130 | 8.2 | | | | |
| 30-Nov-03 | 230 | 14.2 | 199 | 10.6 | 1.55E+12 | 7.77E+12 |
| 1-Mar-04 | 1565 | 14.5 | | | | |
| 8-Mar-04 | 58 | 13.3 | | | | |
| 15-Mar-04 | 80 | 12.1 | | | | |
| 31-Mar-04 | 220 | 14.6 | 200 | 13.6 | 2.00E+12 | 9.99E+12 |
| 1-Jul-04 | 140 | 45.1 | | | | |
| 8-Jul-04 | 80 | 19.3 | | | | |
| 15-Jul-04 | 20 | 9.0 | | | | |
| 31-Jul-04 | 170 | 10.1 | 79 | 20.9 | 1.21E+12 | 3.07E+12 |
| 1-Sep-04 | 110 | 11.2 | | | | |
| 8-Sep-04 | 130 | 237.4 | | | | |
| 15-Sep-04 | 80 | 8.9 | | | | |
| 30-Sep-04 | 1300 | 26.9 | 196 | 71.1 | 1.02E+13 | 1.04E+13 |
| 1-Jan-05 | 40 | 14.1 | | | | |
| 8-Jan-05 | 20 | 13.7 | | | | |
| 15-Jan-05 | 20 | 24.5 | | | | |
| 31-Jan-05 | 800 | 22.2 | 60 | 18.6 | 8.18E+11 | 1.37E+13 |
| 1-Apr-05 | 20 | 201.1 | | | | |
| 8-Apr-05 | 100 | 63.1 | | | | |
| 15-Apr-05 | 70 | 17.5 | | | | |
| 30-Apr-05 | 40 | 78.0 | 49 | 89.9 | 3.21E+12 | 6.60E+13 |
| 1-Jun-05 | 300 | 41.7 | | | | |
| 8-Jun-05 | 20 | 16.2 | | | | |
| 15-Jun-05 | 40 | 15.0 | | | | |
| 30-Jun-05 | 20 | 10.4 | 47 | 20.8 | 7.15E+11 | 3.05E+12 |

**Figure A-35**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**McClain Branch Headwaters to Honey Creek (Rockdale Co)**

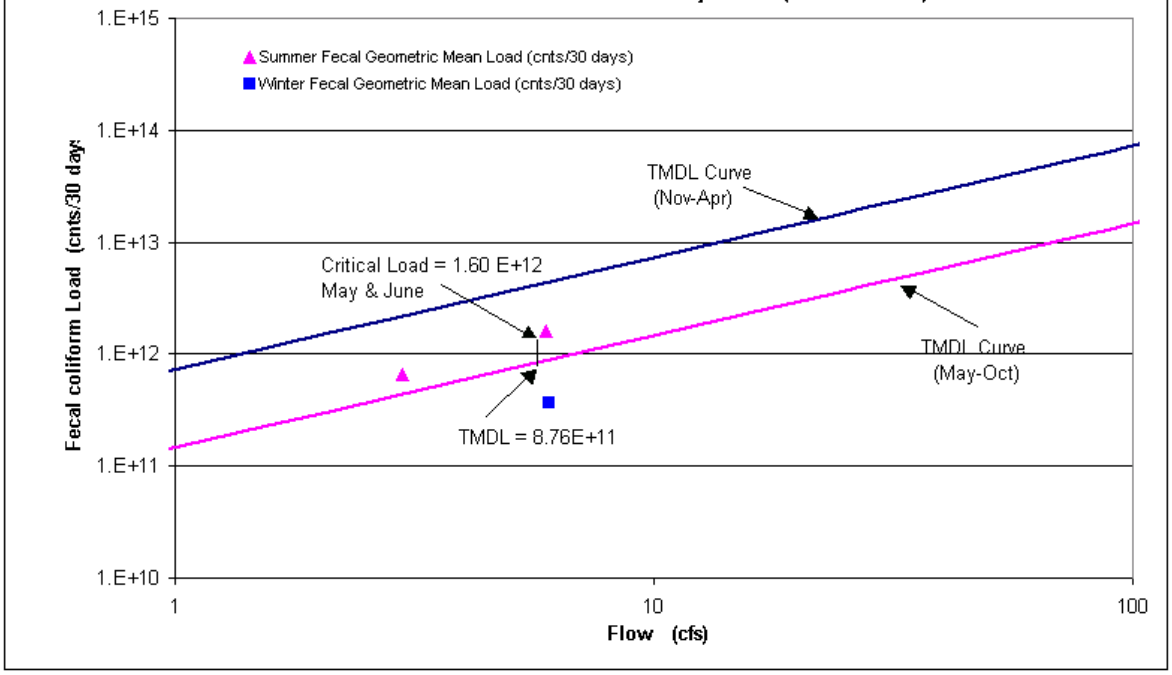



**Table A-35. Data for Figure A-35**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 17-Feb-04 | 20 | 8.6 | | | | |
| 24-Feb-04 | 130 | 5.5 | | | | |
| 2-Mar-04 | 230 | 5.3 | | | | |
| 9-Mar-04 | 80 | 4.8 | 83 | 6.0 | 3.69E+11 | 4.44E+12 |
| 18-May-04 | 170 | 5.3 | | | | |
| 2-Jun-04 | 300 | 3.5 | | | | |
| 9-Jun-04 | 500 | 3.4 | | | | |
| 16-Jun-04 | 700 | 11.6 | 366 | 6.0 | 1.60E+12 | 8.76E+11 |
| 17-Aug-04 | 230 | 3.3 | | | | |
| 24-Aug-04 | 230 | 2.9 | | | | |
| 31-Aug-04 | 500 | 2.8 | 298 | 3.0 | 6.52E+11 | 4.38E+11 |

**Figure A-36**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02215210 Mosquito Creek at Ga. Hwy. 230 near Hawkinsville, Georgia**

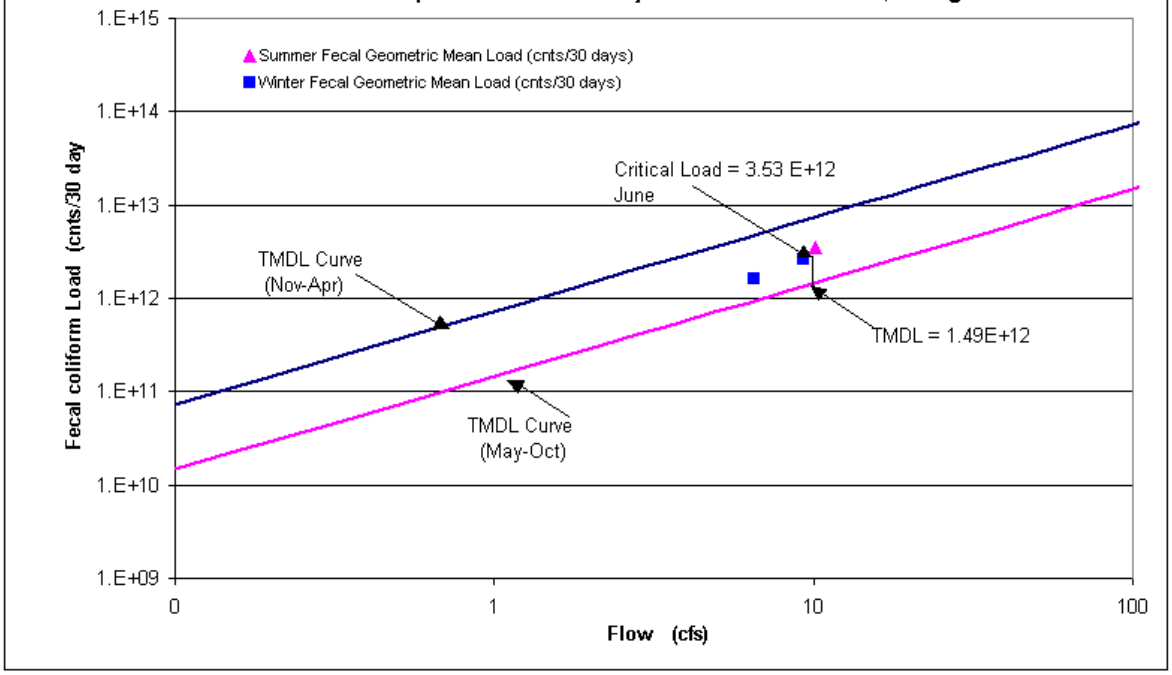



**Table A-36. Data for Figure A-36**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 26-Feb-04 | 16000 | 12.0 | | | | |
| 3-Mar-04 | 20 | 12.0 | | | | |
| 17-Mar-04 | 130 | 7.7 | | | | |
| 23-Mar-04 | 490 | 5.7 | 378 | 9.4 | 2.59E+12 | 6.86E+12 |
| 31-Mar-04 | 110 | 7.0 | | | | |
| 7-Apr-04 | 270 | 7.2 | | | | |
| 15-Apr-04 | 1300 | 5.3 | 338 | 6.5 | 1.61E+12 | 4.77E+12 |
| 16-Jun-04 | 630 | 12.0 | | | | |
| 22-Jun-04 | 1300 | 9.0 | | | | |
| 24-Jun-04 | 130 | 9.4 | 474 | 10.1 | 3.53E+12 | 1.49E+12 |

**Figure A-37**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**No Business Creek Headwaters to Norris Lake (Gwinnett Co.)**

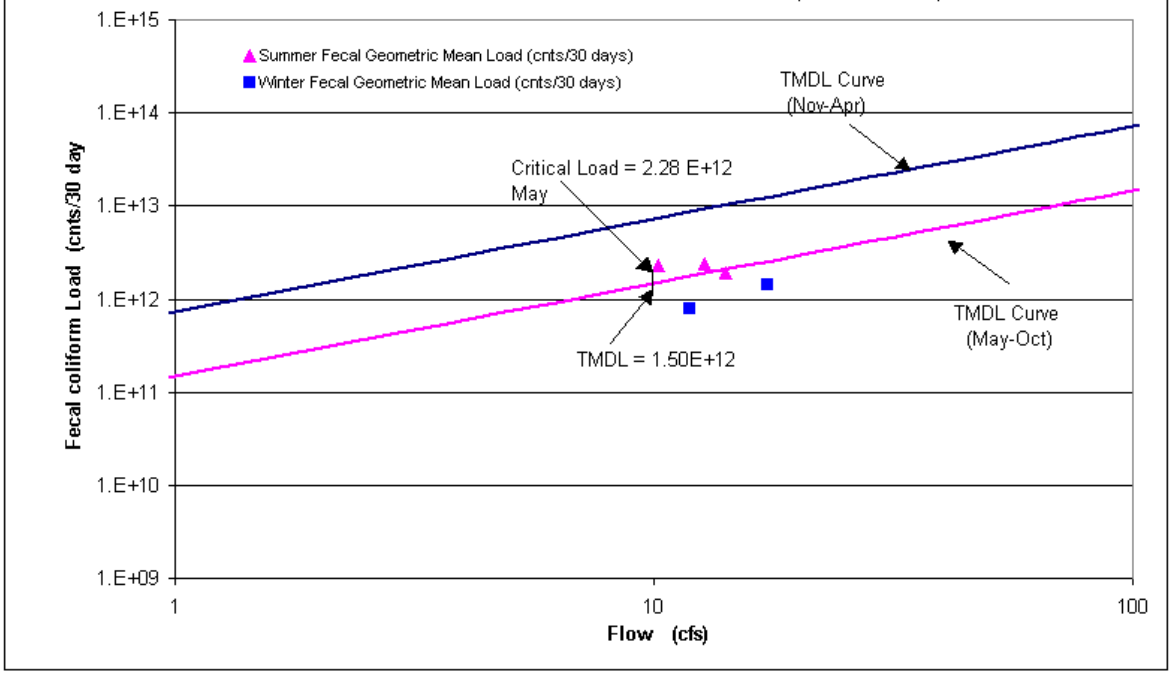



**Table A-37. Data for Figure A-37**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 4-May-04 | 340 | 11.0 | | | | |
| 11-May-04 | 600 | 9.6 | | | | |
| 18-May-04 | 210 | 12.5 | | | | |
| 25-May-04 | 200 | 7.7 | 304 | 10.2 | 2.28E+12 | 1.50E+12 |
| 5-Oct-04 | 120 | 14.3 | | | | |
| 12-Oct-04 | 447 | 9.3 | | | | |
| 19-Oct-04 | 167 | 24.4 | | | | |
| 26-Oct-04 | 133 | 8.6 | 186 | 14.2 | 1.93E+12 | 2.08E+12 |
| 4-Jan-05 | 153 | 11.8 | | | | |
| 11-Jan-05 | 93 | 11.0 | | | | |
| 18-Jan-05 | 50 | 13.0 | | | | |
| 25-Jan-05 | 100 | 11.7 | 92 | 11.9 | 8.01E+11 | 8.72E+12 |
| 5-Apr-05 | 100 | 22.5 | | | | |
| 12-Apr-05 | 83 | 17.6 | | | | |
| 19-Apr-05 | 100 | 13.8 | | | | |
| 28-Apr-05 | 200 | 15.4 | 114 | 17.3 | 1.44E+12 | 1.27E+13 |
| 10-May-05 | 187 | 10.9 | | | | |
| 17-May-05 | 210 | 12.1 | | | | |
| 24-May-05 | 470 | 10.1 | | | | |
| 31-May-05 | 240 | 18.0 | 258 | 12.8 | 2.42E+12 | 1.88E+12 |

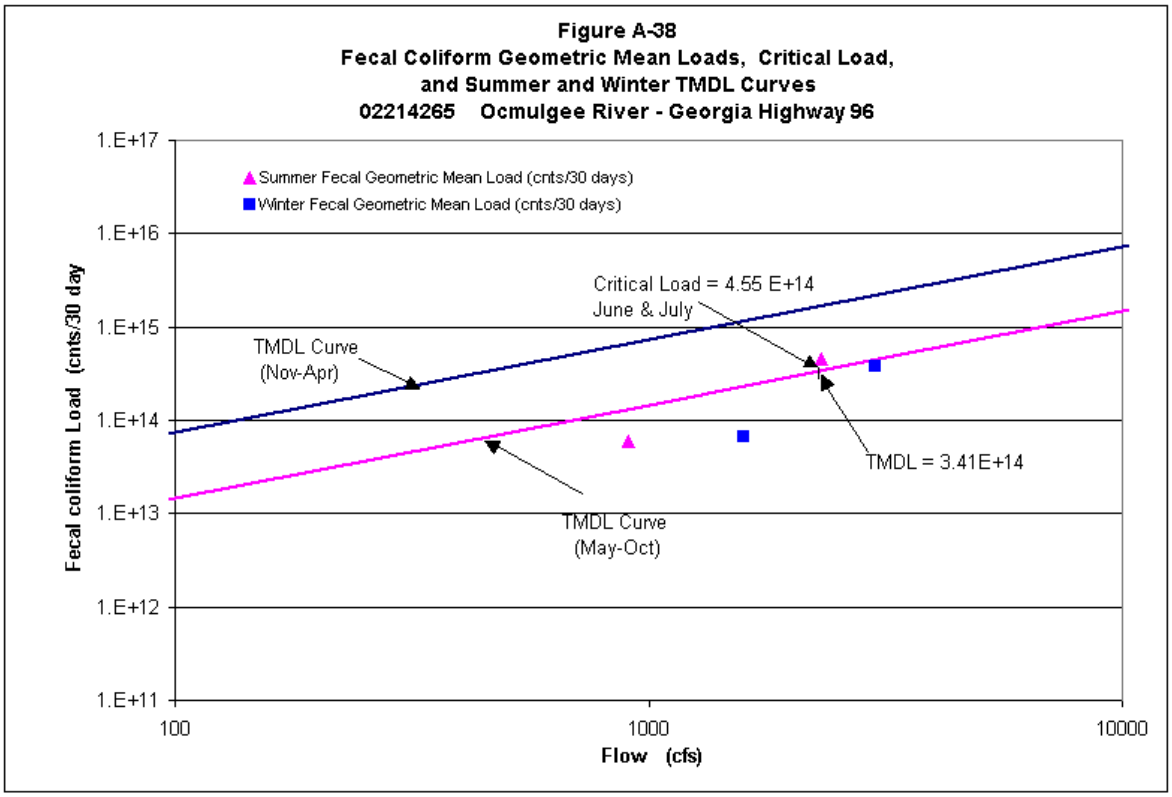



**Table A-38. Data for Figure A-38**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 19-Jan-99 | 20 | 1880.0 | | | | |
| 27-Jan-99 | 490 | 3660.0 | | | | |
| 2-Feb-99 | 490 | 3660.0 | | | | |
| 18-Feb-99 | 170 | 2830.0 | 169 | 3007.5 | 3.73E+14 | 2.21E+15 |
| 1-Apr-99 | 130 | 1960.0 | | | | |
| 14-Apr-99 | 50 | 1510.0 | | | | |
| 21-Apr-99 | 20 | 1550.0 | | | | |
| 28-Apr-99 | 80 | 1350.0 | 57 | 1592.5 | 6.64E+13 | 1.17E+15 |
| 23-Jun-99 | 40 | 1030.0 | | | | |
| 30-Jun-99 | 330 | 3030.0 | | | | |
| 14-Jul-99 | 790 | 3560.0 | | | | |
| 21-Jul-99 | 490 | 1660.0 | 267 | 2320.0 | 4.55E+14 | 3.41E+14 |
| 22-Sep-99 | 80 | 616.0 | | | | |
| 29-Sep-99 | 80 | 776.0 | | | | |
| 5-Oct-99 | 490 | 981.0 | | | | |
| 20-Oct-99 | 20 | 1240.0 | 89 | 903.3 | 5.90E+13 | 1.33E+14 |
| | | | | | | |

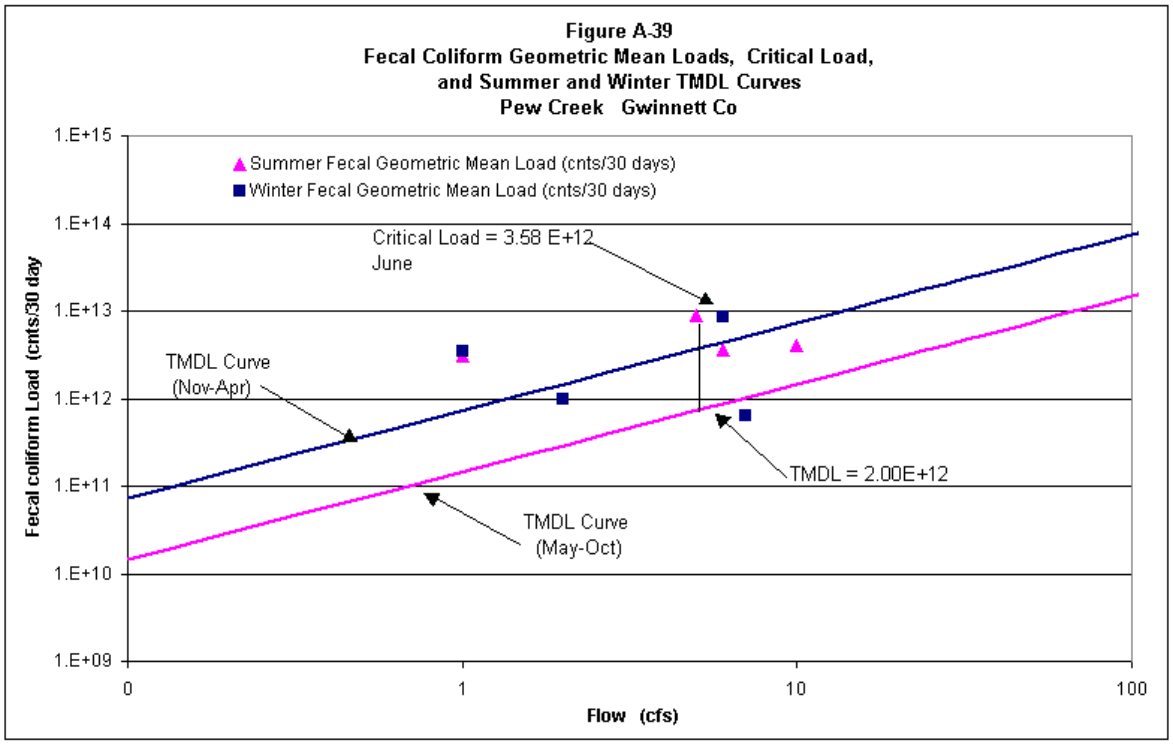



**Table A-39. Data for Figure A-39**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 1-Mar-04 | 4106 | 9.5 | | | | |
| 8-Mar-04 | 144 | 8.7 | | | | |
| 15-Mar-04 | 170 | 7.9 | | | | |
| 31-Mar-04 | 800 | 9.6 | 532 | 9 | 3.49E+12 | 6.55E+12 |
| 1-Jul-04 | 800 | 29.6 | | | | |
| 8-Jul-04 | 300 | 12.7 | | | | |
| 15-Jul-04 | 300 | 5.9 | | | | |
| 31-Jul-04 | 130 | 6.6 | 311 | 14 | 3.13E+12 | 2.01E+12 |
| 1-Sep-04 | 230 | 7.3 | | | | |
| 8-Sep-04 | 110 | 155.7 | | | | |
| 15-Sep-04 | 800 | 5.8 | | | | |
| 30-Sep-04 | 230 | 17.6 | 261 | 47 | 8.94E+12 | 6.84E+12 |
| 1-Jan-05 | 170 | 9.2 | | | | |
| 8-Jan-05 | 230 | 9.0 | | | | |
| 15-Jan-05 | 20 | 16.1 | | | | |
| 31-Jan-05 | 170 | 14.6 | 107 | 12 | 9.62E+11 | 8.96E+12 |
| 1-Apr-05 | 110 | 131.9 | | | | |
| 8-Apr-05 | 500 | 41.4 | | | | |
| 15-Apr-05 | 80 | 11.5 | | | | |
| 30-Apr-05 | 340 | 51.1 | 197 | 59 | 8.51E+12 | 4.33E+13 |
| 1-Jun-05 | 110 | 27.3 | | | | |
| 8-Jun-05 | 230 | 10.6 | | | | |
| 15-Jun-05 | 500 | 9.8 | | | | |
| 30-Jun-05 | 1300 | 6.8 | 358 | 14 | 3.58E+12 | 2.00E+12 |
| 1-Oct-05 | 170 | 5.8 | | | | |
| 8-Oct-05 | 300 | 82.7 | | | | |
| 15-Oct-05 | 230 | 7.4 | | | | |
| 31-Oct-05 | 170 | 6.4 | 211 | 26 | 3.97E+12 | 3.76E+12 |
| 1-Dec-05 | 80 | 8.3 | | | | |
| 8-Dec-05 | 40 | 10.0 | | | | |
| 15-Dec-05 | 20 | 45.6 | | | | |
| 31-Dec-05 | 80 | 8.2 | 48 | 18 | 6.29E+11 | 1.32E+13 |

**Figure A-40**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02213675 Rocky Creek at Rocky Creek Road near Macon, Georgia**

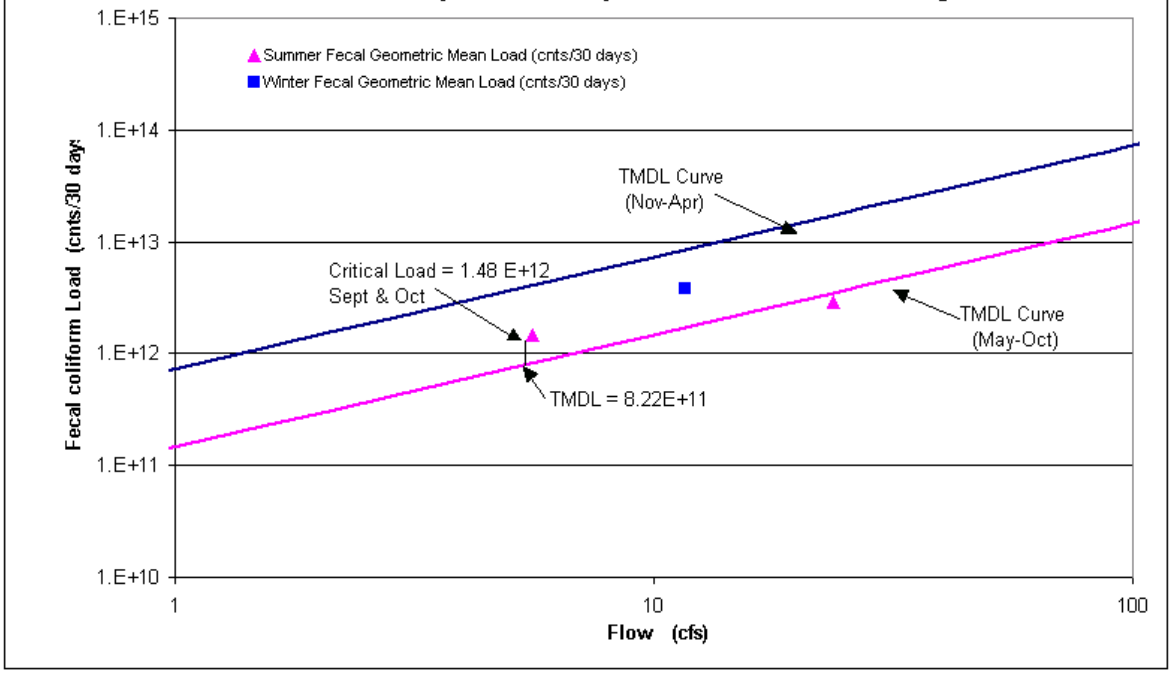



**Table A-40. Data for Figure A-40**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 31-Mar-99 | 330 | 33.0 | | | | |
| 15-Apr-99 | 1100 | 9.0 | | | | |
| 22-Apr-99 | 460 | 2.6 | | | | |
| 29-Apr-99 | 230 | 1.8 | 443 | 11.6 | 3.77E+12 | 8.51E+12 |
| 24-Jun-99 | 330 | 21.0 | | | | |
| 1-Jul-99 | 170 | 13.0 | | | | |
| 15-Jul-99 | 80 | 56.0 | | | | |
| 22-Jul-99 | 170 | 5.1 | 166 | 23.8 | 2.90E+12 | 3.49E+12 |
| 23-Sep-99 | 1300 | 1.8 | | | | |
| 30-Sep-99 | 170 | 4.0 | | | | |
| 7-Oct-99 | 230 | 14.0 | | | | |
| 21-Oct-99 | 330 | 2.6 | 360 | 5.6 | 1.48E+12 | 8.22E+11 |

**Figure A-41**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02212754 Rum Creek at Blue Store Road (County Road 193) near Forsyth,**

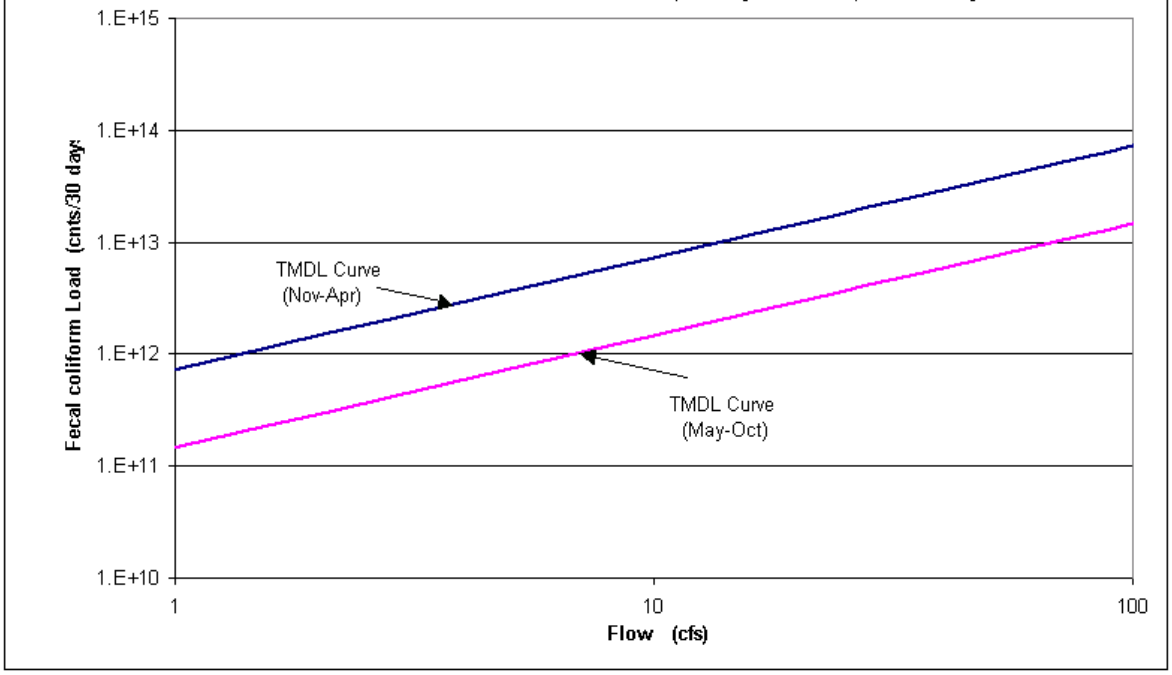



**Table A-41. Data for Figure A-41**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 4-Feb-04 | 80 | 7.4 | | | | |
| **12-Feb-04** | **24000** | **13.0** | | | | |
| 19-Feb-04 | 170 | 12.0 | | | | |
| 24-Feb-04 | 230 | 11.0 | 523 | 10.9 | 4.17E+12 | 7.96E+12 |
| 17-Mar-04 | 330 | 7.6 | | | | |
| 25-Mar-04 | 90 | 6.6 | | | | |
| 29-Mar-04 | 220 | 6.0 | | | | |
| 15-Apr-04 | 490 | 5.1 | 238 | 6.3 | 1.10E+12 | 4.64E+12 |
| 15-Jun-04 | 1300 | 3.5 | | | | |
| 17-Jun-04 | 1300 | 3.5 | | | | |
| 24-Jun-04 | 9000 | 13.0 | 2478 | 6.7 | 1.21E+13 | 4.89E+12 |

**Figure A-42**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Shetley Creek Headwaters to Bromolow Creek (Gwinnett Co)**

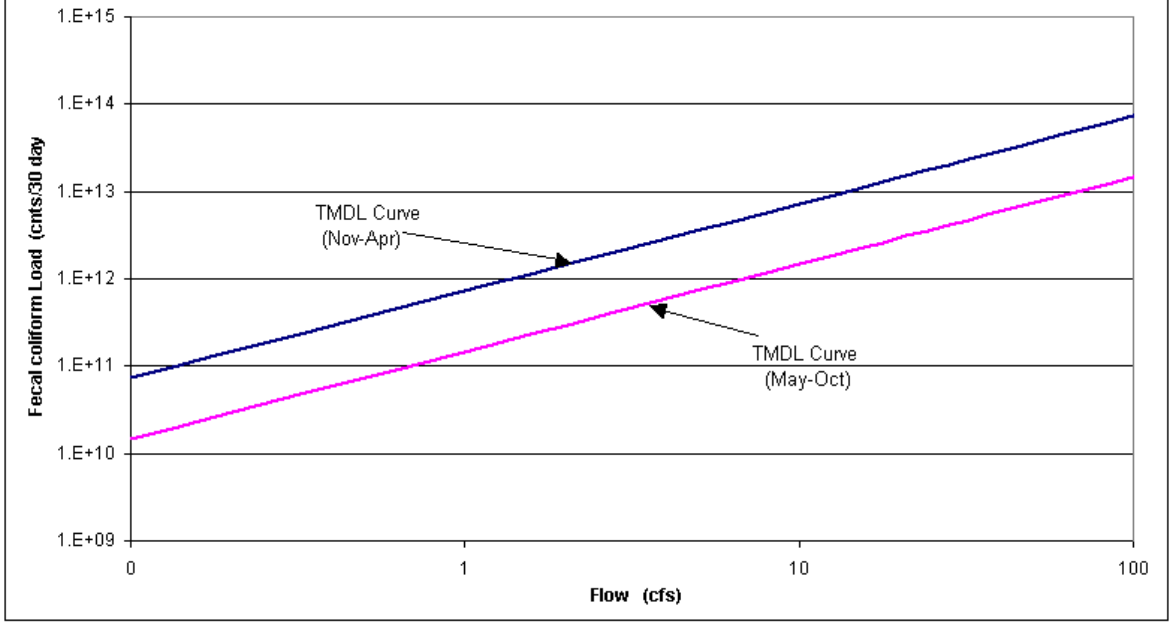



**Table A-42. Data for Figure A-42**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 1-Mar-04 | 4611 | 1.7 | | | | |
| 8-Mar-04 | 345 | 1.5 | | | | |
| 15-Mar-04 | 20 | 1.4 | | | | |
| 31-Mar-04 | 300 | 1.7 | 313 | 2 | 3.60E+11 | 1.15E+12 |
| 1-Jul-04 | 220 | 5.2 | | | | |
| 8-Jul-04 | 800 | 2.2 | | | | |
| 15-Jul-04 | 230 | 1.0 | | | | |
| 31-Jul-04 | 2400 | 1.2 | 558 | 2 | 9.89E+11 | 3.54E+11 |
| 1-Sep-04 | 500 | 1.3 | | | | |
| 8-Sep-04 | 300 | 27.4 | | | | |
| 15-Sep-04 | 270 | 1.0 | | | | |
| 30-Sep-04 | 300 | 3.1 | 332 | 8 | 2.00E+12 | 1.20E+12 |
| 1-Jan-05 | 300 | 1.6 | | | | |
| 8-Jan-05 | 130 | 1.6 | | | | |
| 15-Jan-05 | 1300 | 2.8 | | | | |
| 31-Jan-05 | 40 | 2.6 | 212 | 2 | 3.35E+11 | 1.58E+12 |
| 1-Apr-05 | 40 | 23.2 | | | | |
| 8-Apr-05 | 5000 | 7.3 | | | | |
| 15-Apr-05 | 130 | 2.0 | | | | |
| 30-Apr-05 | 170 | 9.0 | 258 | 10 | 1.96E+12 | 7.62E+12 |
| 1-Jun-05 | 130 | 4.8 | | | | |
| 8-Jun-05 | 800 | 1.9 | | | | |
| 15-Jun-05 | 300 | 1.7 | | | | |
| 30-Jun-05 | 1100 | 1.2 | 430 | 2 | 7.58E+11 | 3.52E+11 |
| 1-Oct-05 | 300 | 1.0 | | | | |
| 8-Oct-05 | 500 | 14.6 | | | | |
| 15-Oct-05 | 70 | 1.3 | | | | |
| 31-Oct-05 | 230 | 1.1 | 222 | 5 | 7.33E+11 | 6.61E+11 |
| 1-Dec-05 | 70 | 1.5 | | | | |
| 8-Dec-05 | 40 | 1.8 | | | | |
| 15-Dec-05 | 230 | 8.0 | | | | |
| 31-Dec-05 | 20 | 1.4 | 60 | 3 | 1.40E+11 | 2.33E+12 |

**Figure A-43**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Shoal Creek Headwaters to Alcovy River, Lawrenceville (Gwinnett Co)**

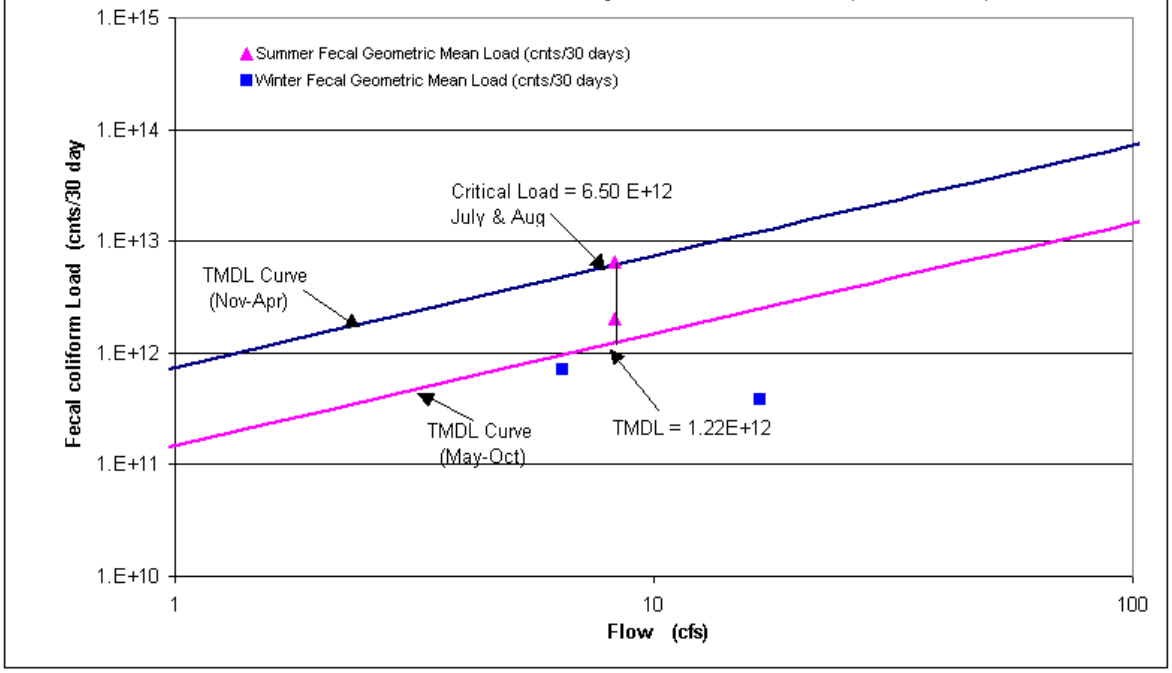



**Table A-43. Data for Figure A-43**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 13-Jan-04 | 20 | 7.4 | | | | |
| 28-Jan-04 | 80 | 31.9 | | | | |
| 2-Feb-04 | 20 | 10.6 | 32 | 16.6 | 3.87E+11 | 1.22E+13 |
| 13-Apr-04 | 2400 | 8.0 | | | | |
| 19-Apr-04 | 80 | 6.5 | | | | |
| 21-Apr-04 | 20 | 5.6 | | | | |
| 28-Apr-04 | 140 | 5.5 | 152 | 6.4 | 7.19E+11 | 4.72E+12 |
| 20-Jul-04 | 130 | 4.1 | | | | |
| 26-Jul-04 | 9000 | 16.5 | | | | |
| 28-Jul-04 | 5000 | 9.1 | | | | |
| 3-Aug-04 | 220 | 3.6 | 1065 | 8.3 | 6.50E+12 | 1.22E+12 |
| 18-Oct-04 | 70 | 5.9 | | | | |
| 20-Oct-04 | 3000 | 12.7 | | | | |
| 25-Oct-04 | 110 | 7.7 | | | | |
| 27-Oct-04 | 500 | 6.9 | 328 | 8.3 | 2.00E+12 | 1.22E+12 |

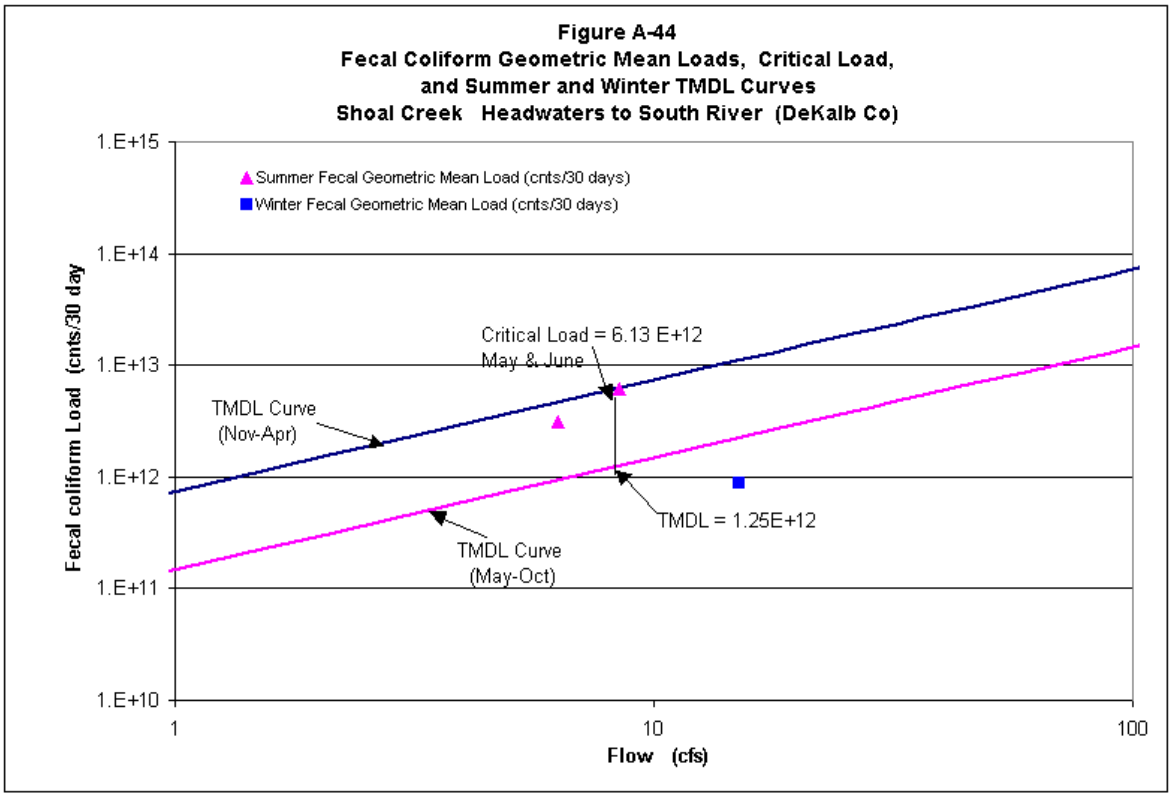



**Table A-44. Data for Figure A-44**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 16-Feb-04 | 70 | 27.7 | | | | |
| 23-Feb-04 | 130 | 11.1 | | | | |
| 1-Mar-04 | 110 | 11.1 | | | | |
| 8-Mar-04 | 40 | 10.2 | 80 | 15.0 | 8.77E+11 | 1.10E+13 |
| 17-May-04 | 500 | 8.1 | | | | |
| 24-May-04 | 260 | 7.2 | | | | |
| 1-Jun-04 | 3000 | 10.5 | | | | |
| 8-Jun-04 | 2400 | 8.1 | 984 | 8.5 | 6.13E+12 | 1.25E+12 |
| 23-Aug-04 | 600 | 6.3 | | | | |
| 30-Aug-04 | 1700 | 5.9 | | | | |
| 15-Sep-04 | 300 | 6.8 | 674 | 6.3 | 3.13E+12 | 9.28E+11 |

**Figure A-45**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Snapfinger Creek DeKalb County**

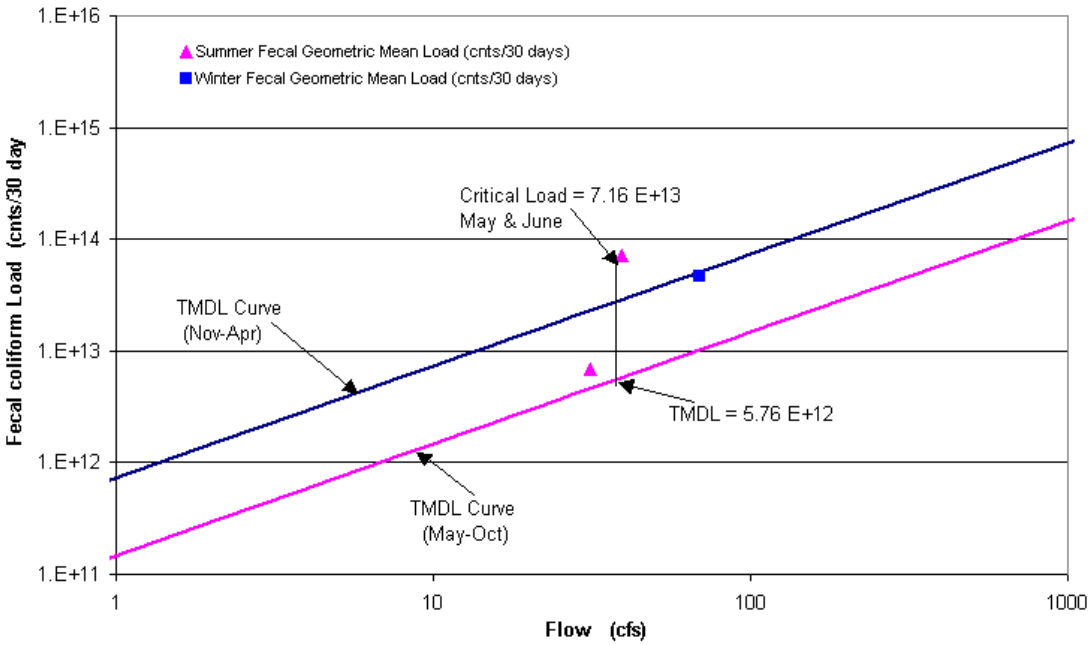



**Table A-45. Data for Figure A-45**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 16-Feb-04 | 500 | 128.1 | | | | |
| 23-Feb-04 | 1700 | 51.2 | | | | |
| 1-Mar-04 | 1700 | 51.4 | | | | |
| 8-Mar-04 | 500 | 47.3 | 922 | 69.5 | 4.70E+13 | 5.10E+13 |
| 17-May-04 | 2400 | 37.6 | | | | |
| 24-May-04 | 2200 | 33.2 | | | | |
| 1-Jun-04 | 3000 | 48.6 | | | | |
| 8-Jun-04 | 2400 | 37.6 | 2483 | 39.3 | 7.16E+13 | 5.76E+12 |
| 23-Aug-04 | 300 | 29.2 | | | | |
| 30-Aug-04 | 800 | 27.1 | | | | |
| 15-Sep-04 | 140 | 31.5 | 533 | 31.3 | 6.93E+12 | 4.29E+12 |

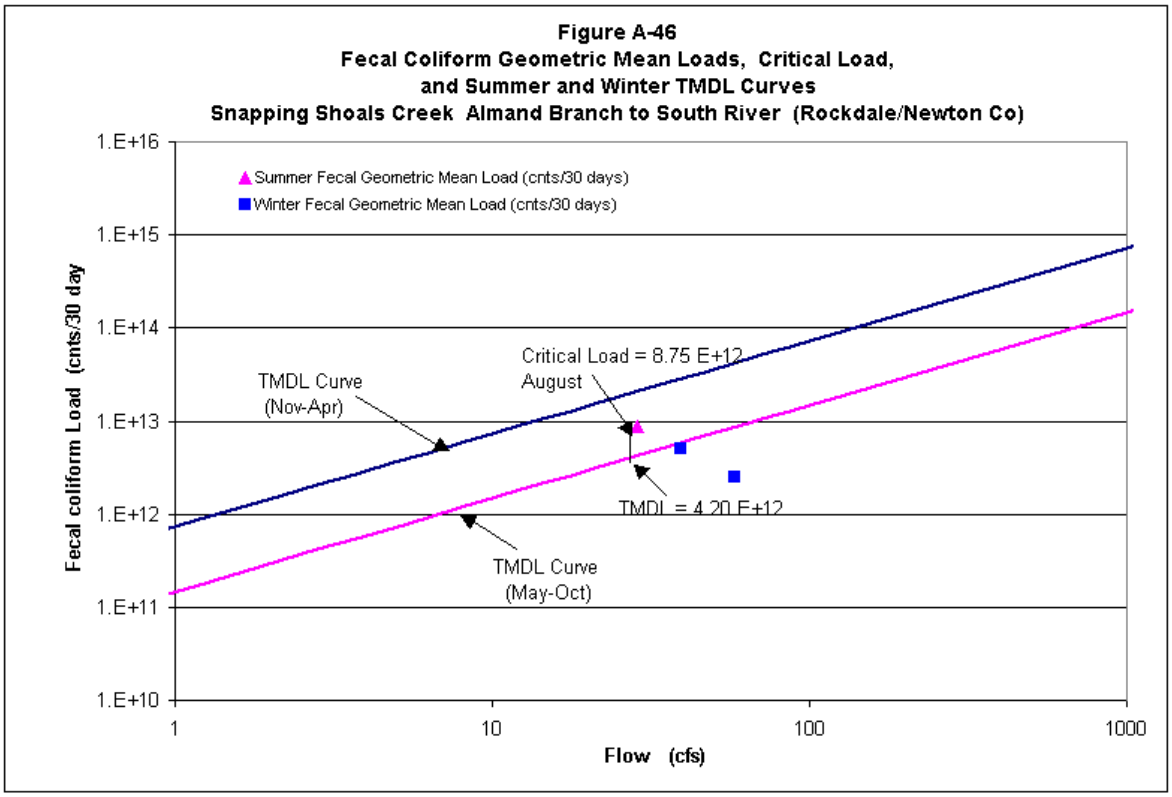



**Table A-46. Data for Figure A-46**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 17-Feb-04 | 40 | 82.7 | | | | |
| 24-Feb-04 | 90 | 52.8 | | | | |
| 2-Mar-04 | 80 | 51.1 | | | | |
| 9-Mar-04 | 40 | 45.9 | 58 | 58.1 | 2.48E+12 | 4.27E+13 |
| 18-May-04 | 300 | 50.9 | | | | |
| 2-Jun-04 | 170 | 33.8 | | | | |
| 9-Jun-04 | 110 | 32.9 | 178 | 39.2 | 5.11E+12 | 5.75E+12 |
| 17-Aug-04 | 300 | 31.6 | | | | |
| 24-Aug-04 | 800 | 27.7 | | | | |
| 31-Aug-04 | 300 | 26.6 | 416 | 28.6 | 8.75E+12 | 4.20E+12 |

**Figure A-47**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**South River Atlanta to Flakes Mill Road (Fulton/DeKalb Co)**

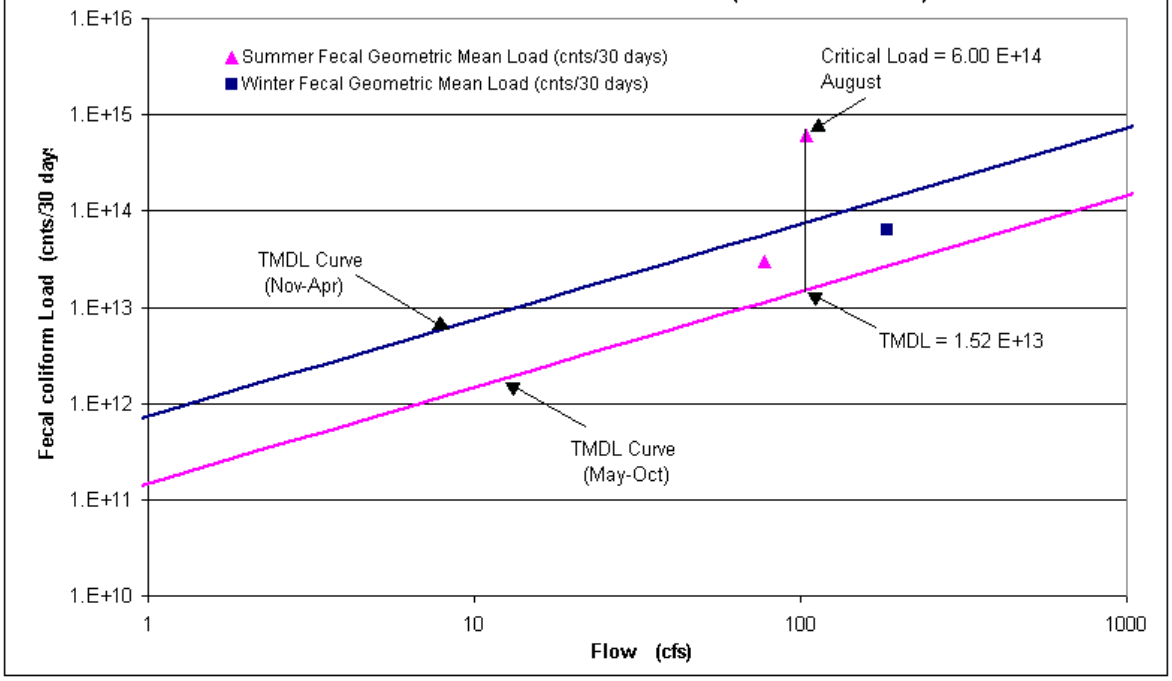



**Table A-47. Data for Figure A-47**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 16-Feb-04 | 800 | 338.7 | | | | |
| 23-Feb-04 | 5000 | 135.3 | | | | |
| 1-Mar-04 | 40 | 135.8 | | | | |
| 8-Mar-04 | 300 | 125.2 | 468 | 183.8 | 6.31E+13 | 1.35E+14 |
| 17-May-04 | 3000 | 99.5 | | | | |
| 24-May-04 | 16000 | 87.8 | | | | |
| 1-Jun-04 | 5000 | 128.6 | | | | |
| 8-Jun-04 | 16000 | 99.5 | 7872 | 103.8 | 6.00E+14 | 1.52E+13 |
| 23-Aug-04 | 800 | 77.1 | | | | |
| 30-Aug-04 | 800 | 71.5 | | | | |
| 15-Sep-04 | 230 | 83.3 | 528 | 77.3 | 3.00E+13 | 1.14E+13 |

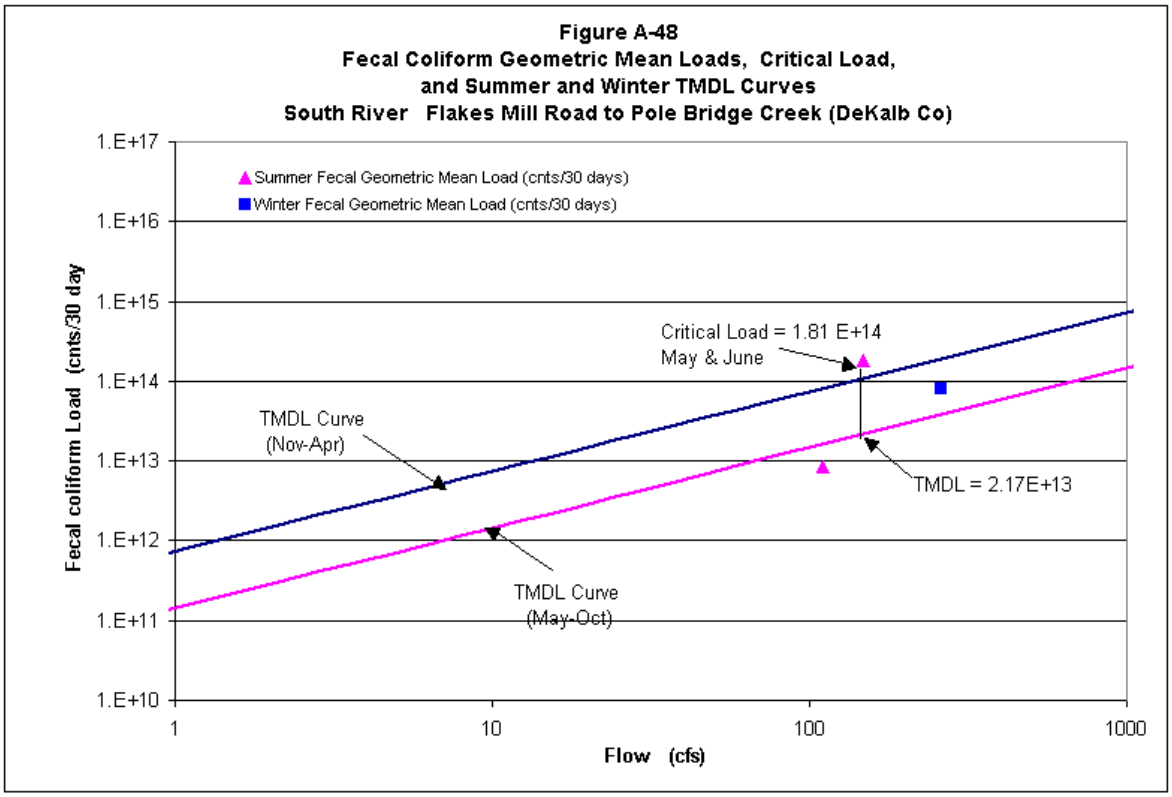



**Table A-48. Data for Figure A-48**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 16-Feb-04 | 500 | 481.8 | | | | |
| 23-Feb-04 | 140 | 192.4 | | | | |
| 1-Mar-04 | 800 | 193.2 | | | | |
| 8-Mar-04 | 500 | 178.1 | 409 | 261.4 | 7.85E+13 | 1.92E+14 |
| 17-May-04 | 2400 | 141.5 | | | | |
| 24-May-04 | 500 | 124.8 | | | | |
| 1-Jun-04 | 5000 | 182.9 | | | | |
| 8-Jun-04 | 1300 | 141.5 | 1671 | 147.7 | 1.81E+14 | 2.17E+13 |
| 23-Aug-04 | 70 | 109.7 | | | | |
| 30-Aug-04 | 70 | 101.8 | | | | |
| 15-Sep-04 | 230 | 118.5 | 104 | 110.0 | 8.40E+12 | 1.61E+13 |

**Figure A-49**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**South River Pole Bridge Creek to Hwy 20 (Rockdale/Newton Co)**

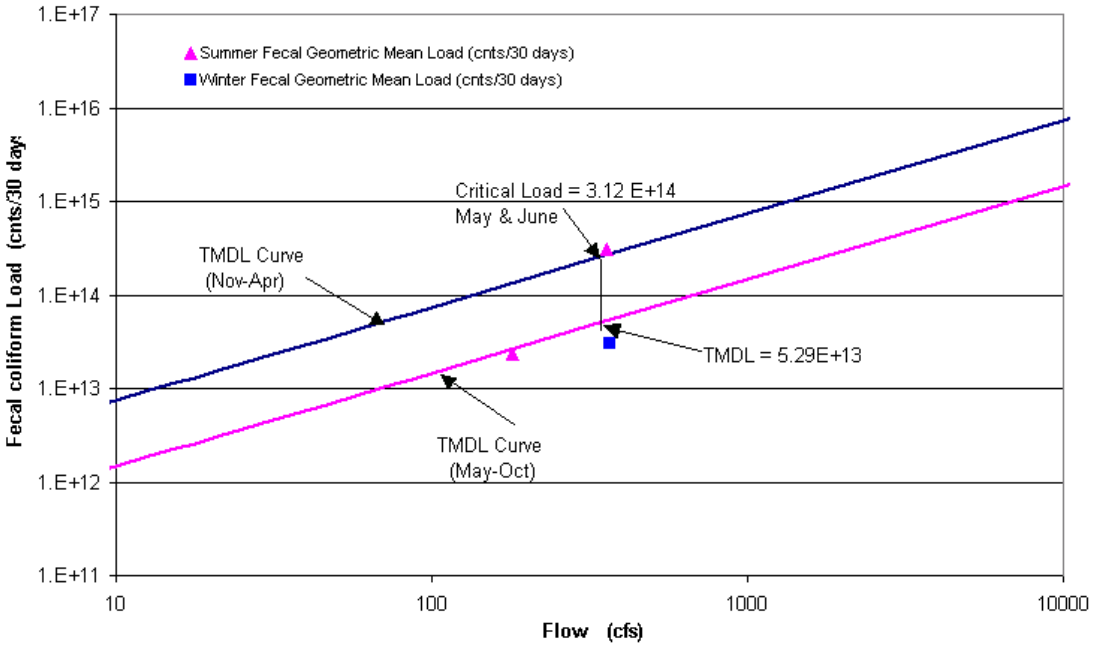



**Table A-49. Data for Figure A-49**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 17-Feb-04 | 130 | 520.1 | | | | |
| 24-Feb-04 | 80 | 332.2 | | | | |
| 2-Mar-04 | 230 | 321.3 | | | | |
| 9-Mar-04 | 70 | 288.6 | 114 | 365.5 | 3.05E+13 | 2.68E+14 |
| 18-May-04 | 500 | 319.9 | | | | |
| 2-Jun-04 | 1100 | 212.4 | | | | |
| 9-Jun-04 | 220 | 206.9 | | | | |
| 16-Jun-04 | 16000 | 702.5 | 1180 | 360.4 | 3.12E+14 | 5.29E+13 |
| 17-Aug-04 | 300 | 198.8 | | | | |
| 24-Aug-04 | 170 | 174.3 | | | | |
| 31-Aug-04 | 110 | 167.5 | 178 | 180.2 | 2.35E+13 | 2.64E+13 |

**Figure A-50**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**South River Hwy 20 to Snapping Shoals Creek (Henry/Newton Co)**

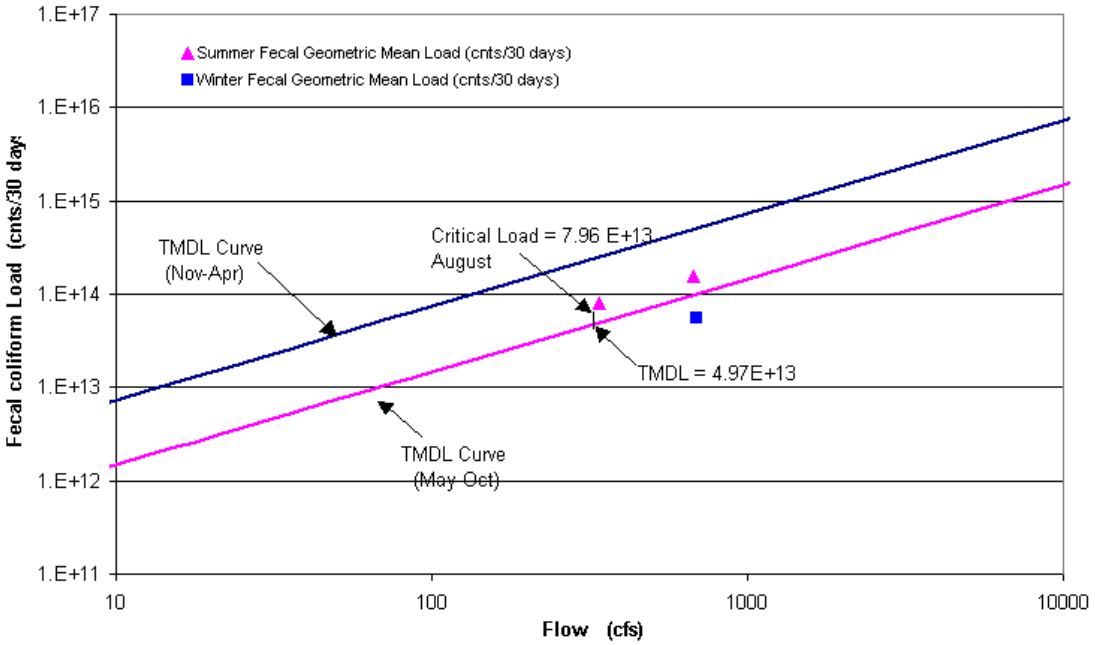



**Table A-50. Data for Figure A-50**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 17-Feb-04 | 230 | 976.6 | | | | |
| 24-Feb-04 | 40 | 623.8 | | | | |
| 2-Mar-04 | 130 | 603.4 | | | | |
| 9-Mar-04 | 130 | 542.0 | 112 | 686.4 | 5.63E+13 | 5.04E+14 |
| 18-May-04 | 170 | 600.8 | | | | |
| 2-Jun-04 | 220 | 398.8 | | | | |
| 9-Jun-04 | 230 | 388.6 | | | | |
| 16-Jun-04 | 1100 | 1319.2 | 312 | 676.9 | 1.55E+14 | 9.94E+13 |
| 17-Aug-04 | 130 | 373.3 | | | | |
| 24-Aug-04 | 230 | 327.2 | | | | |
| 31-Aug-04 | 1100 | 314.5 | 320 | 338.3 | 7.96E+13 | 4.97E+13 |

**Figure A-51**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02204810 South River at Island Shoals Road near Snapping Shoals, Georgia**

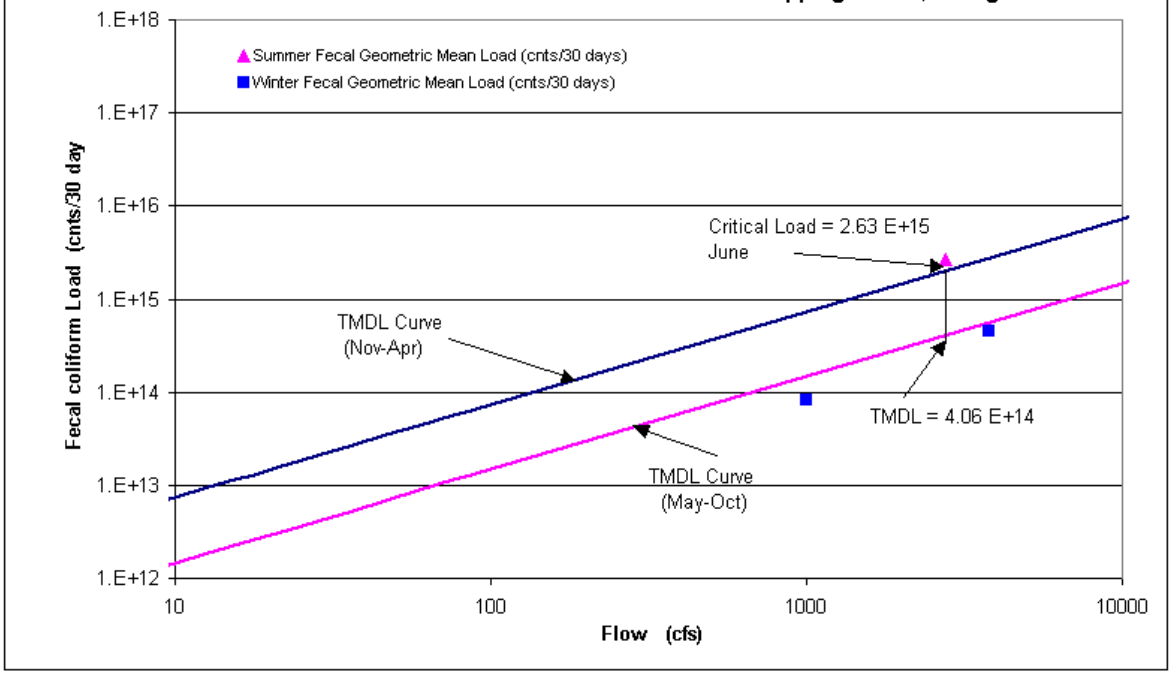



**Table A-51. Data for Figure A-51**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 12-Feb-04 | 1300 | 9004.3 | | | | |
| 19-Feb-04 | 80 | 1312.9 | | | | |
| 24-Feb-04 | 40 | 1082.3 | 161 | 3799.8 | 4.49E+14 | 2.79E+15 |
| 17-Mar-04 | 70 | 896.0 | | | | |
| 25-Mar-04 | 40 | 816.2 | | | | |
| 30-Mar-04 | 110 | 1255.3 | | | | |
| 15-Apr-04 | 490 | 1024.6 | 111 | 998.0 | 8.12E+13 | 7.33E+14 |
| 15-Jun-04 | 300 | 1193.2 | | | | |
| 17-Jun-04 | 3000 | 3827.9 | | | | |
| 24-Jun-04 | 2400 | 3282.3 | 1293 | 2767.8 | 2.63E+15 | 4.06E+14 |

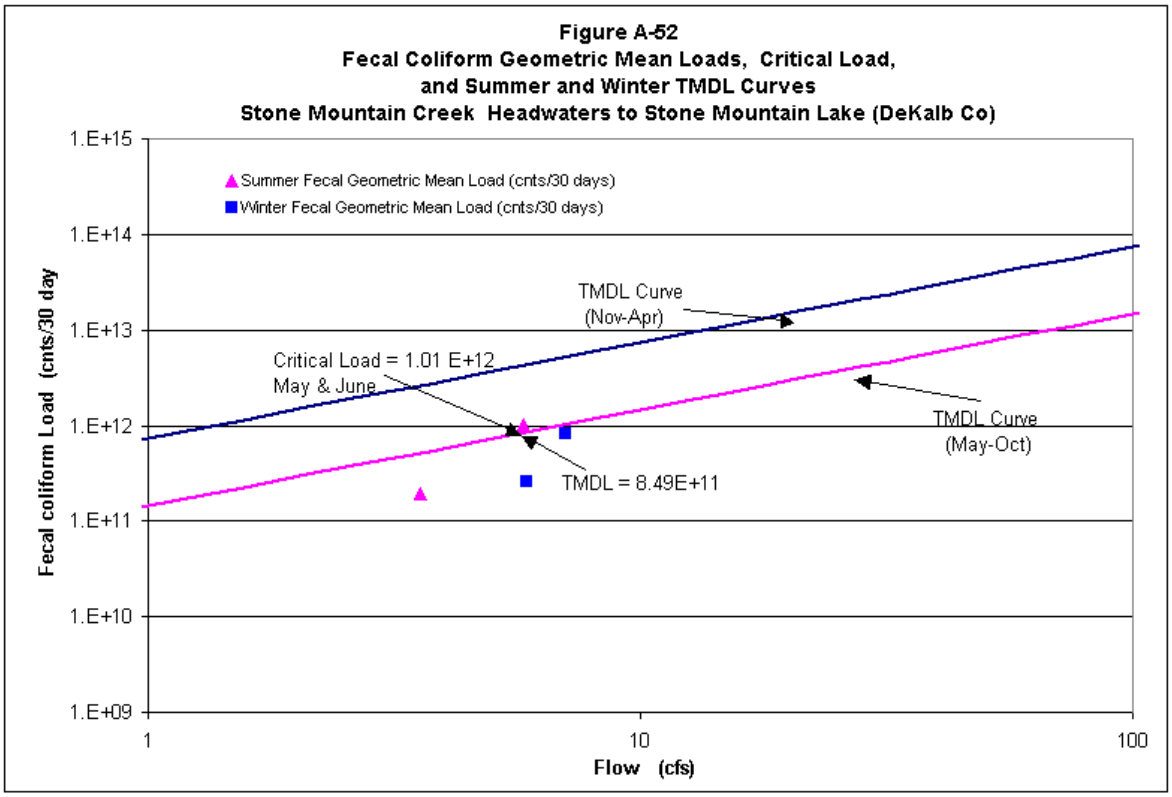



**Table A-52. Data for Figure A-52**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 18-Feb-04 | 145 | 7.4 | | | | |
| 25-Feb-04 | 41 | 5.8 | | | | |
| 3-Mar-04 | 41 | 5.2 | | | | |
| 10-Mar-04 | 52 | 5.1 | 60 | 5.9 | 2.57E+11 | 4.30E+12 |
| 19-May-04 | 135 | 3.9 | | | | |
| 26-May-04 | 119 | 3.2 | | | | |
| 7-Jun-04 | 40 | 2.9 | | | | |
| 14-Jun-04 | 5000 | 13.2 | 238 | 5.8 | 1.01E+12 | 8.49E+11 |
| 18-Aug-04 | 110 | 3.1 | | | | |
| 25-Aug-04 | 40 | 3.2 | | | | |
| 1-Sep-04 | 170 | 4.3 | | | | |
| 13-Sep-04 | 40 | 3.7 | 74 | 3.6 | 1.94E+11 | 5.25E+11 |
| 10-Nov-04 | 40 | 4.4 | | | | |
| 17-Nov-04 | 230 | 4.6 | | | | |
| 1-Dec-04 | 457 | 9.7 | | | | |
| 7-Dec-04 | 145 | 9.6 | 157 | 7.0 | 8.13E+11 | 5.17E+12 |

**Figure A-53**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Sugar Creek U/S Memorial Drive to South River (DeKalb Co)**

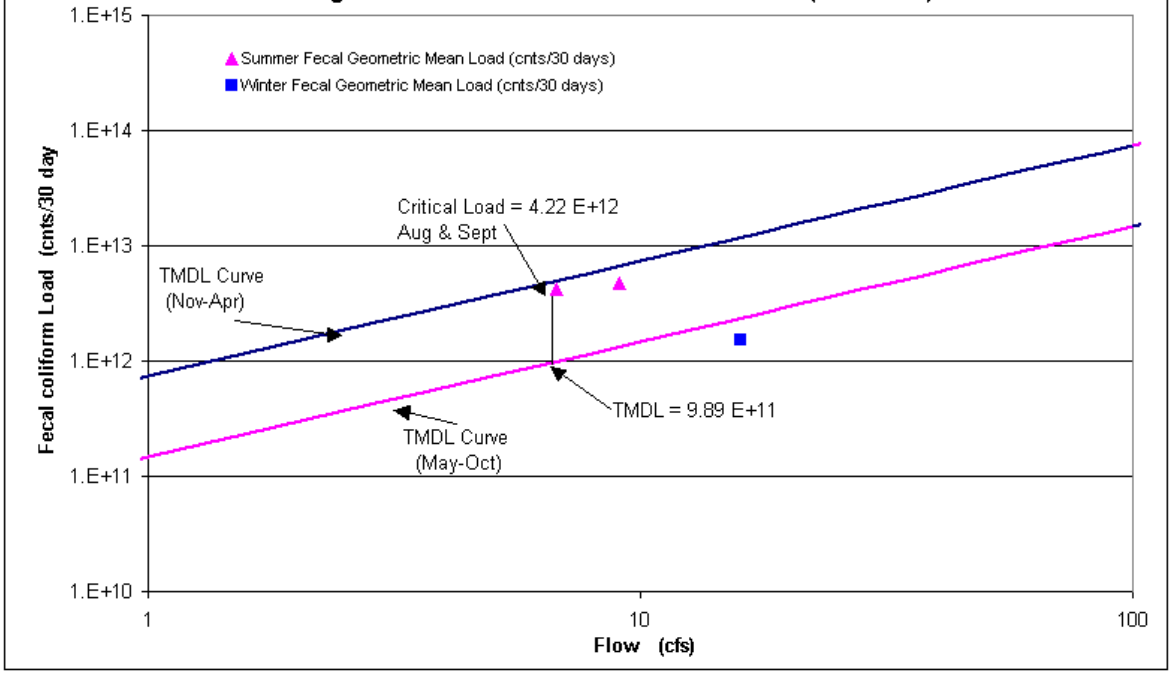



**Table A-53. Data for Figure A-53**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 16-Feb-04 | 300 | 29.5 | | | | |
| 23-Feb-04 | 60 | 11.8 | | | | |
| 1-Mar-04 | 20 | 11.8 | | | | |
| 8-Mar-04 | 800 | 10.9 | 130 | 16.0 | 1.53E+12 | 1.17E+13 |
| 17-May-04 | 110 | 8.7 | | | | |
| 24-May-04 | 110 | 7.6 | | | | |
| 1-Jun-04 | 16000 | 11.2 | | | | |
| 8-Jun-04 | 1300 | 8.7 | 708 | 9.0 | 4.70E+12 | 1.33E+12 |
| 23-Aug-04 | 300 | 6.7 | | | | |
| 30-Aug-04 | 16000 | 6.2 | | | | |
| 15-Sep-04 | 130 | 7.3 | 855 | 6.7 | 4.22E+12 | 9.89E+11 |

**Figure A-54**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02216190 Sugar Creek at State Road 27 near Lumber City, Georgia**

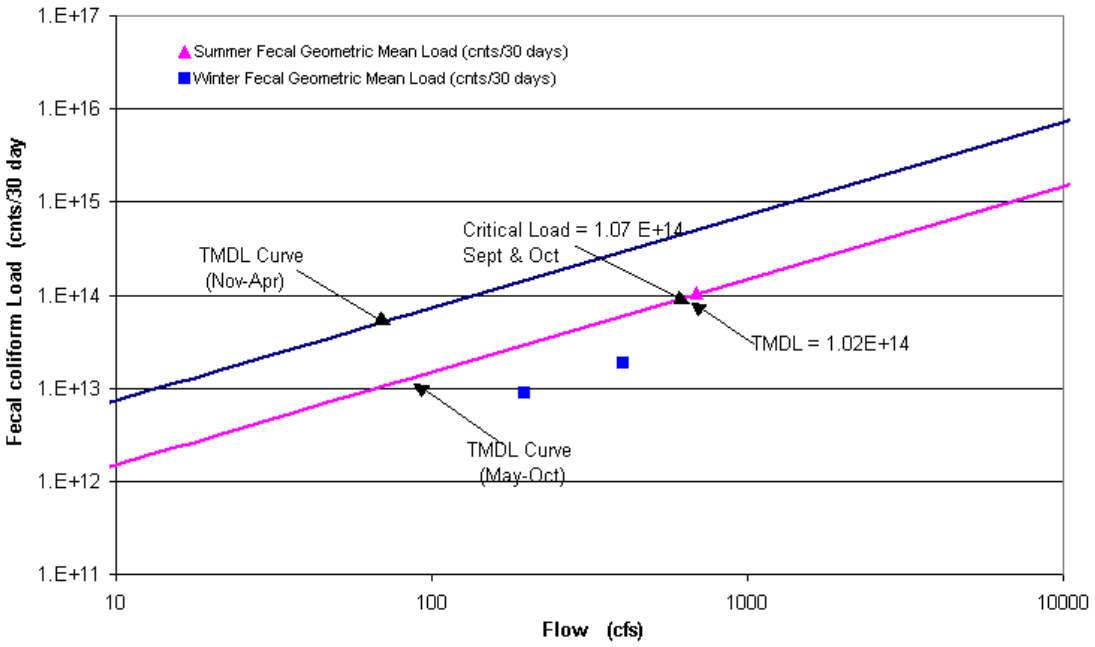



**Table A-54. Data for Figure A-54**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 17-Feb-04 | 130 | 1120.0 | | | | |
| 1-Mar-04 | 70 | 338.0 | | | | |
| 8-Mar-04 | 40 | 106.0 | | | | |
| 15-Mar-04 | 40 | 55.0 | 62 | 404.8 | 1.84E+13 | 2.97E+14 |
| 12-Jul-04 | 20 | 1.5 | | | | |
| 21-Jul-04 | 20 | 1.4 | | | | |
| 28-Jul-04 | 20 | 1.3 | 20 | 1.4 | 2.06E+10 | 2.06E+11 |
| 13-Sep-04 | 800 | 327.5 | | | | |
| 22-Sep-04 | 130 | 103.0 | | | | |
| 29-Sep-04 | 170 | 1800.0 | | | | |
| 4-Oct-04 | 110 | 536.0 | 210 | 691.6 | 1.07E+14 | 1.02E+14 |
| 1-Nov-04 | 40 | 309.0 | | | | |
| 8-Nov-04 | 130 | 420.0 | | | | |
| 16-Nov-04 | 40 | 31.0 | | | | |
| 18-Nov-04 | 70 | 25.0 | 62 | 196.3 | 8.90E+12 | 1.44E+14 |

**Figure A-55**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Sweetwater Creek Lee Daniel Creek to Yellow River (Gwinnett Co)**

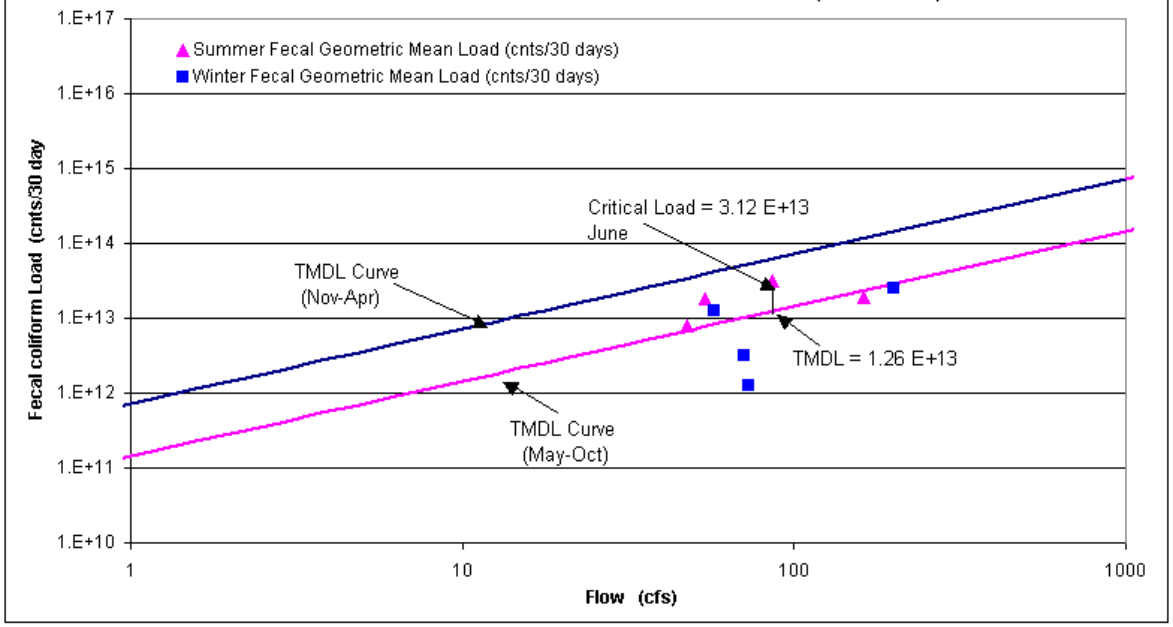



**Table A-55. Data for Figure A-55**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 10-Mar-04 | 3654 | 60.7 | | | | |
| 17-Mar-04 | 143 | 54.5 | | | | |
| 24-Mar-04 | 170 | 49.6 | | | | |
| 31-Mar-04 | 80 | 66.1 | 290 | 58 | 1.23E+13 | 4.24E+13 |
| 10-Jul-04 | 300 | 72.6 | | | | |
| 17-Jul-04 | 230 | 39.4 | | | | |
| 24-Jul-04 | 220 | 33.5 | | | | |
| 31-Jul-04 | 170 | 45.9 | 225 | 48 | 7.91E+12 | 7.02E+12 |
| 9-Sep-04 | 210 | 97.4 | | | | |
| 16-Sep-04 | 130 | 356.2 | | | | |
| 23-Sep-04 | 300 | 75.6 | | | | |
| 30-Sep-04 | 80 | 122.0 | 160 | 163 | 1.91E+13 | 2.39E+13 |
| 10-Jan-05 | 20 | 57.5 | | | | |
| 17-Jan-05 | 40 | 72.0 | | | | |
| 24-Jan-05 | 20 | 62.1 | | | | |
| 31-Jan-05 | 20 | 100.6 | 24 | 73 | 1.28E+12 | 5.36E+13 |
| 9-Apr-05 | 170 | 140.3 | | | | |
| 16-Apr-05 | 170 | 76.1 | | | | |
| 23-Apr-05 | 170 | 228.3 | | | | |
| 30-Apr-05 | 170 | 353.5 | 170 | 200 | 2.49E+13 | 1.46E+14 |
| 9-Jun-05 | 500 | 179.4 | | | | |
| 16-Jun-05 | 300 | 58.3 | | | | |
| 23-Jun-05 | 500 | 59.4 | | | | |
| 30-Jun-05 | 800 | 47.0 | 495 | 86 | 3.12E+13 | 1.26E+13 |
| 10-Oct-05 | 800 | 76.9 | | | | |
| 17-Oct-05 | 800 | 48.0 | | | | |
| 24-Oct-05 | 300 | 46.7 | | | | |
| 31-Oct-05 | 230 | 44.5 | 458 | 54 | 1.82E+13 | 7.93E+12 |
| 10-Dec-05 | 80 | 70.4 | | | | |
| 17-Dec-05 | 40 | 99.3 | | | | |
| 24-Dec-05 | 110 | 57.7 | | | | |
| 31-Dec-05 | 40 | 56.4 | 61 | 71 | 3.19E+12 | 5.21E+13 |

**Figure A-56**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Swift Creek Headwaters to Yellow River (DeKalb Co)**

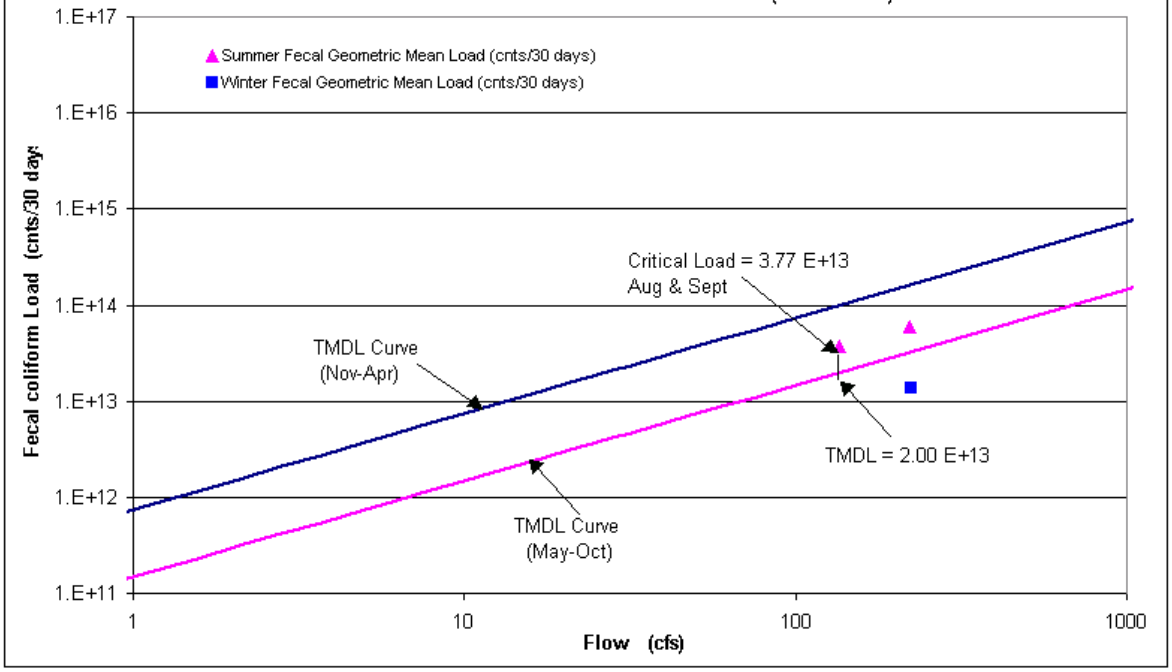



**Table A-56. Data for Figure A-56**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 18-Feb-04 | 40 | 282.1 | | | | |
| 25-Feb-04 | 110 | 220.0 | | | | |
| 3-Mar-04 | 140 | 197.5 | | | | |
| 10-Mar-04 | 80 | 194.1 | 84 | 223.4 | 1.37E+13 | 1.64E+14 |
| 19-May-04 | 80 | 147.5 | | | | |
| 26-May-04 | 300 | 120.8 | | | | |
| 7-Jun-04 | 300 | 109.6 | | | | |
| 14-Jun-04 | 2400 | 503.8 | 363 | 220.4 | 5.87E+13 | 3.24E+13 |
| 18-Aug-04 | 700 | 119.9 | | | | |
| 25-Aug-04 | 130 | 123.4 | | | | |
| 1-Sep-04 | 1300 | 162.2 | | | | |
| 13-Sep-04 | 170 | 139.7 | 377 | 136.3 | 3.77E+13 | 2.00E+13 |

**Figure A-57**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02213285 Tobesofkee Creek at Ramah Church Road near Barnesville, Georgia**

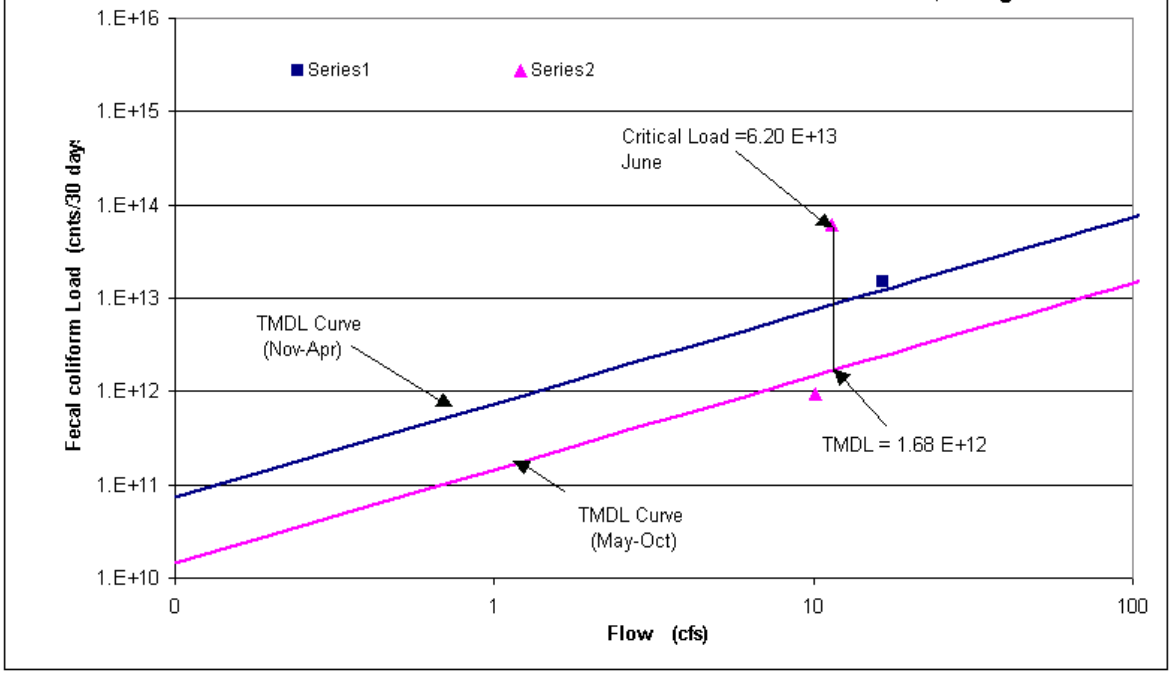



**Table A-57. Data for Figure A-57**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 4-Feb-04 | 130 | 14.0 | | | | |
| 12-Feb-04 | 17000 | 19.0 | | | | |
| 19-Feb-04 | 790 | 16.0 | | | | |
| 24-Feb-04 | 1300 | 17.0 | 1227 | 16.5 | 1.49E+13 | 1.21E+13 |
| 17-Mar-04 | 220 | 12.0 | | | | |
| 25-Mar-04 | 80 | 9.2 | | | | |
| 29-Mar-04 | 300 | 10.0 | | | | |
| 15-Apr-04 | 50 | 9.2 | 127 | 10.1 | 9.45E+11 | 7.41E+12 |
| 15-Jun-04 | 16000 | 9.2 | | | | |
| 17-Jun-04 | 5000 | 9.2 | | | | |
| 24-Jun-04 | 5000 | 16.0 | 7368 | 11.5 | 6.20E+13 | 1.68E+12 |

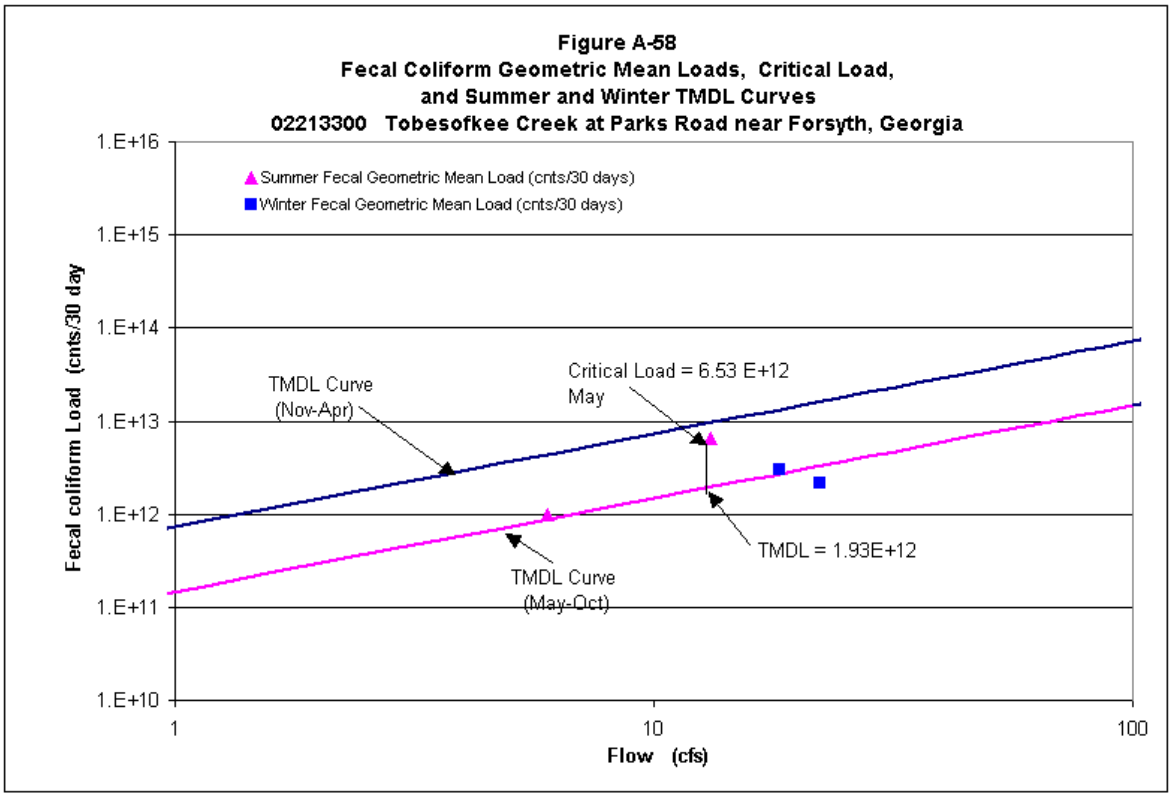



**Table A-58. Data for Figure A-58**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 2-Mar-04 | 800 | 27.0 | | | | |
| 3-Mar-04 | 220 | 26.0 | | | | |
| 18-Mar-04 | 20 | 20.0 | | | | |
| 23-Mar-04 | 80 | 16.0 | 130 | 22.3 | 2.12E+12 | 1.63E+13 |
| 6-May-04 | 300 | 12.0 | | | | |
| 13-May-04 | 9000 | 24.0 | | | | |
| 19-May-04 | 300 | 9.6 | | | | |
| 27-May-04 | 260 | 6.9 | 677 | 13.1 | 6.53E+12 | 1.93E+12 |
| 4-Aug-04 | 80 | 6.0 | | | | |
| 12-Aug-04 | 300 | 6.0 | | | | |
| 18-Aug-04 | 140 | 6.0 | | | | |
| 23-Aug-04 | 700 | 6.0 | 220 | 6.0 | 9.70E+11 | 8.81E+11 |
| 18-Nov-04 | 220 | 14.0 | | | | |
| 22-Nov-04 | 500 | 14.0 | | | | |
| 2-Dec-04 | 300 | 25.0 | | | | |
| 8-Dec-04 | 80 | 20.0 | 227 | 18.3 | 3.04E+12 | 1.34E+13 |

**Figure A-59**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02213560 Tobesofkee Creek - U.S. Highways 41 and 129**

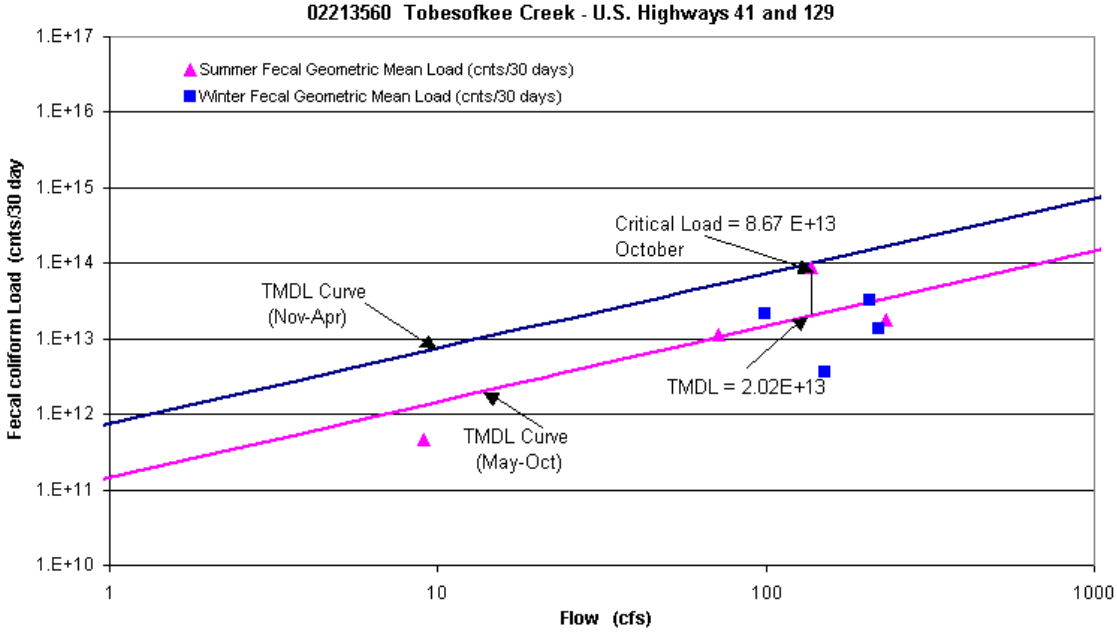



**Table A-59. Data for Figure A-59**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 8-Jan-02 | 200 | 12.8 | | | | |
| 15-Jan-02 | 170 | 17.5 | | | | |
| 22-Jan-02 | 800 | 226.1 | | | | |
| 29-Jan-02 | 270 | 141.0 | 293 | 99.3 | 2.13E+13 | 7.29E+13 |
| 1-Apr-02 | 1300 | 313.5 | | | | |
| 8-Apr-02 | 300 | 181.8 | | | | |
| 15-Apr-02 | 40 | 179.5 | | | | |
| 22-Apr-02 | 130 | 152.7 | 212 | 206.8 | 3.22E+13 | 1.52E+14 |
| 15-Jul-02 | 20 | 7.1 | | | | |
| 23-Jul-02 | 40 | 6.6 | | | | |
| 30-Jul-02 | 140 | 10.7 | | | | |
| 1-Aug-02 | 220 | 11.7 | 70 | 9.0 | 4.67E+11 | 1.33E+12 |
| 1-Oct-02 | 490 | 5.0 | | | | |
| 8-Oct-02 | 210 | 5.1 | | | | |
| 15-Oct-02 | 1700 | 531.4 | | | | |
| 22-Oct-02 | 3100 | 9.2 | 858 | 137.7 | 8.67E+13 | 2.02E+13 |
| 13-Jan-03 | 75 | 43.1 | | | | |
| 27-Jan-03 | 20 | 11.7 | | | | |
| 3-Feb-03 | 20 | 83.9 | | | | |
| 13-Feb-03 | 40 | 468.4 | 33 | 151.8 | 3.69E+12 | 1.11E+14 |
| 10-Apr-03 | 130 | 461.4 | | | | |
| 16-Apr-03 | 40 | 36.1 | | | | |
| 22-Apr-03 | 220 | 219.1 | | | | |
| 24-Apr-03 | 40 | 166.6 | 82 | 220.8 | 1.33E+13 | 1.62E+14 |
| 14-Jul-03 | 300 | 467.3 | | | | |
| 21-Jul-03 | 130 | 59.4 | | | | |
| 28-Jul-03 | 40 | 250.5 | | | | |
| 4-Aug-03 | 80 | 153.8 | 106 | 232.8 | 1.81E+13 | 3.42E+13 |
| 15-Oct-03 | 1300 | 162.0 | | | | |
| 21-Oct-03 | 300 | 17.5 | | | | |
| 27-Oct-03 | 20 | 57.1 | | | | |
| 29-Oct-03 | 300 | 48.9 | 220 | 71.4 | 1.15E+13 | 1.05E+13 |

**Figure A-60**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Towaliga River Indian Creek to High Falls Lake (Butt Co)**

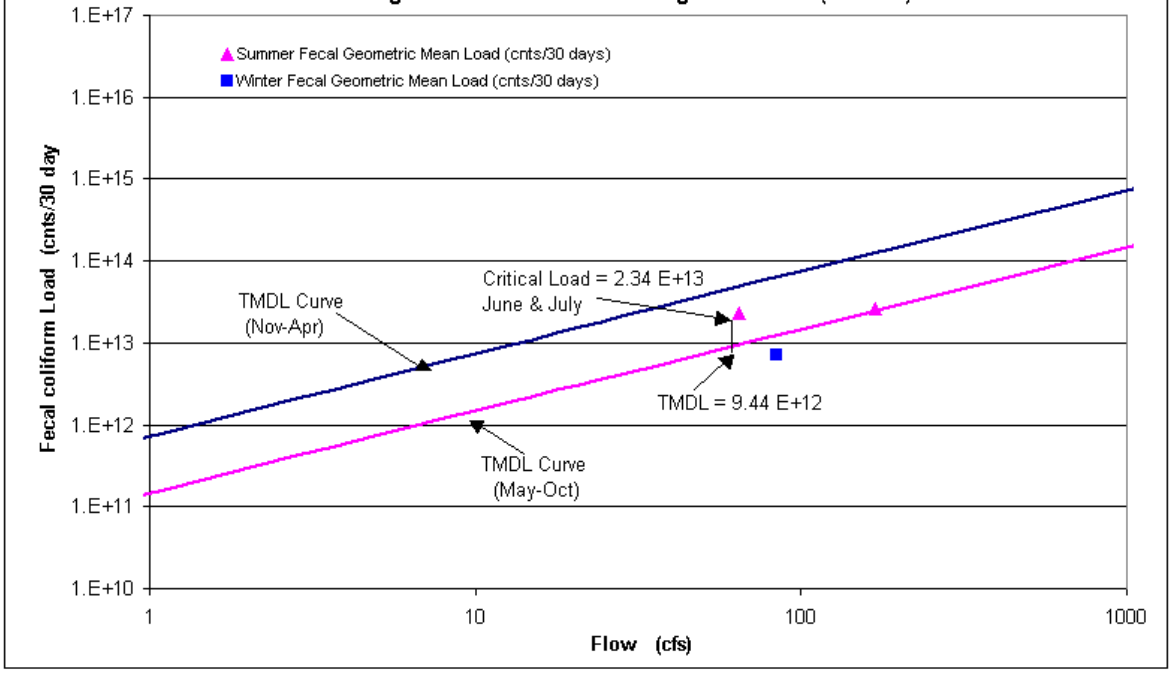



**Table A-60. Data for Figure A-60**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 15-Mar-04 | 80 | 102.0 | | | | |
| 22-Mar-04 | 130 | 80.0 | | | | |
| 29-Mar-04 | 130 | 99.6 | | | | |
| 5-Apr-04 | 130 | 53.9 | 115 | 83.9 | 7.09E+12 | 6.16E+13 |
| 21-Jun-04 | 170 | 18.0 | | | | |
| 28-Jun-04 | 1700 | 175.5 | | | | |
| 6-Jul-04 | 300 | 50.6 | | | | |
| 13-Jul-04 | 700 | 13.1 | 496 | 64.3 | 2.34E+13 | 9.44E+12 |
| 14-Sep-04 | 300 | 448.2 | | | | |
| 22-Sep-04 | 170 | 80.8 | | | | |
| 4-Oct-04 | 170 | 81.6 | | | | |
| 12-Oct-04 | 230 | 66.9 | 211 | 169.4 | 2.63E+13 | 2.49E+13 |

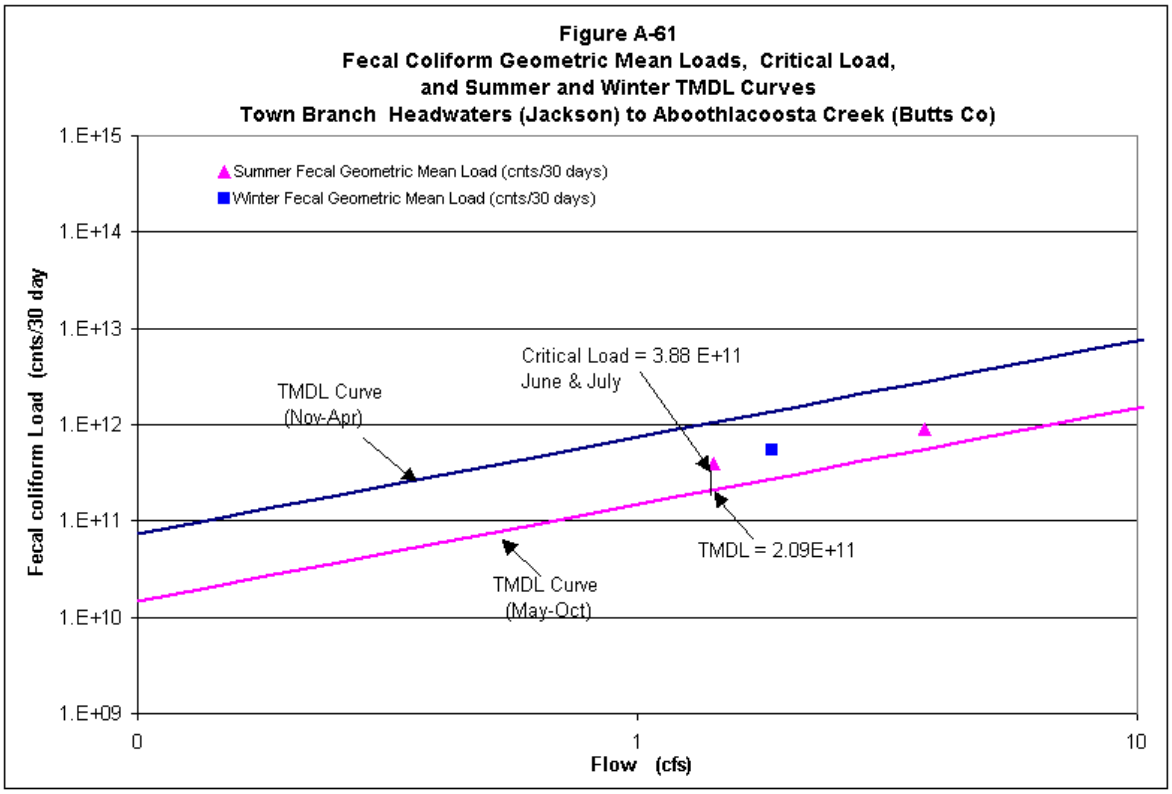



**Table A-61. Data for Figure A-61**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 15-Mar-04 | 550 | 2.3 | | | | |
| 22-Mar-04 | 300 | 1.8 | | | | |
| 29-Mar-04 | 365 | 2.2 | | | | |
| 5-Apr-04 | 400 | 1.2 | 394 | 1.9 | 5.37E+11 | 1.36E+12 |
| 21-Jun-04 | 800 | 0.4 | | | | |
| 28-Jun-04 | 300 | 3.9 | | | | |
| 6-Jul-04 | 300 | 1.1 | | | | |
| 13-Jul-04 | 265 | 0.3 | 372 | 1.4 | 3.88E+11 | 2.09E+11 |
| 14-Sep-04 | 260 | 9.9 | | | | |
| 22-Sep-04 | 300 | 1.8 | | | | |
| 4-Oct-04 | 300 | 1.8 | | | | |
| 12-Oct-04 | 455 | 1.5 | 321 | 3.8 | 8.84E+11 | 5.51E+11 |

**Figure A-62**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Turkey Creek Headwaters to Yellow River (Gwinnett Co)**

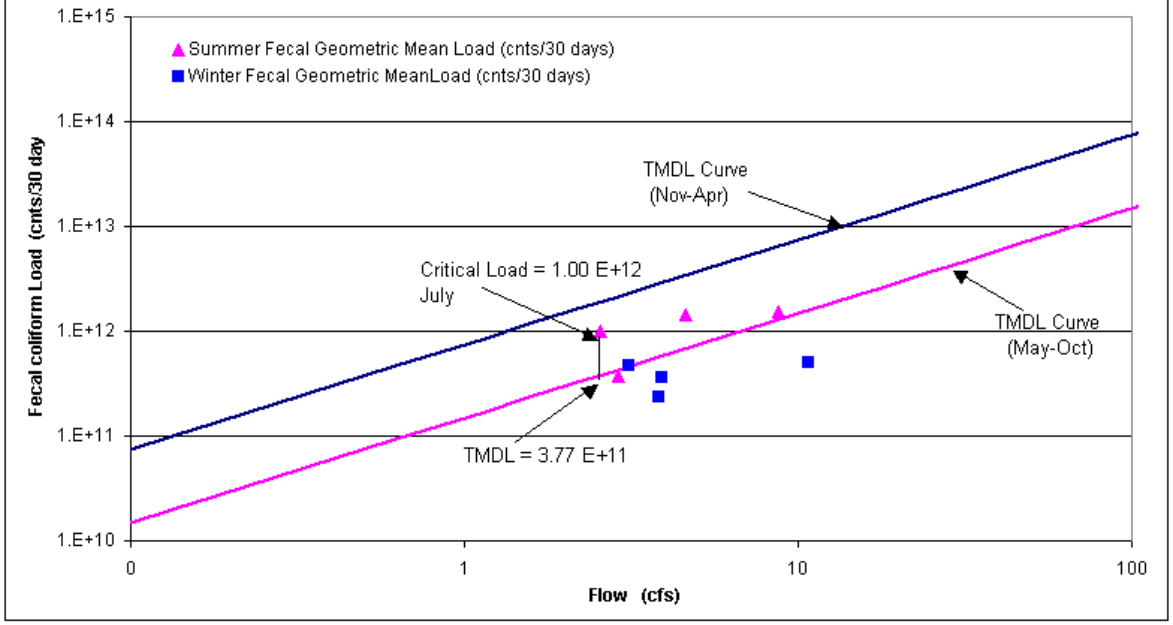



**Table A-62. Data for Figure A-62**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 10-Mar-04 | 2755 | 3.3 | | | | |
| 17-Mar-04 | 133 | 2.9 | | | | |
| 24-Mar-04 | 130 | 2.7 | | | | |
| 31-Mar-04 | 40 | 3.6 | 209 | 3 | 4.76E+11 | 2.28E+12 |
| 10-Jul-04 | 220 | 3.9 | | | | |
| 17-Jul-04 | 900 | 2.1 | | | | |
| 24-Jul-04 | 500 | 1.8 | | | | |
| 31-Jul-04 | 800 | 2.5 | 530 | 3 | 1.00E+12 | 3.77E+11 |
| 9-Sep-04 | 500 | 5.2 | | | | |
| 16-Sep-04 | 170 | 19.1 | | | | |
| 23-Sep-04 | 230 | 4.1 | | | | |
| 30-Sep-04 | 170 | 6.6 | 240 | 9 | 1.54E+12 | 6.42E+12 |
| 10-Jan-05 | 40 | 3.1 | | | | |
| 17-Jan-05 | 700 | 3.9 | | | | |
| 24-Jan-05 | 220 | 3.3 | | | | |
| 31-Jan-05 | 40 | 5.4 | 125 | 4 | 3.61E+11 | 2.88E+12 |
| 9-Apr-05 | 70 | 7.5 | | | | |
| 16-Apr-05 | 40 | 4.1 | | | | |
| 23-Apr-05 | 80 | 12.3 | | | | |
| 30-Apr-05 | 70 | 19.0 | 63 | 11 | 4.95E+11 | 7.87E+12 |
| 9-Jun-05 | 155 | 9.6 | | | | |
| 16-Jun-05 | 1300 | 3.1 | | | | |
| 23-Jun-05 | 500 | 3.2 | | | | |
| 30-Jun-05 | 300 | 2.5 | 417 | 5 | 1.42E+12 | 6.79E+11 |
| 10-Oct-05 | 700 | 4.1 | | | | |
| 17-Oct-05 | 130 | 2.6 | | | | |
| 24-Oct-05 | 80 | 2.5 | | | | |
| 31-Oct-05 | 130 | 2.4 | 175 | 3 | 3.74E+11 | 4.26E+11 |
| 10-Dec-05 | 130 | 3.8 | | | | |
| 17-Dec-05 | 20 | 5.3 | | | | |
| 24-Dec-05 | 60 | 3.1 | | | | |
| 31-Dec-05 | 300 | 3.0 | 83 | 4 | 2.32E+11 | 2.80E+12 |

**Figure A-63**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02216187 Turnpike Creek at Cedar Park Dowdyville Road near Lumber City, Georgia**

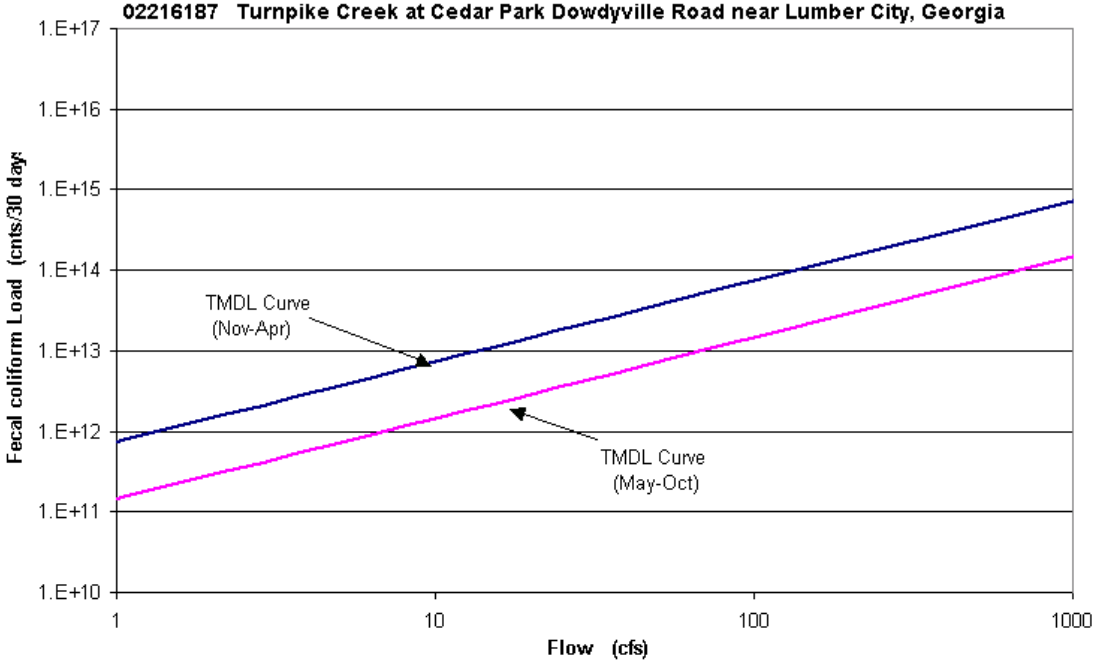



**Table A-63. Data for Figure A-63**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| **1-Apr-99** | **6400** | **15.1** | | | | |
| 8-Apr-99 | 110 | 7.5 | | | | |
| 14-Apr-99 | 490 | 2.6 | | | | |
| 21-Apr-99 | 110 | 1.2 | 441 | 6.6 | 2.13E+12 | 4.83E+12 |
| 17-Feb-04 | 230 | 417.0 | | | | |
| 1-Mar-04 | 70 | 158.0 | | | | |
| 8-Mar-04 | 110 | 48.0 | | | | |
| 15-Mar-04 | 20 | 25.0 | 77 | 162.0 | 9.17E+12 | 1.19E+14 |
| 13-Sep-04 | 230 | 144.4 | | | | |
| 22-Sep-04 | 70 | 43.0 | | | | |
| 29-Sep-04 | 170 | 720.0 | | | | |
| 4-Oct-04 | 230 | 134.0 | 158 | 260.3 | 3.03E+13 | 3.82E+13 |
| 1-Nov-04 | 140 | 17.0 | | | | |
| 8-Nov-04 | 500 | 21.0 | | | | |
| 16-Nov-04 | 230 | 18.0 | | | | |
| 18-Nov-04 | 170 | 13.0 | 229 | 17.3 | 2.90E+12 | 1.27E+13 |

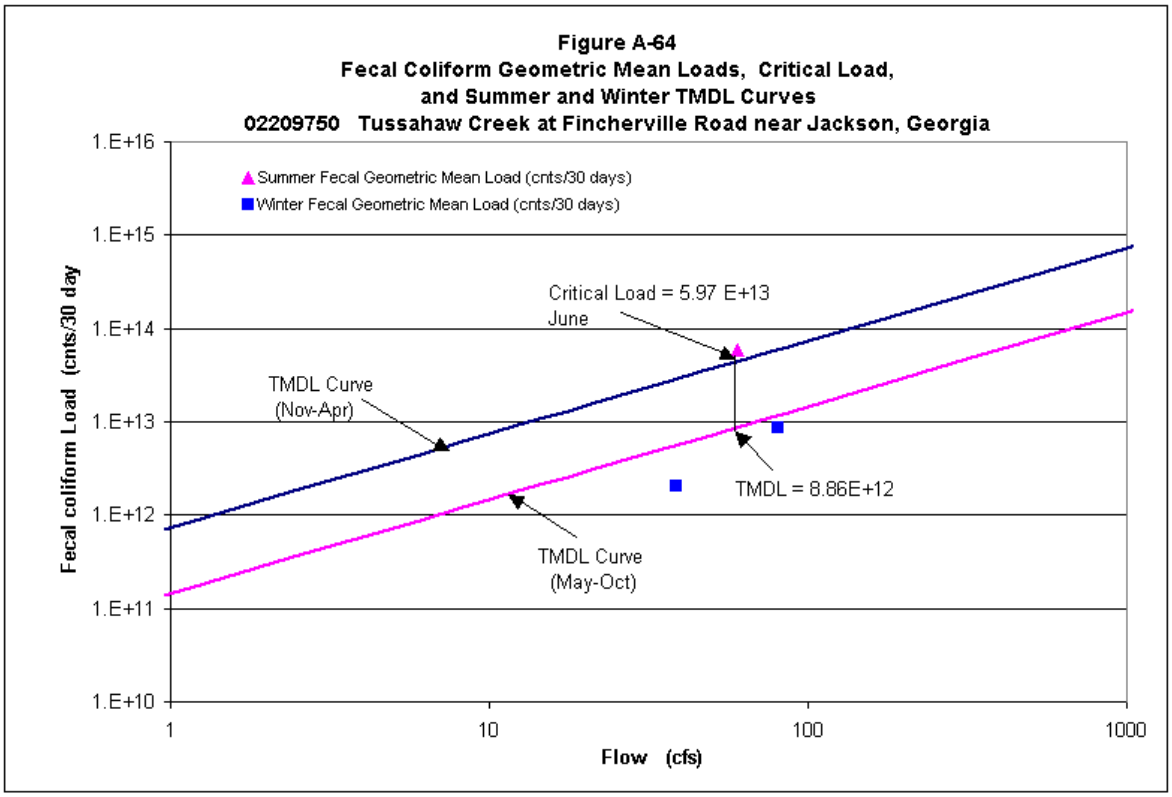



**Table A-64. Data for Figure A-64**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 4-Feb-04 | 80 | 55.0 | | | | |
| 12-Feb-04 | 790 | 140.0 | | | | |
| 19-Feb-04 | 90 | 67.0 | | | | |
| 24-Feb-04 | 80 | 59.0 | 146 | 80.3 | 8.60E+12 | 5.89E+13 |
| 17-Mar-04 | 50 | 44.0 | | | | |
| 25-Mar-04 | 20 | 38.0 | | | | |
| 29-Mar-04 | 500 | 38.0 | | | | |
| 15-Apr-04 | 50 | 35.0 | 71 | 38.8 | 2.01E+12 | 2.84E+13 |
| 16-Jun-04 | 700 | 52.0 | | | | |
| 17-Jun-04 | 5000 | 73.0 | | | | |
| 24-Jun-04 | 700 | 56.0 | 1348 | 60.3 | 5.97E+13 | 8.86E+12 |

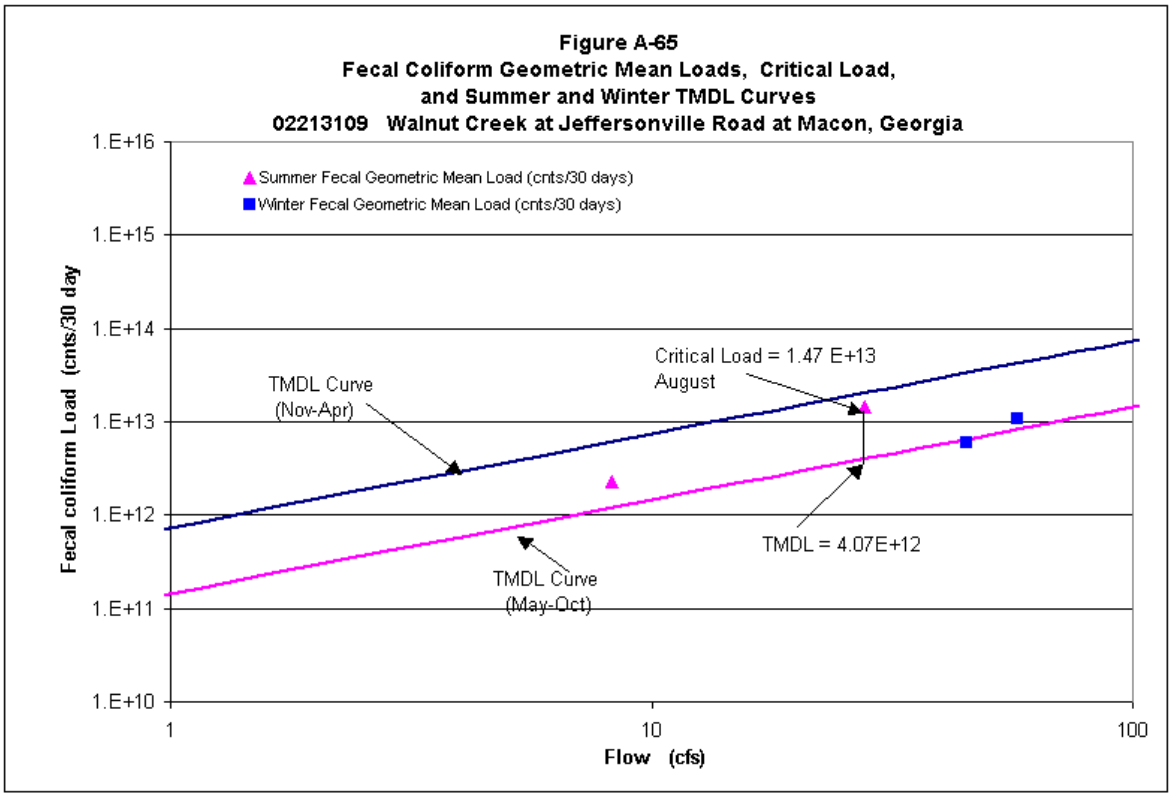



**Table A-65. Data for Figure A-65**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 2-Mar-04 | 110 | 71.0 | | | | |
| 3-Mar-04 | 800 | 64.0 | | | | |
| 18-Mar-04 | 170 | 27.0 | | | | |
| 23-Mar-04 | 70 | 18.0 | 180 | 45.0 | 5.94E+12 | 3.30E+13 |
| 6-May-04 | 300 | 10.0 | | | | |
| 13-May-04 | 300 | 7.0 | | | | |
| 20-May-04 | 800 | 9.0 | | | | |
| 26-May-04 | 300 | 7.0 | 383 | 8.3 | 2.32E+12 | 1.21E+12 |
| 4-Aug-04 | 20 | 7.0 | | | | |
| 12-Aug-04 | 16000 | 82.0 | | | | |
| 19-Aug-04 | 1700 | 13.0 | | | | |
| 23-Aug-04 | 500 | 9.0 | 722 | 27.8 | 1.47E+13 | 4.07E+12 |
| 17-Nov-04 | 140 | 48.0 | | | | |
| 22-Nov-04 | 300 | 48.0 | | | | |
| 1-Dec-04 | 800 | 81.0 | | | | |
| 8-Dec-04 | 130 | 54.0 | 257 | 57.8 | 1.09E+13 | 4.24E+13 |

**Figure A-66**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Watson Creek Headwaters to Yellow River (Gwinnett Co)**

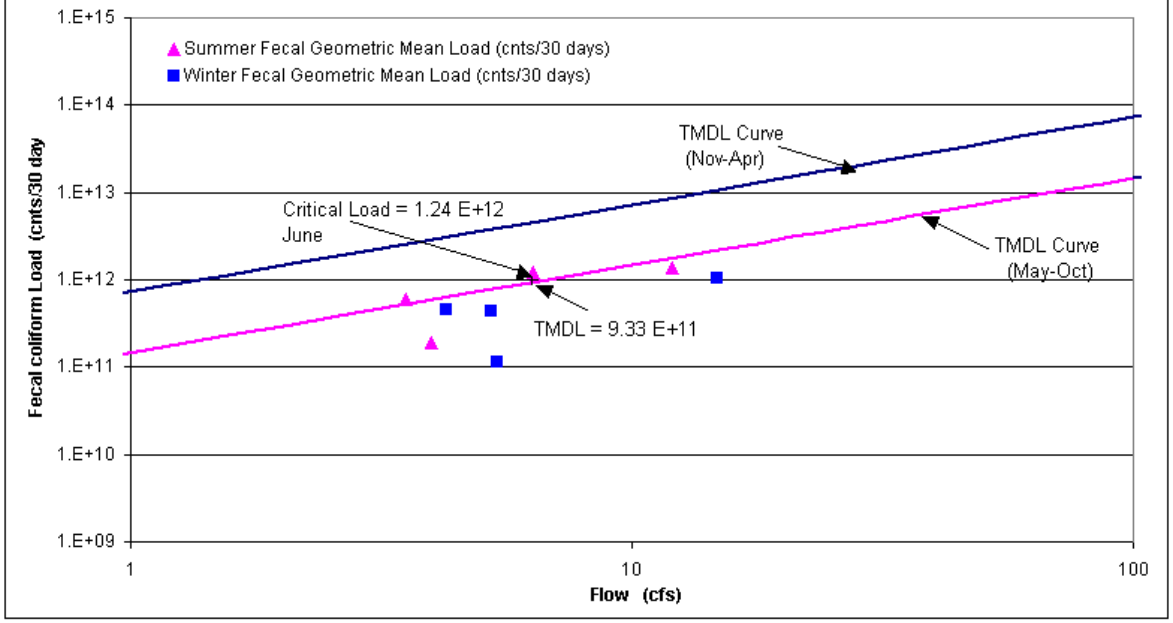



**Table A-66. Data for Figure A-66**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 10-Mar-04 | 3873 | 4.5 | | | | |
| 17-Mar-04 | 73 | 4.0 | | | | |
| 24-Mar-04 | 40 | 3.7 | | | | |
| 31-Mar-04 | 40 | 4.9 | 146 | 4 | 4.57E+11 | 3.13E+12 |
| 10-Jul-04 | 220 | 5.4 | | | | |
| 17-Jul-04 | 230 | 2.9 | | | | |
| 24-Jul-04 | 500 | 2.5 | | | | |
| 31-Jul-04 | 110 | 3.4 | 230 | 4 | 5.96E+11 | 5.19E+11 |
| 9-Sep-04 | 230 | 7.2 | | | | |
| 16-Sep-04 | 130 | 26.3 | | | | |
| 23-Sep-04 | 40 | 5.6 | | | | |
| 30-Sep-04 | 500 | 9.0 | 156 | 12 | 1.38E+12 | 1.77E+12 |
| 10-Jan-05 | 40 | 4.2 | | | | |
| 17-Jan-05 | 20 | 5.3 | | | | |
| 24-Jan-05 | 40 | 4.6 | | | | |
| 31-Jan-05 | 20 | 7.4 | 28 | 5 | 1.12E+11 | 3.96E+12 |
| 9-Apr-05 | 70 | 10.4 | | | | |
| 16-Apr-05 | 230 | 5.6 | | | | |
| 23-Apr-05 | 130 | 16.9 | | | | |
| 30-Apr-05 | 40 | 26.1 | 96 | 15 | 1.04E+12 | 1.08E+13 |
| 9-Jun-05 | 110 | 13.3 | | | | |
| 16-Jun-05 | 300 | 4.3 | | | | |
| 23-Jun-05 | 500 | 4.4 | | | | |
| 30-Jun-05 | 300 | 3.5 | 265 | 6 | 1.24E+12 | 9.33E+11 |
| 10-Oct-05 | 170 | 5.7 | | | | |
| 17-Oct-05 | 130 | 3.6 | | | | |
| 24-Oct-05 | 20 | 3.5 | | | | |
| 31-Oct-05 | 40 | 3.3 | 65 | 4 | 1.90E+11 | 5.86E+11 |
| 10-Dec-05 | 130 | 5.2 | | | | |
| 17-Dec-05 | 20 | 7.3 | | | | |
| 24-Dec-05 | 80 | 4.3 | | | | |
| 31-Dec-05 | 800 | 4.2 | 114 | 5 | 4.37E+11 | 3.85E+12 |

**Figure A-67**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Wise Creek at Concord Road (County Road 141) near Monticello, Georgia**

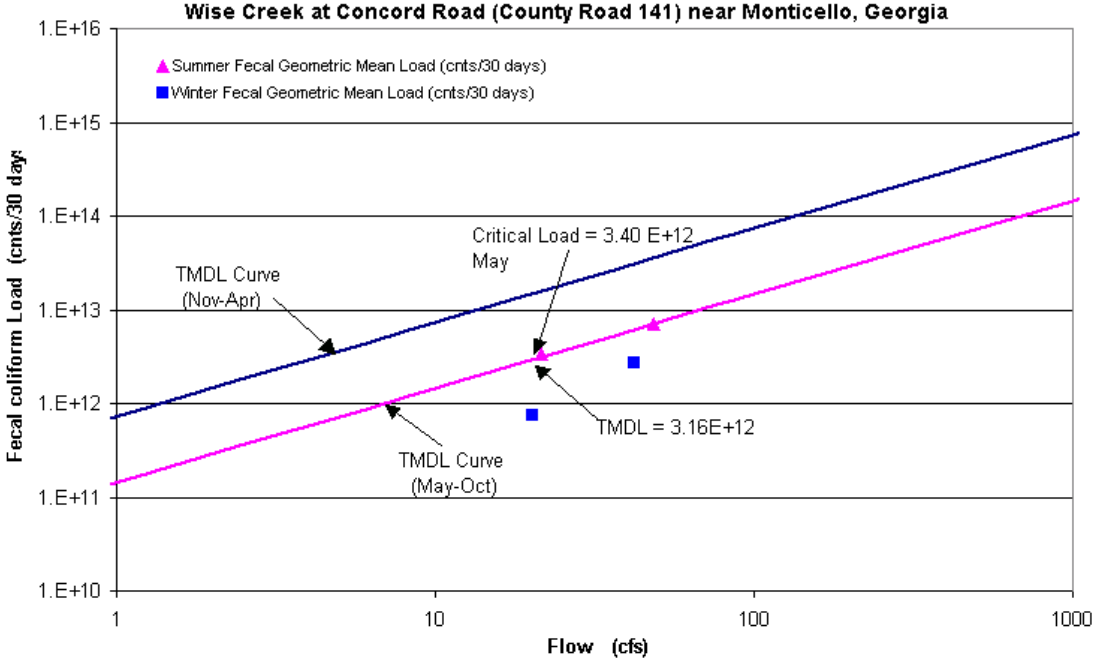



**Table A-67. Data for Figure A-67**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 2-Mar-04 | 70 | 22.7 | | | | |
| 3-Mar-04 | 60 | 22.0 | | | | |
| 18-Mar-04 | 40 | 18.5 | | | | |
| 23-Mar-04 | 40 | 18.0 | 51 | 20.3 | 7.58E+11 | 1.49E+13 |
| 6-May-04 | 110 | 16.2 | | | | |
| 13-May-04 | 300 | 40.6 | | | | |
| 19-May-04 | 130 | 16.4 | | | | |
| 27-May-04 | 500 | 12.9 | 215 | 21.6 | 3.40E+12 | 3.16E+12 |
| 4-Aug-04 | 230 | 18.3 | | | | |
| 12-Aug-04 | 230 | 149.0 | | | | |
| 18-Aug-04 | 220 | 13.4 | | | | |
| 23-Aug-04 | 130 | 13.3 | 197 | 48.5 | 7.01E+12 | 7.11E+12 |
| 18-Nov-04 | 170 | 18.6 | | | | |
| 22-Nov-04 | 130 | 80.1 | | | | |
| 2-Dec-04 | 20 | 30.2 | | | | |
| 8-Dec-04 | 140 | 39.0 | 89 | 42.0 | 2.73E+12 | 3.08E+13 |

**Figure A-68**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02210998 Wise Creek at Concord Road (County Road 141) near Monticello**

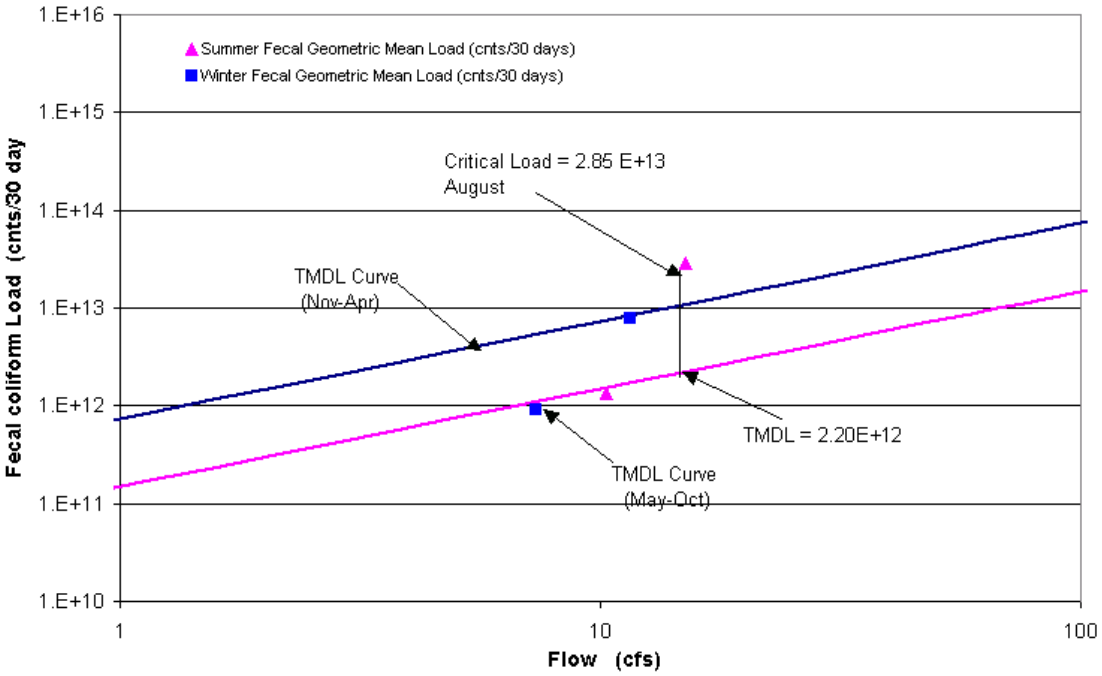



**Table A-68. Data for Figure A-68**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 13-Jan-04 | 230 | 5.8 | | | | |
| 20-Jan-04 | 20 | 5.9 | | | | |
| 28-Jan-04 | 130 | 9.7 | | | | |
| 2-Feb-04 | 1300 | 8.0 | 167 | 7.4 | 9.02E+11 | 5.40E+12 |
| 13-Apr-04 | 3000 | 30.4 | | | | |
| 19-Apr-04 | 800 | 5.3 | | | | |
| 21-Apr-04 | 2400 | 5.0 | | | | |
| 28-Apr-04 | 130 | 5.3 | 930 | 11.5 | 7.86E+12 | 8.45E+12 |
| 20-Jul-04 | 330 | 4.4 | | | | |
| 26-Jul-04 | 9000 | 35.5 | | | | |
| 28-Jul-04 | 3000 | 14.0 | | | | |
| 3-Aug-04 | 5000 | 6.1 | 2584 | 15.0 | 2.85E+13 | 2.20E+12 |
| 18-Oct-04 | 70 | 4.6 | | | | |
| 20-Oct-04 | 800 | 26.7 | | | | |
| 25-Oct-04 | 230 | 5.3 | | | | |
| 27-Oct-04 | 80 | 4.8 | 179 | 10.3 | 1.36E+12 | 1.52E+12 |

**Figure A-69**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02210998 Wise Creek at Concord Road (County Road 141) near Monticello**

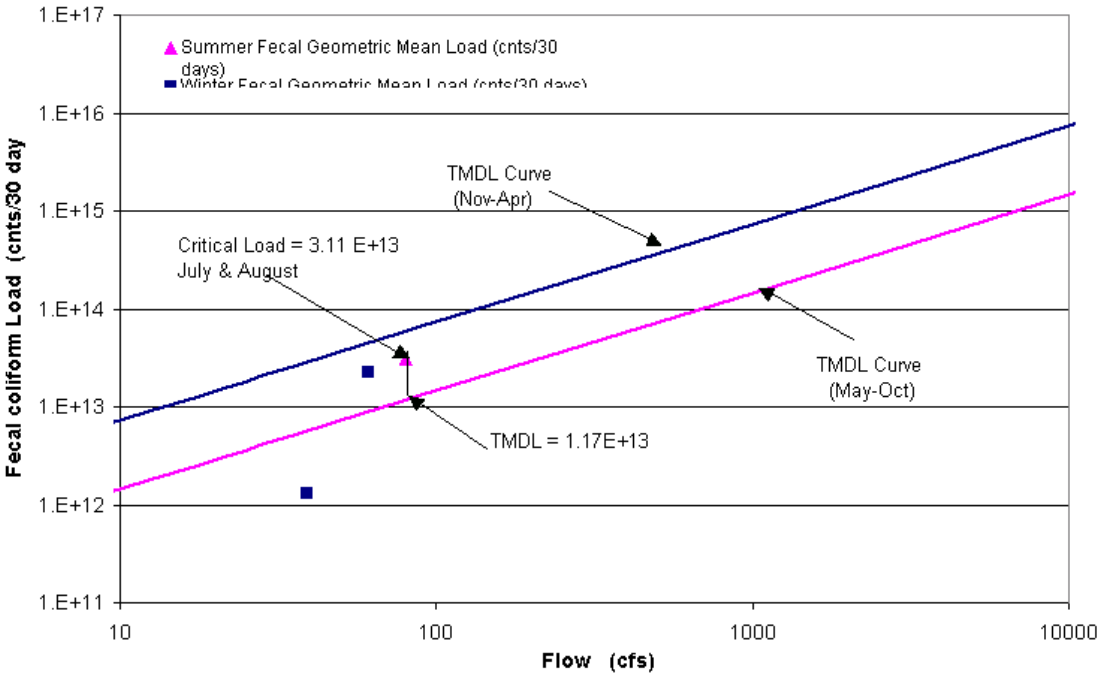



**Table A-69. Data for Figure A-69**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 13-Jan-04 | 20 | 30.7 | | | | |
| 20-Jan-04 | 140 | 31.3 | | | | |
| 28-Jan-04 | 80 | 51.6 | | | | |
| 2-Feb-04 | 20 | 42.7 | 46 | 39.1 | 1.32E+12 | 2.87E+13 |
| 13-Apr-04 | 9000 | 161.5 | | | | |
| 19-Apr-04 | 80 | 28.3 | | | | |
| 21-Apr-04 | 170 | 26.5 | | | | |
| 28-Apr-04 | 500 | 28.1 | 497 | 61.1 | 2.23E+13 | 4.49E+13 |
| 20-Jul-04 | 220 | 23.2 | | | | |
| 26-Jul-04 | 2400 | 188.7 | | | | |
| 28-Jul-04 | 500 | 74.5 | | | | |
| 3-Aug-04 | 300 | 32.6 | 530 | 79.7 | 3.11E+13 | 1.17E+13 |

**Figure A-70**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Yellow River Sweetwater Creek to Highway 124 (Gwinnett Co)**

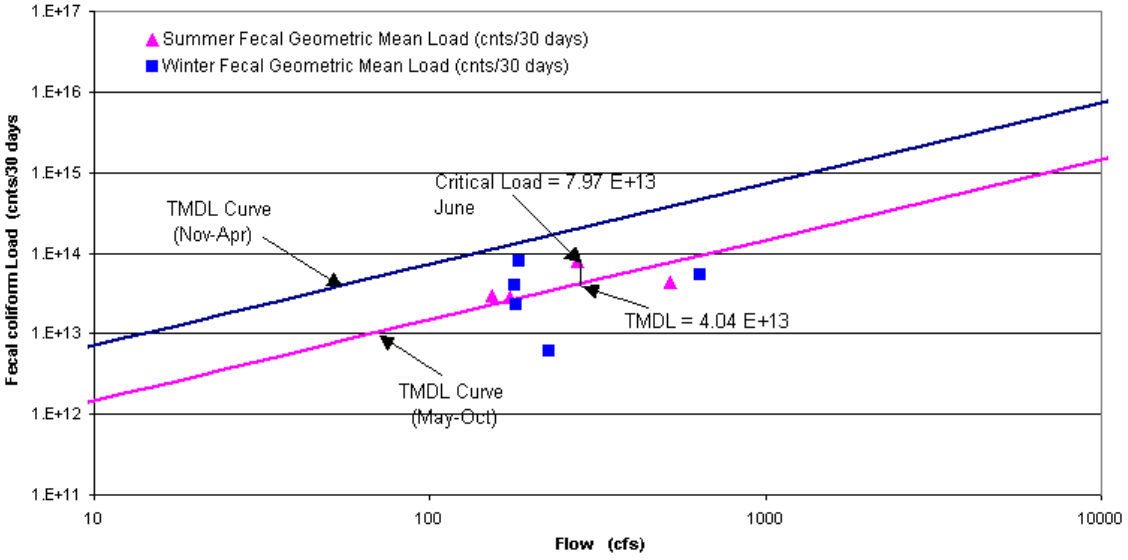



**Table A-70. Data for Figure A-70**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 17-Jan-04 | 500 | 158.7 | | | | |
| 24-Jan-04 | 40 | 152.7 | | | | |
| 31-Jan-04 | 130 | 201.9 | 300 | 179 | 3.94E+13 | 1.31E+14 |
| 10-Mar-04 | 2382 | 194.1 | | | | |
| 17-Mar-04 | 140 | 174.3 | | | | |
| 24-Mar-04 | 500 | 158.7 | | | | |
| 31-Mar-04 | 700 | 211.3 | 584 | 185 | 7.92E+13 | 1.35E+14 |
| 10-Jul-04 | 130 | 232.0 | | | | |
| 17-Jul-04 | 500 | 125.9 | | | | |
| 24-Jul-04 | 300 | 107.0 | | | | |
| 31-Jul-04 | 230 | 146.6 | 259 | 153 | 2.90E+13 | 2.24E+13 |
| 9-Sep-04 | 300 | 311.4 | | | | |
| 16-Sep-04 | 130 | 1138.7 | | | | |
| 23-Sep-04 | 230 | 241.5 | | | | |
| 30-Sep-04 | 20 | 389.9 | 116 | 520 | 4.42E+13 | 7.64E+13 |
| 9-Apr-05 | 130 | 448.6 | | | | |
| 16-Apr-05 | 110 | 243.3 | | | | |
| 23-Apr-05 | 80 | 729.8 | | | | |
| 30-Apr-05 | 140 | 1130.1 | 112 | 638 | 5.27E+13 | 4.68E+14 |
| 9-Jun-05 | 230 | 573.7 | | | | |
| 16-Jun-05 | 2400 | 186.3 | | | | |
| 23-Jun-05 | 40 | 189.8 | | | | |
| 30-Jun-05 | 1100 | 150.1 | 395 | 275 | 7.97E+13 | 4.04E+13 |
| 10-Oct-05 | 500 | 245.9 | | | | |
| 17-Oct-05 | 230 | 153.5 | | | | |
| 24-Oct-05 | 170 | 149.2 | | | | |
| 31-Oct-05 | 130 | 142.3 | 225 | 173 | 2.85E+13 | 2.54E+13 |
| 10-Dec-05 | 110 | 225.1 | | | | |
| 17-Dec-05 | 40 | 317.5 | | | | |
| 24-Dec-05 | 20 | 184.6 | | | | |
| 31-Dec-05 | 20 | 180.3 | 36 | 227 | 6.07E+12 | 1.67E+14 |
| 10-Mar-06 | 110 | 180.3 | | | | |
| 17-Mar-06 | 80 | 180.3 | | | | |
| 24-Mar-06 | 130 | 180.3 | | | | |
| 31-Mar-06 | 800 | 180.3 | 174 | 180 | 2.30E+13 | 1.32E+14 |

**Figure A-71**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**Yellow River Centerville Creek to Hammock Creek (Gwinnett/DeKalb Co)**

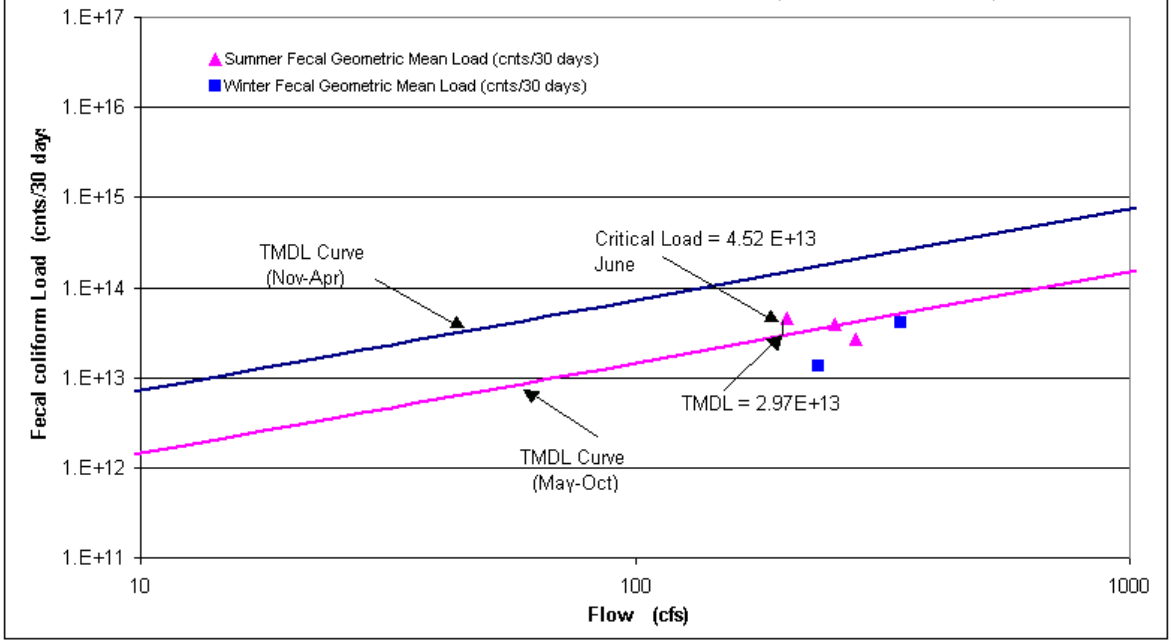



**Table A-71. Data for Figure A-71**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 4-May-04 | 800 | 218.4 | | | | |
| 11-May-04 | 140 | 190.1 | | | | |
| 18-May-04 | 210 | 246.8 | | | | |
| 25-May-04 | 367 | 153.3 | 305 | 202.1 | 4.52E+13 | 2.97E+13 |
| 5-Oct-04 | 107 | 282.5 | | | | |
| 12-Oct-04 | 127 | 183.8 | | | | |
| 19-Oct-04 | 147 | 484.1 | | | | |
| 26-Oct-04 | 153 | 171.2 | 132 | 280.4 | 2.72E+13 | 4.12E+13 |
| 4-Jan-05 | 13 | 234.2 | | | | |
| 11-Jan-05 | 107 | 218.4 | | | | |
| 18-Jan-05 | 190 | 257.3 | | | | |
| 25-Jan-05 | 135 | 231.0 | 77 | 235.2 | 1.33E+13 | 1.73E+14 |
| 5-Apr-05 | 186 | 445.2 | | | | |
| 12-Apr-05 | 180 | 348.6 | | | | |
| 19-Apr-05 | 133 | 274.1 | | | | |
| 28-Apr-05 | 160 | 305.6 | 163 | 343.4 | 4.12E+13 | 2.52E+14 |
| 10-May-05 | 105 | 216.3 | | | | |
| 17-May-05 | 250 | 240.5 | | | | |
| 24-May-05 | 145 | 200.6 | | | | |
| 31-May-05 | 507 | 357.0 | 210 | 253.6 | 3.90E+13 | 3.72E+13 |

**Figure A-72**
**Fecal Coliform Geometric Mean Loads, Critical Load, and Summer and Winter TMDL Curves**
**02207300 Yellow River - Conyers Water Intake**

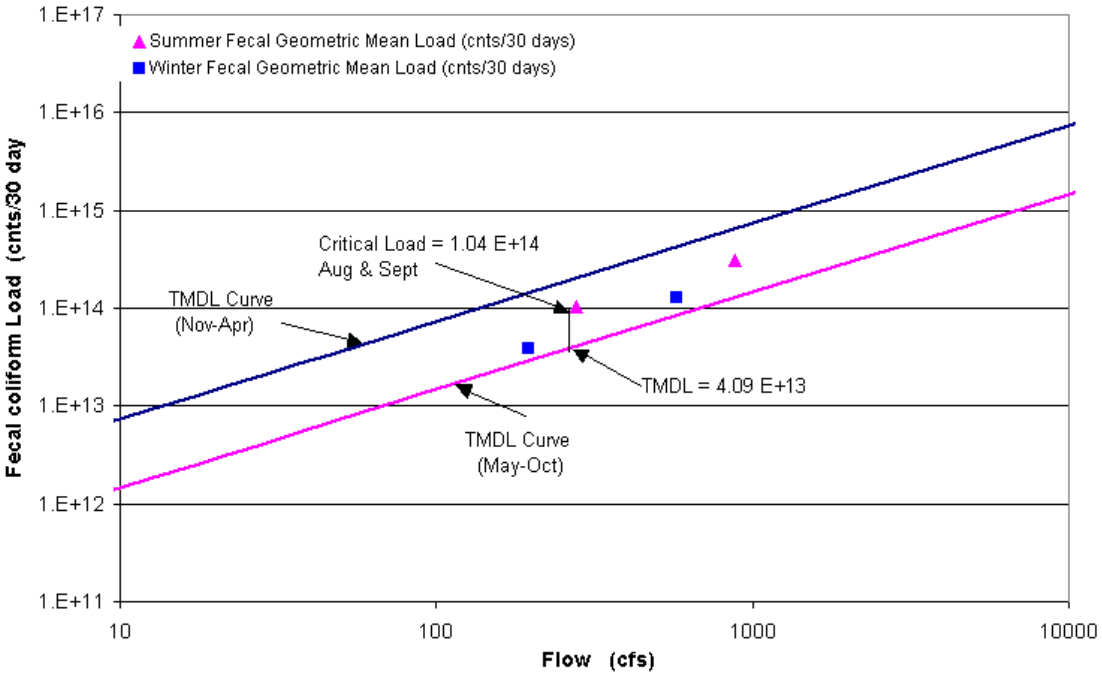



**Table A-72. Data for Figure A-72**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 18-Feb-03 | 500 | 227.5 | | | | |
| 25-Feb-03 | 230 | 209.1 | | | | |
| 4-Mar-03 | 270 | 155.3 | | | | |
| 11-Mar-03 | 170 | 191.4 | 270 | 195.8 | 3.87E+13 | 1.44E+14 |
| 22-May-03 | 1700 | 2782.9 | | | | |
| 29-May-03 | 110 | 195.1 | | | | |
| 4-Jun-03 | 1700 | 331.3 | | | | |
| 12-Jun-03 | 170 | 209.1 | 482 | 879.6 | 3.11E+14 | 1.29E+14 |
| 20-Aug-03 | 16000 | 583.8 | | | | |
| 27-Aug-03 | 220 | 145.8 | | | | |
| 4-Sep-03 | 110 | 231.9 | | | | |
| 9-Sep-03 | 170 | 152.4 | 507 | 278.5 | 1.04E+14 | 4.09E+13 |
| 5-Nov-03 | 300 | 180.4 | | | | |
| 19-Nov-03 | 2800 | 1840.5 | | | | |
| 1-Dec-03 | 80 | 150.9 | | | | |
| 3-Dec-03 | 130 | 136.2 | 306 | 577.0 | 1.29E+14 | 4.24E+14 |

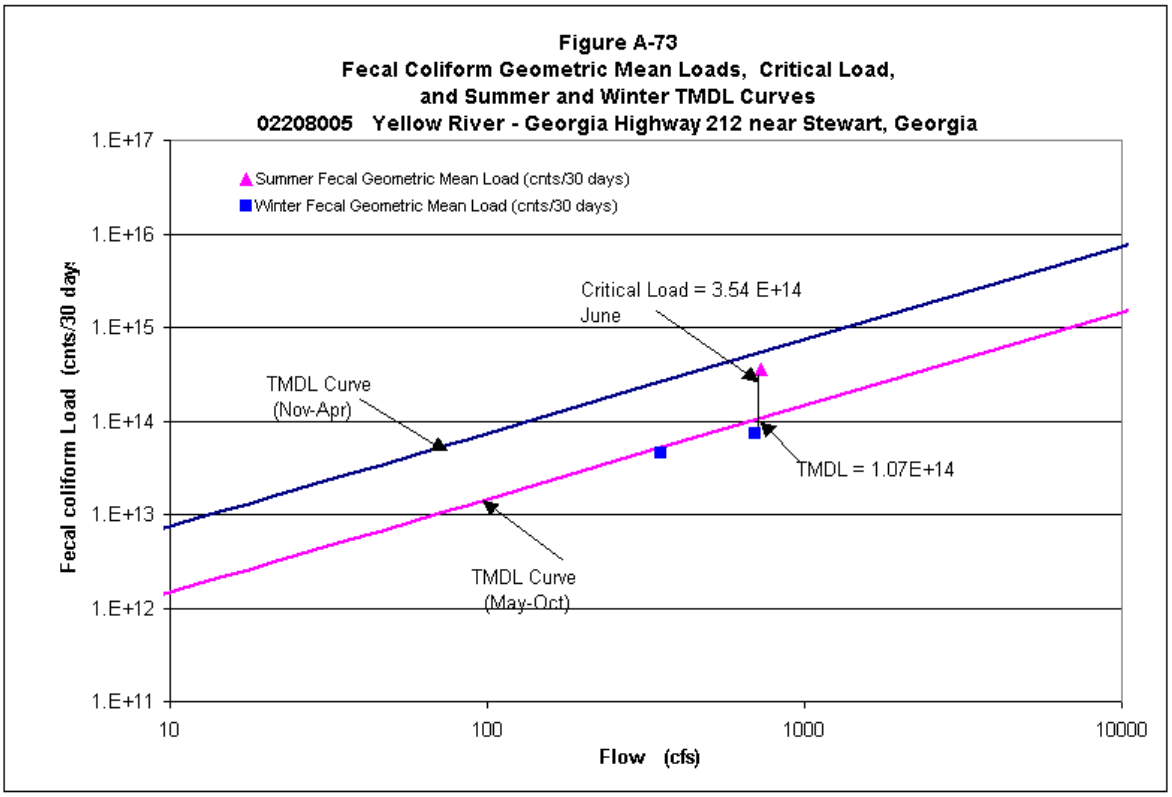
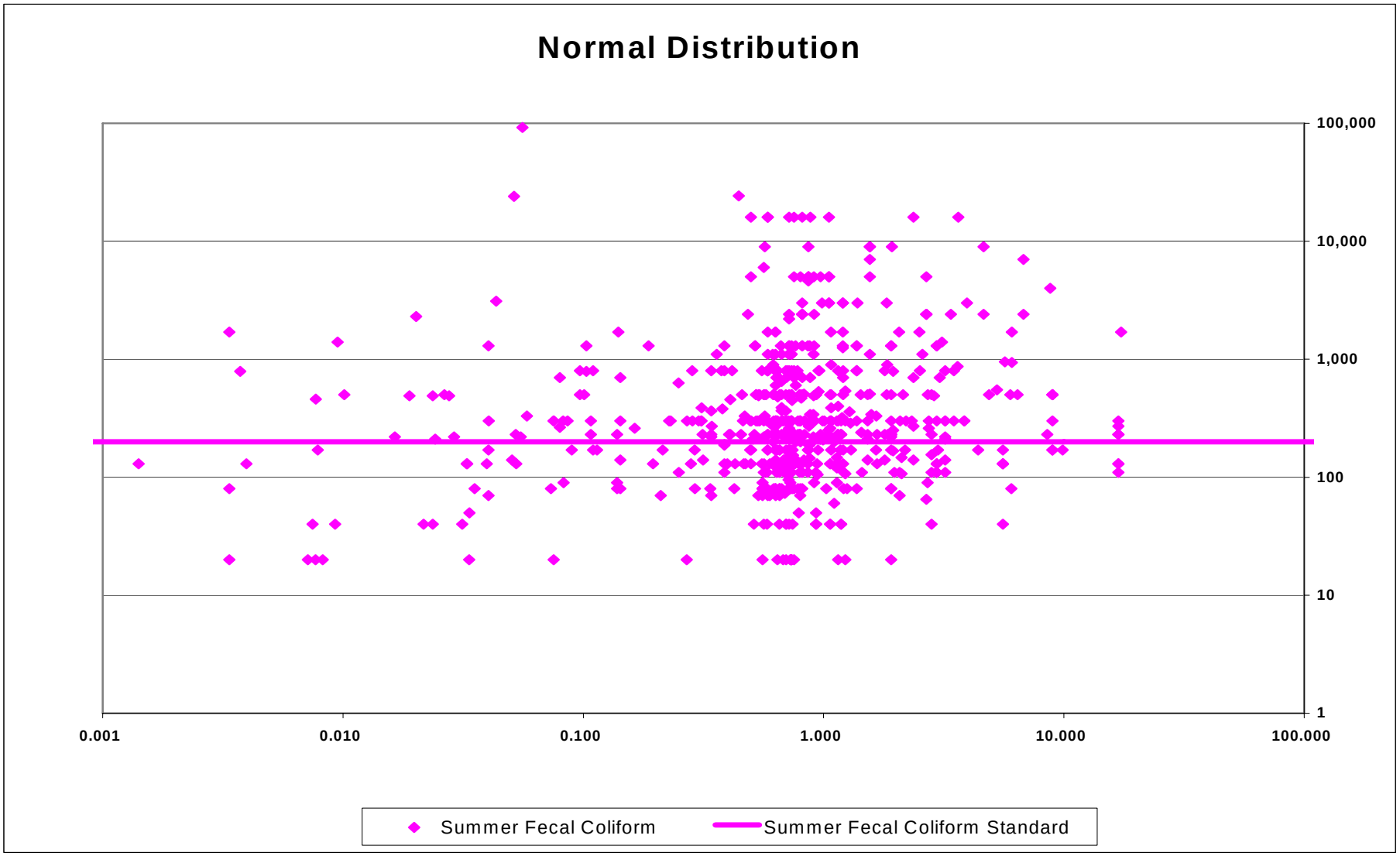


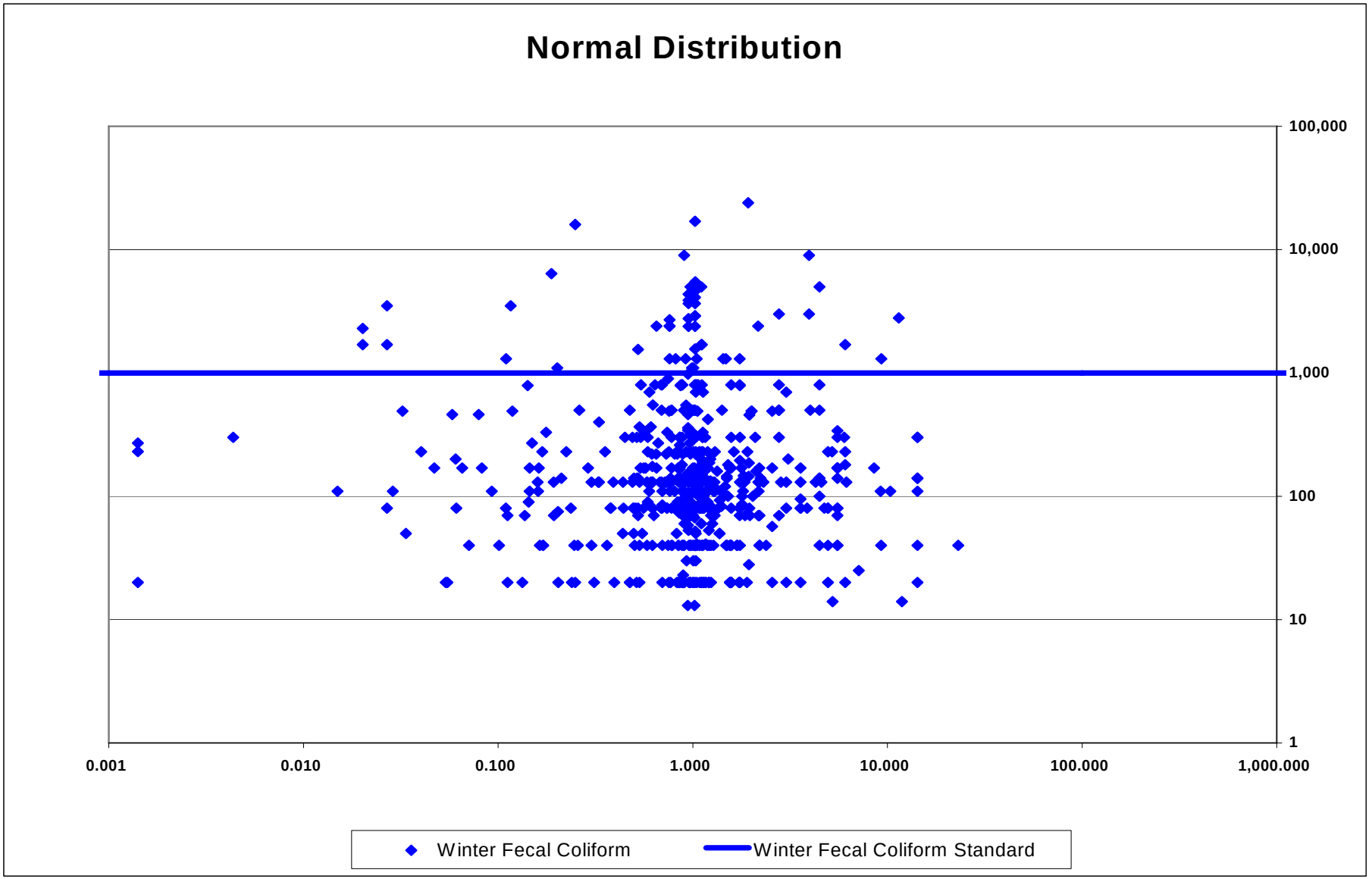

**Table A-73. Data for Figure A-73**

| Date | Observed Fecal Coliform (counts/100 ml) | Estimated Instantaneous Flow On Sample Day (cfs) | Geometric Mean (counts/100 ml) | Mean Flow (cfs) | Geometric Mean Fecal Coliform Loading (counts/30 days) | Geometric Mean TMDL Fecal Coliform Loading (counts/30 days) |
|---|---|---|---|---|---|---|
| 4-Feb-04 | 500 | 890.0 | | | | |
| 12-Feb-04 | 130 | 913.0 | | | | |
| 19-Feb-04 | 80 | 628.0 | | | | |
| 24-Feb-04 | 80 | 362.0 | 143 | 698.3 | 7.32E+13 | 5.13E+14 |
| 17-Mar-04 | 140 | 311.0 | | | | |
| 25-Mar-04 | 130 | 326.0 | | | | |
| 30-Mar-04 | 40 | 315.0 | | | | |
| 15-Apr-04 | 1300 | 461.0 | 175 | 353.3 | 4.55E+13 | 2.59E+14 |
| 15-Jun-04 | 230 | 596.0 | | | | |
| 17-Jun-04 | 1400 | 1000.0 | | | | |
| 24-Jun-04 | 900 | 591.0 | 662 | 729.0 | 3.54E+14 | 1.07E+14 |

# Appendix B

## Normalized Flows Versus Fecal Coliform Plots


Normal Distribution
100,000
10,000
1,000
100
10
1
0.001
0.010
0.100
1.000
10.000
100.000
Summer Fecal Coliform
Summer Fecal Coliform Standard


Normal Distribution
100,000
10,000
1,000
100
10
1
0.001
0.010
0.100
1.000
10.000
100.000
1,000.000
Winter Fecal Coliform
Winter Fecal Coliform Standard