

**Revised TMDL Implementation Plan  
HUC 0307010111 - Town Creek and Beaverdam Creek  
April, 2003**

HUC 0307010111 is located entirely in Greene County, Georgia. The stream drainage includes small portions of the cities of Union Point and Woodville and the entire area of Greensboro..

The stream segments of concern in this TMDL implementation plan include Beaverdam Creek from Oliver Creek and Lake Oconee and Town Creek from SR 15 to Richland Creek. Both segments are listed on the Georgia 303(d) list as not supporting their designated uses due to excessive fecal coliform. Richland Creek, also on the Georgia 303(e) list as not supporting its designated use, is also within the drainage. Richland Creek had a TMDL and associated implementation plan prepared in 1998 and 2001, respectively. The pollutant of concern in all cases is fecal coliform. The watershed drains to Lake Oconee, an impoundment of the Georgia Power Company. Although constructed for the purpose of generating hydropower, Lake Oconee is a major recreation destination for many people from within and outside Georgia. Swimming, boating, and fishing are popular recreational activities.

The streams were listed on the Georgia 303(d) list of impaired water bodies after sampling events in 1999. A Total Maximum Daily Load was established by EPA for the entire Oconee River basin in February, 2002. It recommends a reduction in the fecal coliform loading on Town Creek of 97%, on Beaverdam Creek of 84%, and on Richland Creek of 88%. The watershed is one of the most heavily impacted for fecal coliform in the Northeast Georgia region.

Land use in the watershed is composed mostly of agriculture with significant residential development. The entire City of Greensboro is within the watershed and of course includes industrial, commercial, and residential land uses. Greensboro has an extensive sewerage system that extends into the unincorporated county as well. However, not all areas in the city are served by sewer; extensive areas remain on septic systems. A wastewater treatment plant is located on Richland Creek.

Input from stakeholders indicated the following information about the watershed:

- Several of cattle operations in the watershed have animals fenced out of the streams. This is part of the EQIP program and the development of Nutrient Management Plans (NMP). The NRCS has been implementing a Section 319 grant in the amount of \$450,000 designed to reduce agricultural pollution of Richland and Beaverdam creeks. The program has been under way since 2000, and participation has been good. Other agricultural outreach programs are active in the area as well, including EQIP, implementation of nutrient management plans, and other activities.

- The Greene County and Greensboro land development regulations provide for the minimum 25-foot natural riparian buffer adjacent to perennial streams, but otherwise do not contain any storm water quality requirements.
- It is not known how many illicit connections to storm drains, failed septic tanks, or cases of outright lack of treatment there may be in the basin. The City of Greensboro is over 150 years old, and much of the old development in the city has been preserved. Therefore many of the homes and businesses pre-dated modern health and development laws. There are known, observed illicit connections within the city and in the unincorporated county. Illicit connections have not been systematically searched for.
- The City of Greensboro has recently started a program of active leak detection whereby sewer lines are systematically explored for leaks.

## **Implementation**

The plan identifies the following steps for load reduction:

- Continued implementation of recent and proposed ordinance adoptions and revisions.
- Detailed targeted sampling of the streams to localize the sources of pollutant, beginning with a general survey and following on with more and more localized and detailed sampling until specific sources can be identified.
- Implementation of BMP's specific to the identified sources, including septic tank education and maintenance, sewer leak detection, extension of sewer lines as feasible to take out poorly-functioning septic tanks, and Nutrient Management Plan implementation on agricultural operations.
- Ongoing educational efforts will proceed under the auspices of Greene County, the NRCS, Agricultural Extension, and the City of Greensboro. These will include identifying and contacting failed septic tank owners and educating them about the need for maintenance of septic tanks; continued promotion of agricultural BMP's.
- The effectiveness of the implementation plan should be evaluated after five years by incorporating the implementation activities that have taken place, updated land use information, and additional monitoring data into the BASINS model with which the TMDL was prepared.

## Local Government Activities in the Lower Oconee Watershed

*Codes:* **E** = active/enforced    **P** = planned    **C** = considered    **R** = rejected

	Greene Co.	Greensboro
<i>Ordinance/Regs</i>		
Stormwater Ordinance	<b>C</b>	
Local Soil E & S Control	<b>E</b>	<b>E</b>
Illicit Discharge Ordinance		
Stream Buffer Ordinance	<b>E</b>	<b>E</b>
Impervious Surface Limits		
Septic Tank Maintenance	<b>E</b>	<b>E</b>
Wetland Protection Ordinance	<b>E</b>	
Active Sewer Leak Detection	<b>E</b>	<b>E</b>
Watershed Assessment Study		<b>E</b>
SWAP Study	<b>E</b>	<b>E</b>
Wildlife Habitat Incentive Program	<b>E</b>	
Greenspace Program		
Watershed Protection Plan	<b>E</b>	
River Corridor Protection	<b>E</b>	
Pollution Source Identification	<b>P</b>	<b>P</b>
Clean & Beautiful	<b>P</b>	
Nutrient Man. Program/Equip, etc.	<b>E</b>	
Stormwater Utility		

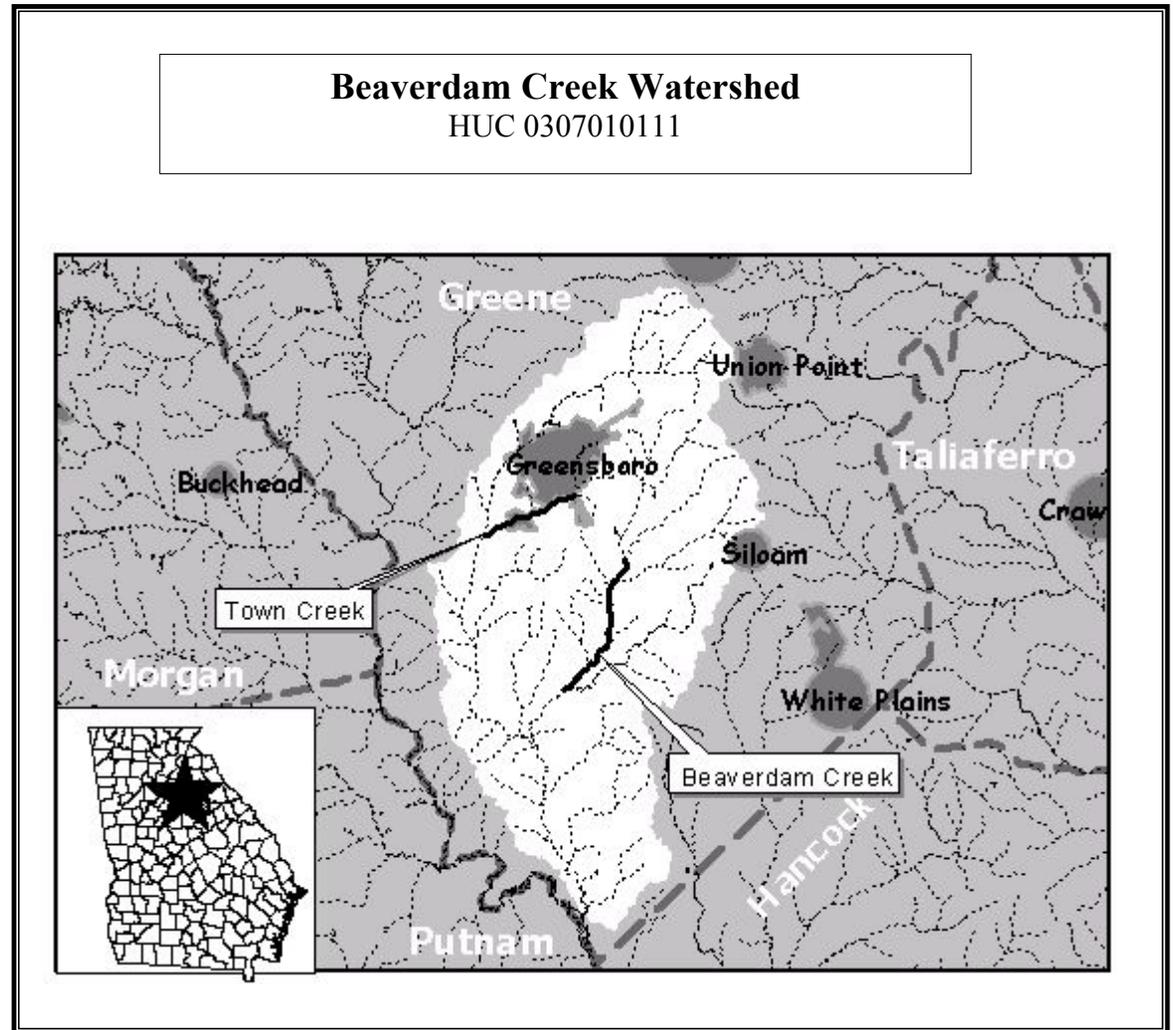
**STATE OF GEORGIA  
REVISED TMDL  
IMPLEMENTATION PLAN  
WATERSHED APPROACH**

Local Watershed Governments

Northeast Georgia RDC  
Greene County  
City of Greensboro  
City of Siloam  
City of Union Point

TMDL Implementation Plans are platforms for establishing a course of actions to restore the quality of impaired water bodies in a watershed. They are intended as a continuing process that may be revised as new conditions and information warrant. Procedures will be developed to track and evaluate the implementation of the management practices and activities identified in the plans. Once restored, appropriate management practices and activities will be continued to maintain the water bodies. **With input from appropriate stakeholder groups, a TMDL Implementation Plan has been developed for a cluster of impaired streams and the corresponding pollutants.** The impaired streams are located in the same sub-basin identified by a HUC10 code (Figure 1).

This Implementation Plan addresses an action plan, education/outreach activities, stakeholders, pollutant sources, and potential funding sources affecting the sub-basin. In addition, the Plan describes (a) regulatory and voluntary practices/control actions (*management measures*) to reduce target pollutants, (b) milestone schedules to show the development of the management measures (*measurable milestones*), (c) a monitoring plan to determine the efficiency of the management measures and measurable milestones, and (d) criteria to determine whether substantial progress is being made towards reducing pollutants in impaired waterbodies. The overall goal of the Plan is to define a set of actions that will help achieve water quality standards in the state of Georgia. Following this section is information regarding individual segments.



**FIGURE 1**

Impaired Waterbody*	Impaired Stream Location	Impairment
1. Beaverdam Creek	Oliver Creek to Lake Oconee, S. of Greensboro	Fecal Coliform
2. Town Creek	Hwy. 15 to Richland Creek, Greensboro	Fecal Coliform

\*These Waterbody Numbers are referenced throughout the Implementation Plan.

# Action Plan for Beaverdam Creek Watershed

Beaverdam Creek Watershed  
HUC 0307010111

POLLUTANT:	SOURCE:	EFFECT:	WHAT CAN I DO?	
			At Home: Community, School	At Work: Business, Government
<input type="checkbox"/> Dissolved Oxygen (DO)	<input type="checkbox"/> Industrial	<input type="checkbox"/> Habitat		
<input checked="" type="checkbox"/> Fecal Coliform (FC)	<input checked="" type="checkbox"/> Urban	<input checked="" type="checkbox"/> Recreation		
<input type="checkbox"/> Sediment	<input checked="" type="checkbox"/> Agriculture	<input type="checkbox"/> Drinking Water		
<input type="checkbox"/> Metals	<input type="checkbox"/> Forestry	<input type="checkbox"/> Aesthetics		
<input type="checkbox"/> Fish Consumption Guidelines (FCG)	<input checked="" type="checkbox"/> Residential	<input type="checkbox"/> Other (Please List)		
<input type="checkbox"/> Other (Please List)	<input type="checkbox"/> Other (Please List)			

## INFORMATION/EDUCATION/OUTREACH ACTIVITIES

An education/outreach component will be used to enhance public understanding of and participation in implementing the TMDL Implementation Plan. List of all previous and planned information/education/outreach activities.

Responsible Organization Or Entity	Description	Impacted Waterbodies*	Target Audience	Anticipated Dates (MM/YY)
NRCS	Ongoing educational programs on minimizing stream impacts of cattle, strategies for high-impact areas, nutrient management plans, and other BMP's for reducing fecal pollution.	1,2	Cattle and poultry farmers, dairy farms.	Ongoing
Cooperative Extension Service	Ongoing educational programs on minimizing stream impacts of cattle, strategies for high-impact areas, nutrient management plans, and other BMP's for reducing fecal pollution.	1,2	Cattle and poultry farmers, dairy farms.	Ongoing
Greene County, City of Greensboro, Greene County Health Department	Advisement to property owners of potential problems with septic tanks, requirements for septic tank maintenance, notification of identified septic tank problems when they are discovered.	1,2	Urban and rural residences.	09/03 and ongoing.



**WATER BODIES/STREAMS COVERED IN THIS PLAN:**

These impaired streams are located in the same sub-basin identified by a HUC10 code. Most of the information contained in this section comes from the 303(d) list and has been completed by employees of the EPD Water Protection Branch. Data that placed stream on 303(d) list will be provided upon request.

Waterbody Name #1	Location	Miles/Area Impacted	Use Classification	Partially Supporting/ Not Supporting (PS/NS)
<b>Beaverdam Creek</b>	Oliver Creek to Lake Oconee, S. of Greensboro	4	Fishing	Not Supporting
<b>Primary County</b>	<b>Secondary County</b>	<b>Second RDC</b>	<b>Source (Point/ Nonpoint)</b>	
Greene			Nonpoint	
<b>Pollutants</b>	<b>Water Quality Standards</b>	<b>Required Reduction</b>	<b>TMDL ID</b>	<b>Date TMDL Established</b>
Fecal Coliform	1,000 per 100 ml (geometric mean Nov-April) 200 per 100 ml (geometric mean May-Oct)	84%		February 2002

Waterbody Name #2	Location	Miles/Area Impacted	Use Classification	Partially Supporting/ Not Supporting (PS/NS)
<b>Town Creek</b>	Hwy 15 to Richland Creek, S. of Greensboro	4	Fishing	Not Supporting
<b>Primary County</b>	<b>Secondary County</b>	<b>Second RDC</b>	<b>Source (Point/ Nonpoint)</b>	
Greene			Nonpoint (Urban Runoff)	
<b>Pollutants</b>	<b>Water Quality Standards</b>	<b>Required Reduction</b>	<b>TMDL ID</b>	<b>Date TMDL Established</b>
Fecal Coliform	1,000 per 100 ml (geometric mean Nov-April) 200 per 100 ml (geometric mean May-Oct)	97%		February 2002



## MANAGEMENT MEASURES, MEASURABLE MILESTONES AND SCHEDULE

**(i.e. Local codes and ordinances, Erosion and Sedimentation Control, Storm Water Management, Local water resource monitoring)**

The following table lists management measures that have been or will be implemented to achieve water quality standards and the load reductions established in the TMDL. The management measures, including regulatory or voluntary actions or other controls by governments or individuals, specifically apply to the pollutant and the waterbody for which the TMDL was written. A description is provided of how these management measures are/will be accomplished through reliable and effective delivery mechanisms, and how these management measures are/will help achieve the target TMDL. Included is the source of the pollutant, anticipated/past effectiveness of the management measure (very effective, somewhat effective, not effective), the current status (i.e. enforced, in-progress, planning), and measurable milestones and schedule. Milestones are used to measure progress in attaining water quality standards and to determine whether management measures are being implemented.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Permitting and inspection of septic tanks	Greene County Health Department	Issues permits for new septic tanks. Responds to complaints of septic tank failures. Prevents septic tank pump-out into streams.	Ongoing	Enforced	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
Fecal coliform	Residential septic tanks	1,2	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
All new septic tanks are permitted after inspection	Ongoing	Ongoing	Program is effective for new septic tanks. No control over existing sites.
Department responds to all complaints of failed septic tanks.	Ongoing	Ongoing	Program is effective only for systems where complaints are filed. Available remedial action limited to fines

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Cattle farming BMP's	NRCS, Extension Service	Promotes BMP's to reduce direct contact. The EQUIP program, nutrient management plans, and other programs are available to farmers with some monetary assistance (cost sharing).	Ongoing	Ongoing	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
Fecal coliform	Animals with direct access to streams, heavy use areas with runoff direct to streams.	1,2	Very effective where implemented.

Measurable Milestones	Schedule		Comments
	Start	End	
80% of agricultural operations will have implemented some or all BMP's targeted to reduce fecal coliform by 2014.	Ongoing	2014	BMP's are proven to be very effective where implemented. Barriers include cost to the property owner and lack of education.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Targeted sampling for E. coli	Greene County, City of Greensboro, volunteers	Systematic sampling of streams to identify sources of E. coli using methodology developed by the University of Georgia and supported by the Northeast Georgia Regional Development Center and Georgia EPD.	08/2003	Planned	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
Fecal coliform	Septic, sewer leaks, agriculture, urban runoff.	1,2	Very effective in identifying sources.

Measurable Milestones	Schedule		Comments
	Start	End	
By 2004, the geographic areas of greatest concern will be identified for all listed streams in the watershed	08/03	09/04	

<b>Management Measure</b>	<b>Responsible Government, Organization or Entity</b>	<b>Description</b>	<b>Enacted/ Projected Date</b>	<b>Status</b>	<b>Regulatory/ Voluntary</b>
Land Development Ordinances	Greene County, City of Greensboro planning departments and code enforcement	Subdivision ordinances, zoning ordinances provide for minimum setbacks and natural vegetated buffers on streams.	Current	Enforced	Regulatory

<b>Pollutant(s) Affected</b>	<b>Sources of Pollutant(s)</b>	<b>Impacted Waterbodies*</b>	<b>Anticipated or Past Effectiveness</b>
Fecal coliform	Urban runoff, septic tanks	1,2	Somewhat effective.

<b>Measurable Milestones</b>	<b>Schedule</b>		<b>Comments</b>
	<b>Start</b>	<b>End</b>	
All new development will meet setback and riparian buffer requirements.	Current	Ongoing	Riparian buffers are somewhat effective in reducing FC loads. Setback of septic tank drain fields is more effective.

<b>Regulation/Ordinance or Management Measure</b>	<b>Responsible Government, Organization or Entity</b>	<b>Description</b>	<b>Enacted/ Projected Date</b>	<b>Status</b>	<b>Regulatory/ Voluntary</b>
Active sewer leak detection program	City of Greensboro, Greene County	Sewer lines are regularly surveyed for damage and leakage	Ongoing	Enforced	Voluntary

<b>Pollutant(s) Affected</b>	<b>Sources of Pollutant(s)</b>	<b>Impacted Waterbodies*</b>	<b>Anticipated or Past Effectiveness</b>
Fecal coliform	Leaking sewer lines	1,2	Very effective.

<b>Measurable Milestones</b>	<b>Schedule</b>		<b>Comments</b>
	<b>Start</b>	<b>End</b>	
All sewer lines are inspected annually.	Ongoing	Ongoing	

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Seek to remedy the poorly-functioning septic tank systems by providing sewerage.	Greene County, City of Greensboro, private corporations	Seek ways to extend existing sewerage systems to areas with problems; examine possibilities of new sewerage systems.	Unknown	Ongoing	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
Fecal coliform	Poorly functioning septic tanks	1,2	Very effective.

Measurable Milestones	Schedule		Comments
	Start	End	
Unknown	Ongoing	Ongoing	This solution at the present time lacks a funding mechanism. As projects become feasible, they will be pursued.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Oconee River Basin Management Plan	Georgia EPD	Detailed management plan for the Oconee River Basin. The purpose of the plan is to develop and implement a river basin planning program to protect, enhance, and restore waters for the State of Georgia, which will provide for effective monitoring, allocation, use, regulation, and management of water resources.	Existing	To be revised 2003	Regulatory/ Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
Fecal coliform	Multiple	1,2	Very effective

Measurable Milestones	Schedule		Comments
	Start	End	
• Prepare/Update Draft River Basin Plan	2002	2003	Plan revision due in 2003.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Georgia Water Quality Control Act (OCGA 12-5-20)	GA DNR EPD	Makes it unlawful to discharge excessive pollutants (sediments, nutrients, pesticides, animal waste, etc.) into waters of the State in amounts harmful to public health, safety, or welfare, or to animals, birds, or aquatic life or the physical destruction of stream habitats	1964	Enforced	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
Fecal coliform	Multiple	1,2	Very effective

Measurable Milestones	Schedule		Comments
	Start	End	
EPD acts on complaints from affected parties	Ongoing	Ongoing	Detailed geographic coverage of tributaries and reaches of concern to identify specific sources
Detailed sampling of streams and tributaries	2003	2004	





## CRITERIA TO DETERMINE WHETHER SUBSTANTIAL PROGRESS IS BEING MADE

The following set of criteria will be used to determine whether any substantial progress is being made towards reducing pollutants in impaired waterbodies and attaining water quality standards. Discussion on each criteria is recorded in the space provided. Additional relevant criteria are presented in comments.

Percent of concentration or load change (monitoring program) \_\_\_\_\_

If modeling of the basin in 2008 (five year anniversary) shows a 20% decline in fecal coliform loadings, the plan will be successful. At ten years of implementation, the streams should all be de-listed for fecal coliform.

*If monitoring results show that it is unlikely that the TMDL will be adequate to meet water quality standards, revision of the TMDL may be necessary.*

- Categorical change in classification of the stream (delisting the stream is the goal) \_\_\_\_\_

Significant reductions in fecal coliform loading should result in reduction of Town Creek and Beaverdam Creek from “not supporting” to “partially supporting” its designated use.

- Regulatory controls or activities installed (ordinances, laws) \_\_\_\_\_

All new development will follow land development ordinances, including riparian buffer, setback, erosion and sediment control, and stormwater management practices. All new septic tanks will be permitted after inspection and appropriate testing.

- Best management practices installed (agricultural, forestry, urban) \_\_\_\_\_

By the plan target year of 2013, 100% of farms should be operating under BMP’s recommended by the NRCS and Extension Service.

100% of sewer lines will be examined annually.

All future residential and commercial development will have adequate septic tank systems, approved alternative wastewater disposal technologies, or connection to a sewerage system.

## COMMENTS

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Beaverdam Creek Watershed  
HUC 0307010111

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**Environmental Protection Division of the Department of Natural Resources,  
State of Georgia.**