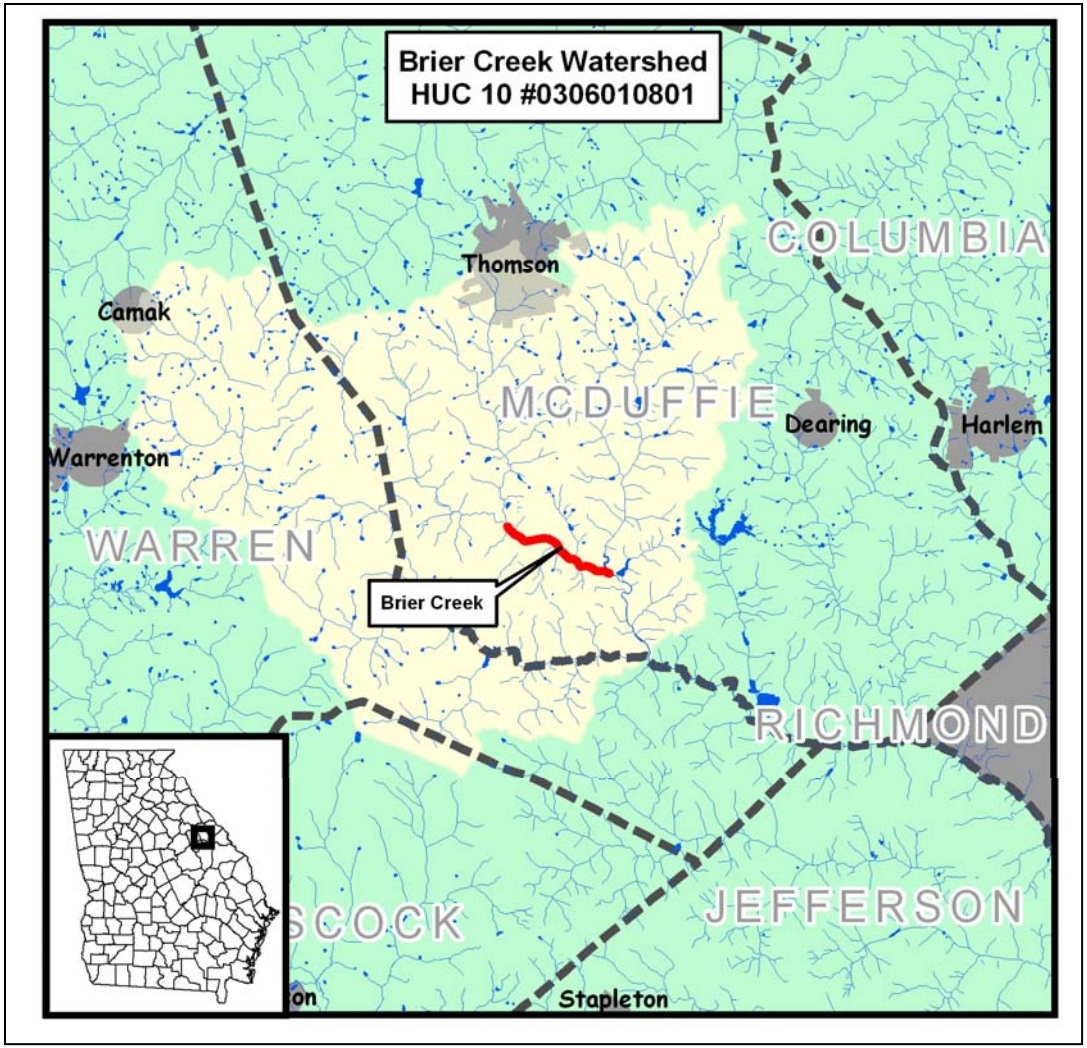
STATE OF GEORGIA
TIER 2 TMDL Implementation Plan (Revision # 01)
Segment Name: Brier Creek
River Basin: Savannah River Basin
Watershed: Brier Creek Watershed
Date: September 17, 2006

Local Watershed Governments:
Glasscock County, McDuffie County, Warren County, City of Thomson and City of Camak



I. INTRODUCTION

Total Maximum Daily Load (TMDL) Implementation Plans are platforms for evaluating and tracking water quality protection and restoration. These plans have been designed to accommodate continual updates and revisions as new conditions and information warrant. In addition, field verification of watershed characteristics and listing data has been built into the preparation of the plans. The overall goal of the plans is to define a set of actions that will help achieve water quality standards in the state of Georgia.

This implementation plan addresses the general characteristics of the watershed, the sources of pollution, stakeholders and public involvement, and education/outreach activities. In addition, the plan describes regulatory and voluntary practices/control actions (Best Management Practices, or BMPs) to reduce pollutants, milestone schedules to show development of the BMPs (*measurable milestones*), and a monitoring plan to determine BMP effectiveness.

Table 1. IMPAIRED SEGMENTS IN THE HUC 10 WATERSHED

IMPAIRED SEGMENT	IMPAIRED SEGMENT LOCATION	EXTENT (mi/ac)	CRITERIA VIOLATED	EVALUATION
Brier Creek	Big Brier Creek to Sweetwater Creek near Thomson	3 Miles	Fecal Coliform	Not Supporting

* Plan to be done by EPD

II. GENERAL INFORMATION ABOUT THE HUC 10 AND THE SPECIFIC SEGMENT WATERSHED

Following is a review of watershed characteristics including its size and location, political jurisdictions, physical features, land uses, and identified potential sources of pollutants that could cause or contribute to violations of water quality standards addressed in this TMDL Implementation Plan. New conditions or changes in information contained in the previous TMDL Implementation Plan should be in **bold** and underlined.

The Savannah River Basin encompasses more than 10,570 square miles and the river forms the border between the states of South Carolina and Georgia. The Savannah River begins in the Blue Ridge Mountains of North Georgia and South Carolina where the Seneca and Tugaloo Rivers meet and flow into Lake Hartwell. The Savannah River then flows southeast for more than 300 miles to the Atlantic Ocean. Upstream from Augusta, the river flows through Clarks Hill Reservoir and Lake Stephens. The river flows through three geographically distinct ecoregions, beginning its meandering path in the Blue Ridge, flowing through the rich soils of the Piedmont, and ending in the Coastal Plain where it forms a braided networks of tidal creeks that empty into the Atlantic Ocean.

The Savannah River Basin is further divided into 7 sub-basins or Hydrologic Units Codes (HUC). Each subbasin or HUC 8 is divided further into HUC 10s and HUC 12s. Brier Creek is located in HUC 10 #0306010801 as shown in yellow in the map on page 1. The HUC 10 extends into parts of Glasscock County, McDuffie County, and Warren County, Georgia. The impaired stream segment of Brier Creek is contained in McDuffie County, Georgia.

The HUC10 covers 71,584 acres and includes portions of the cities of Camak and Thomson. The data table below shows the current land use for the portions of Glascock, McDuffie, and Warren Counties that are within the HUC10. Most notably, agriculture and forestry land accounts for 63,117 acres, or more than 88% of the land within the watershed.

Current Land Use in HUC10 # 0306010801			
	Current Land Use	**Area in Feet**	**Acres**
Glasscock County	Unknown	42,038,023	965
McDuffie County (including the City of Thomson)	Agriculture/Forestry	1,658,030,321	38,063
	Commercial	11,888,446	273
	Industrial	12,555,935	288
	IM	5,783,214	133
	Public/Institutional	12,936,650	297
	Parks/Recreation/Conservation	3,509,528	81
	Residential	105,104,990	2,413
	RD	9,684,781	222
	ROAD	25,006	1
	Transportation/Communication/Utilities	1,040,689	24
	Undeveloped	2,921,487	67
	Total:	1,865,519,069	42,826
Warren County	Agriculture	359,892,255	8,262
	Commercial	1,362,984	31
	Forestry	719,494,660	16,517
	Industrial	54,627,678	1,254
	Public/Institutional	9,478,227	218
	Residential	25,395,496	583
	Transportation/Communication/Utilities	28,387,027	652
	Total:	1,198,638,327	27,517
City of Camak	Residential	2,051,597	47
	Commercial	67,993	2
	Industrial	206,086	5
	Public/Institutional	573,739	13
	Transportation/Communication/Utilities	1,671,709	38
	Forestry	7,417,184	170
	Total:	11,988,310	275
Total Land Use for HUC 10 #0306010801:		**3,118,183,729**	**71,584**
Source: CSRA Regional Development Center, 1994 and 2005			

The table below describes the current land use in the HUC 12. More than 67% of the HUC12 is characterized by forest and nearly 21% is row crops.

HUC12 Land Use for Brier Creek		
	Acres	Percentage
Open Water	124	.3%
Residential	719	2%
High Intensity Commercial, Industrial, Transportation	350	1%
Bare Rock, Sand Clay	42	.1%
Quarries, Strip Mines, Gravel Pits	152	.4%
Transitional	1,583	4.4%
Forest	24,163	67.5%
Row Crops	7,450	20.8%
Pasture, Hay	632	1.8%
Other Grasses (Urban, recreational; e.g. parks, lawns)	54	.2%
Woody Wetlands	530	1.5%
Emergent Herbaceous Wetlands	3	0%
Total	35,801	100%
Source: TMDL for Fecal Coliform in Savannah River Basin		

The current TMDL of the stream segment indicates possible sources of fecal coliform contamination in Brier Creek are nonpoint sources. Possible non-point sources of contamination include, but are not limited to, wildlife, agriculture, and urban development.

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 raccoons, beavers, muskrats, and to a lesser extent, river otters and minks. Population estimates of these animal species in Georgia are currently not available.

Deer Population per Square Mile	
County	2001-2005 Optimum Deer Population (number/mi²)
McDuffie County	35
Glascock County	35
Warren County	35

Fecal coliform bacteria contributions from deer to water bodies are generally considered less significant than that of waterfowl, raccoons, 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.

Agricultural livestock are also a potential source of fecal coliform to streams in the Savannah 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 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). The following table provides the estimated number of beef cattle, dairy cattle, goats, horse, swine, sheep, and chickens by category reported by county in the HUC10. This data was provided by the Natural Resources Conservation Service (NRCS) and is based on 2003 data.

Estimated Number of Livestock Animals by County									
County	**Beef Cattle**	**Dairy Cattle**	**Goats**	**Horses**	**Hogs**	**Sheep**	**Chickens-Layers**	**Chickens-Broilers Sold**	**Chickens-Breeders**
Glascock	4,000	-	500	55	150		-	-	-
McDuffie	4,850	650	600	800	100	200	-	-	-
Warren	8,260	1,450	1,950	2,200	1,050		-	-	-

Fecal coliform from urban areas can be attributed 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 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. 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.

A portion of the fecal coliform in the Savannah River Basin may be attributed to failure of septic systems and illicit discharges of raw sewage. The table presents the number of septic systems in each county of in the Brier Creek Watershed existing in 1990, based on U.S. 1990 Census Data, and the number existing in 2002, 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 twelve-year period from 1990 to 2002 is given.

Since 1990, Georgia has seen a substantial increase in the number of septic systems in most of its counties. This is generally a reflection of population increases outpacing the expansion of sewage collection systems during this period. The figure to the right compares the number of septic tanks existing in 1990 to those existing in 2002, as well as the number of repairs between 1990 and 2002.

Septic Tanks, 1990-2002				
County	**Existing Septic Systems (1990)**	**Existing Septic Systems (2002)**	**No. of Septic Systems Installed (1990 to 2002)**	**No. of Septic Systems Repaired (1990 to 2002)**
McDuffie	4,664	6,962	2,298	191
Warren	1,395	1,825	430	72
Glascock	708	918	210	6

Many smaller communities, such as some rural communities within McDuffie County, use land application systems (LASs) 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 likely contains fecal coliform bacteria, may discharge to nearby surface waters. There are fifteen permitted LAS systems located in the Savannah River Basin, one of which is the Dearing LAS located within McDuffie County (Permit no. GA02-007).

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 102 known landfills in the Savannah River Basin. Of these, 12 are active landfills, two have been permitted and are currently under construction, and 89 are inactive or closed. As shown in the table below, several of the older, inactive landfills in the HUC10 were never permitted.

Landfills Located within McDuffie, Warren and Glasscock Counties

Name	County	Permit No.	Type	Status
James - SR 17 S	McDuffie	097-009D	Dry Trash Landfill	Ceased accepting waste
McDuffie County - Mesena Road Phase 1	McDuffie	097-007D	Sanitary Landfill	Closed
McDuffie County - Wrightsboro Road/Moore Rd.	McDuffie	097-012D	Sanitary Landfill	Permit issued and lapsed
McDuffie County - Dallas Dr.	McDuffie	097-004D	Sanitary Landfill	Inactive
McDuffie County - Dallas Dr. Landfill	McDuffie	097-006D	Dry Trash Landfill	Inactive
National Homes (Pass - Brailsford)	McDuffie		Not Applicable	Inactive
Royal Trucking Co. (Pass - Brailsford)	McDuffie		Not Applicable	Inactive
Williams - Mesena Road	McDuffie	097-010D	Dry Trash Landfill	Ceased accepting waste
Camak	Warren		Not Applicable	Inactive
Norwood	Warren		Not Applicable	Inactive

Beyond non-point source, it is important to mention other significant activities relevant to water quality planning and management present in the HUC10. Within the HUC10, some activities that may influence the contamination of Brier Creek are Water Pollution Control Facilities (WPCFs), National Pollution Discharge Elimination System (NPDES), and Confined livestock and Confined Animal Feeding Operations (CAFOS).

Municipal and industrial wastewater treatment facilities' and WPCFs' discharges may contribute fecal coliform to receiving waters. There are 33 National Pollution Discharge Elimination System (NPDES) permitted discharges with flows greater than 0.1 MGD identified in the Savannah River Basin that discharge treated municipal wastewater. According to the 2002 Discharge Monitoring Report (DMR) data, the Waynesboro Water Pollution Control Facility (NPDES permit number GA0020231) is the only treatment facility affecting Brier Creek.

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. There are 60 permittees in Georgia, 8 of those are located in the Savannah River Basin. The MS4 located in Augusta-Richmond County (permit no. GAS000200) most directly affects Brier Creek. 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.

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 are 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). According to the Georgia Department of Agriculture, there are no CAFOs located in the Brier Creek Watershed that are registered or have land application permits.

II. CAUSES AND SOURCES OF SEGMENT IMPAIRMENT(S) LISTED IN TMDLs

Table 2 provides information contained in the current TMDL for the impaired water body. This includes the name and location of the impaired segment, the water quality criteria violated, and the wasteload and load allocations determined in the TMDL. Potential sources described in the TMDL may include domestic treatment facilities (M), industrial treatment facilities (I), urban runoff and sources (UR), and other nonpoint or unknown (NP) sources. By definition, "wasteload allocations" (WLA) are established for municipal and industrial treatment facilities and storm water discharges in permitted areas (WLAsw), while "load allocations" (LA) are established for nonpoint sources. **Wasteload allocations are assigned by EPD during the NPDES permitting process. They are not part of EPD's TMDL implementation planning process, which deals solely with non-point sources of pollutants.**

Table 2. WASTE LOAD AND LOAD ALLOCATIONS AND TMDLS FOR THE IMPAIRED SEGMENT

STREAM SEGMENT NAME	LOCATION	CRITERIA VIOLATED	WLA	WLAsw	LA	TMDL
Brier Creek	Big Brier Creek to Sweetwater Creek near Thomson	Fecal Coliform	Must meet water WQS	Must meet water WQS	1.16E+12	1.28E+12

Table 3 also contains information presented in the TMDLs that this plan is designed to address. This includes the criteria responsible for the impairment(s), the specific water quality standard(s) violated, potential sources/causes of impairment, and the needed reduction in source loads estimated in the TMDL.

Table 3. SOURCES OF IMPAIRMENT INDICATED IN THE TMDLs

CRITERIA VIOLATED : FC	WQ STANDARD	SOURCES OF IMPAIRMENT	NEEDED % REDUCTION (FROM THE TMDL)
Fecal Coliform Bacteria	- Geometric mean of 200 per 100 ml (May-October) - Geometric mean of 100 per 100 ml (November-April) - Single sample geometric mean of 4000 per 100 ml (Nov-April)	Non-Point Sources	57%

IV. IDENTIFICATION AND RANKING OF POTENTIAL SOURCES OF IMPAIRMENT

This section identifies and describes, in order of importance, the extent and relative contributions from sources of pollutants listed in Table 2 and identified through this TMDL implementation planning process. This description includes information presented in the current TMDL or TMDL implementation plan and/or collected during the TMDL implementation planning process that either verifies or alters estimates of contributions from the sources listed in the TMDL and repeated in Table 2.

Identification and ranking of potential sources or causes of impairment was performed through a visual survey of the watershed and involvement of the stakeholder group. The visual survey was conducted on February 23, 2007 and covered Brier Creek HUC12[1]. Images of the existing stream channel and land use conditions were recorded and specific locations of potential sources of polution were mapped using GPS technology (See Appendix C).

A visual survey of the area confirmed the current land use of the HUC12. According to current land use of the HUC12, more than 88% of the area is characterized as forestry or row crops. A visual survey of the area confirmed these land uses with the exception of a few animal operations. Along Quail Farm Rd there is a cow pasture near Fred Reeves Rd (Picture 1) and a Quail Farm (Picture 2) just north of the contaminated stream segment (Picture 3 and 4). There are two more pastures on Anderson Rd containing cow and horse operation as well as on Langham Rd (Pictures 5 and 6).

As discussed further in Section V., stakeholders ranked impairment in the following order: forestry and agriculture.

[1] All observations were based on the current conditions observed by CSRA Regional Development Center Staff at the time of the visual field survey.

Table 4 ranks potential sources of water quality impairments in order of importance as determined through this TMDL implementation planning process. A "rating scale" of 0.5 to 5 has been developed for this activity. "Rating A" is an estimate of the geographic extent of each potential nonpoint source as a percentage of the contributing watershed area, percent of stream miles affected, or number of acres. "Rating B" is an estimate of the relative contribution from each major source of the pollutant causing the impairment. The overall relative "Impact Ratings" for each source is calculated by multiplying Rating A by Rating B.

The following table provides guidance for rating the estimated extent (Rating A) and portion of the contribution (Rating B) from each potential source and cause.

Rating A: Estimated Geographic Extent of the Source or Cause in the Contributing Watershed	**Rating B:** Estimated Portion of Contribution from the Source to the Pollutant Load Causing the Impairment	**Rating**
None or negligible (approximately 0-5%)	None or negligible (approximately 0-5%)	0.5
Scattered or low (approximately 5-20%)	Scattered or low (approximately 5-20%)	1
Medium (approximately 20-50%)	Medium (approximately 20-50%)	3
Widespread or high (approximately 50% or more)	Widespread or high (approximately 50% or more)	5
Unknown	Unknown	UNK

Comments on the source of information used to determine the extent or contribution are entered in the applicable columns in Table 4. Appropriate management actions (i.e. watershed assessments, increased water quality monitoring, etc.) are suggested where available information is deemed inadequate to estimate the extent and relative contribution of significant potential sources.

Table 4. EVALUATION OF POTENTIAL SOURCES OF STREAM SEGMENT IMPAIRMENT

CRITERION 1: __Fecal Coliform.

POTENTIAL SOURCES	ESTIMATED EXTENT OF CONTRIBUTION		ESTIMATED PORTION OF CONTRIBUTION		*IMPACT RATING (A X B)*
	Comments	*Rating (A)*	Comments	*Rating (B)*	
Forestry	Medium	3	Unable to estimate portions	UNK	UNK
Agricluture	Meduim	3	Unable to estimate portions	UNK	UNK

V. STAKEHOLDERS

Public involvement through the stakeholder process is a vital component of TMDL implementation planning. Stakeholders with local knowledge can provide valuable information regarding their communities, impaired waters, potential sources of impairments, and BMPs that might be employed to improve water quality. This section describes outreach activities engaging local stakeholders in the TMDL implementation plan preparation process, including the number of attendees, meeting dates, and major findings, and recommendations.

A total of two stakeholder group meetings were held for the development of the Brier Creek TMDL Implementation Plan. The first meeting was held on January 9, 2007 and seven stakeholders were in attendance. The second stakeholder meeting was held on June 7, 2007 and there were four attendees. During the first stakeholder meeting, general background information on the TMDL process was provided and an open discussion of potential sources of polution was held.

During the second stakeholder meeting, a watershed characterization was conducted using the images collected during the field survey and locations of potential sources of polution according to the stakeholders. Ranking impairment sources was found to be difficult without additional monitoring data, but with the limited resources available the stakeholders ranked the impairments in the following order: forestry and agriculture. Without ongoing monitoring data, the stakeholders were not able to readily identify estimated percentages of pollution from each source.

Stakeholders were given an additional opportunity to comment on the TMDL Implementation planning process when they were asked to view the draft Implementation plan via the RDC website. Stakeholders were given a two week period to make comments and suggest changes to the Implementation plans before final drafts were submitted to EPD.

Following is a list of advisory committee or watershed group members who participated in this TMDL implementation planning process.

Table 5. STAKEHOLDER ADVISORY GROUP MEMBERS

Name	Organization	Address	City	State	Phone	E-mail
Steve Abbott	Georgia Forestry Commission Columbia-Richmond County District 3	2615 Tobacco Road	Hephzibah	GA	706-771-4922	richmondunit@gfc.state.ga.us
Vickie Baker	NRCS Thomson Service Center	226 Bob Kirk Road	Thomson	GA	706-595-1339	
Virginia Bradshaw	McDuffie County Health Department	PO Box 266	Thomson	GA	(706) 595-1740	vrbradshaw@gdph.state.ga.us
Jeff Browning	Columbia County Government Center	P.O. Box 498	Evans	GA	706-312-7166	Jbrowning@columbiacountyga.gov
Justin Cread Brown	NRCS Augusta Service Center	501 Greene Street	Augusta	GA	706-798-4070	
Margeret Doss	Columbia County Water	PO Box 204660	Martinez	GA	706-863-6928	
Al Frazier	EPD East Central District Office	1885-A Tobacco Road	Augusta	GA	706-792-7744	
Judy Gordon	Sierra Club (Savannah River Group)	P.O. Box 3434	Augusta	GA	706-650-8314	jgordon77@comcast.net
Fred Guerrant	McDuffie County	Box 7	Thomson	GA	706-595-5355	
Jimmie Harris	Central Savanah River RC &D	3456-D Peach Orchard Rd.	Augusta	GA		Jimmie.harris@ga.usda.gov
N. Max	Augusta-Richmond County Utilities Administration Office	360 Bay Street, Suite 180	Augusta	GA	706-312-4154	mhicks@augustaga.gov
Mark Inglett	Columbia County Storm Water Utility	4325 Evans-to-Locks Road	Evans	GA	706-863-6928	
Hazel Langrall	CSRA Land Trust	PO Box 148	Augusta	GA	706-312-5263	hazel@csrlt.org
Wendy Lowenthal	Columbia County SWCD Office	2029 Lumpkin Road	Evans	GA	706-312-7291	
L. MullisSidney, Jr.	UGA Cooperative Extension Office	602 Greene Street	Augusta	GA	706-821-2350	smullis@uga.edu

Robert Oliver	Engineering Department	1815 Marvin Griffin Road	Augusta	GA	706-796-5040	
Jacques Palmer	Columbia County	PO Box 204660	Martinez	GA	706-312-7245	
George Patty	Augusta-Richmond County Planning Commission	525 Telfair Street	Augusta	GA	706-821-1796	gpatty@augustaga.gov
Charles E. Phillips	UGA Cooperative Extension Office	3300B Evans To Locks Rd	Martinez	GA	706-868-3413	charlesp@uga.edu
Joe Riley	CSRA Resource Conservation & Development	3456 D Peach Orchard Road	Augusta	GA	706-798-7967	
Allen Sason	Augusta Utilities Department	360 Bay Street, Ste. 180	Augusta	GA	706-312-4154	asaxon@augustaga.gov
Hal Sharpe	Georgia Forestry Commission, McDuffie-Warren County, District 3	2088 Warrenton Hwy.	Thomson	GA	706-595-4661	mcduffieunit@gfc.state.ga.us
Frank M. Watson	UGA Cooperative Extension Office	PO Box 490	Thomson	GA	706-595-1815	fwatson@uga.edu
Cassandra Youmans, MD	Richmond County Health Department	950 Laney Walker Blvd.	Augusta	GA	(706)721-5800	cdyoumans@dhr.state.ga.us

Major stakeholders in attendance of the skateholder meetings are listed in Appendix A.

VI. MANAGEMENT MEASURES AND ACTIVITIES

Table 6A identifies significant BMPs that either have been or may be implemented in the future to address sources of impairment. The BMPs are in Column 1, organization responsible for implementation in Column 2, description of the measure(s) in Column 3, and sources of funding or other resources in Column 4. Column 5 contains one of the following status codes: (A) installed and active; (AE) active and will be enhanced or expanded; (R) required by law, regulation or permit conditions; (P) currently proposed, but not required; (NR) new recommendation; or (NE) enhanced existing recommendation. Column 6 shows the approximate date when the measure has or will be implemented. Column 7 contains an "extent" rating for the BMP or the percentage of individual sources to which the BMP has or will be applied (see the following table). Column 8 is an estimated BMP "effectiveness" rating that may be either provided by local experts or derived from technical guidance information. The following table provides guidance for rating the estimated management measure "extent" and "effectiveness" of each significant potential source.

BMP Extent (Percentage of Sources to Which the BMP Has or Will Be Applied)	**BMP Effectiveness** (Percent Removal of Pollutant by the BMP)	**Rating**
None or negligible (approximately 0-5%)	None or negligible (approximately 0-5%)	.5
Scattered or low (approximately 5-20%)	Low to medium (approximately 5-25%)	1
Medium (approximately 20-50%)	Medium to High (approximately 25-75%)	3
Widespread or high (approximately 50% or more)	High (approximately 75% or more)	5
Unknown	Unknown	UNK

Table 6A. MANAGEMENT MEASURES AND ACTIVITIES

GENERAL AND SPECIFIC MEASURES APPLICABLE TO CRITERION 1: __Fecal Coliform_____

Best Management Practice (1)	Responsibility (2)	DESCRIPTION (3)	Sources of Funding & Resources (4)	Status Code (5)	Target Date (6)	Extent Rating (7)	Effect Rating (8)
Federal Clean Water Act Section 404	EPA (situations involving forestry are normally referred to the GFC to determine compliance with this regulation)	Requires normal ongoing agricultural and silvicultural practice to adhere to BMPs and 15 baseline provisions for road construction and maintenance in and across waters of the US including lakes, rivers, perennial and intermittent streams, wetlands, sloughs in order to qualify for the exemption from the permitting process.		R	Ongoing	UNK	>75% when properly applied with to forestry road construction and maintenance
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.		A	Ongoing	UNK	
Georgia's Best Management Practices	Georgia Forestry Commission (matters involving enforcement are generally referred to GA EPD)	GFC program to inform landowners, foresters, timber buyers, loggers site preparation and reforestation contractors and others involved with silvicultural operations about commonsense, economical effective practices to minimize		A	Ongoing	UNK	>75% when properly applied to site preparation and

		nonpoint source and thermal pollution. GFC encourages and monitors compliance and conducts a complaint resolution program.					harvesting activities.
Georgia Forestry Commission Monthly BMP Assurance Examination	Georgia Forestry Commission (matters involving enforcement are generally referred to GA EPD)	In an effort to document "reasonable assurance" that water quality will be proactively protected during regular ongoing silvicultural operations, the GCF will offer a monthly BMP assurance examination of active sites. All active of ongoing sites will be identified either through monthly air patrol flights, courthouse records, riding the roads, notification or by landowners. Sites located within watersheds of specific biota (sediment) impaired streams will be given a higher priority to identify and conduct examinations.	Federal and State	A	Ongoing	UNK	
Memo to the Field: Application of BMPs to mechanical silvicultural site preparation activities for the establishment of pine plantations in the Southeast (Silviculture)	EPA/ US Army Corps of Engineers - (cases normally referred to GFC to make initial determination)	Identifies certain bottomland hardwood wetlands that should be subject to permitting if converting to pine plantations.	State	A	Ongoing	UNK	
Federal Farm Bill (Swampbuster, Ag)	US Department of Agriculture Natural Resource Conservation Service	Prohibits landowners participating in federal price support programs from converting forested wetlands to agriculture	Federal	A	Ongoing	UNK	
Partners for Fish and Wildlife	US Fish and Wildlife Services	This is a proactive, voluntary program that works with private landowners to restore fish and wildlife habitats on their land. The projects have several different focuses, but for the purpose of water quality the projects focus on stream and riparian restoration and restoration of rare species habitat.	Federal variable cost share	A	Ongoing	UNK	
Farm Bill 2002	United States Department of Agriculture / National Resources Conservation Services	Enhances long-term quality of our environment and conservation of our natural resources. This bill provides several opportunities for receiving grants to improve water quality.	Federal Cost-Share and Incentive Programs.	A	Ongoing	UNK	Varies with BMP applied.
Environmental Quality Incentives Program (EQIP)	Natural Resources Conservation Services	Voluntary program that provides technical and cost share assistance for protection of ground and surface water, erosion control, air quality, wildlife habitat, and plant health.	Federal 50% cost share with possible additional incentive payments	A	Ongoing	UNK	Varies with BMP applied.
Special Forestry/Wildlife Environmental	Natural Resources Conservation Services	Special funds allocated out of the EQIP program that will address forest road erosion/water quality, plant health, and wildlife habitat. This program has a separate ranking for rewarding	Federal 50% cost share with possible additional incentive payments	P	Ongoing	UNK	Varies with BMP applied.

Quality Incentives Program (EQIP)		money from the regular EQIP program.					
Wildlife Habitat Incentives Program (WHIP)	Natural Resources Conservation Services	Provides technical and cost share assistance for the creation of high quality wildlife habitat. Habitats of special concern include riparian areas and endangered and threatened species habitat.	Federal 75% of cost of the installation of practice provided	P	Ongoing	UNK	Varies with BMP applied.
Wetlands Reserve Program (WRP)	Natural Resources Conservation Services	Provides technical and financial assistance to landowners to enhance degraded wetlands degraded by farming or draining. There are three options with WRP to receive funds that have differing time agreements and easements resulting in different cost share. In all programs participants control access to the land, may lease or use land for hunting, fishing, and other passive recreational activities. Compatible uses are allowed as long as they do not degrade the wetland.	Federal Cost Share 1. Permanent Easement :Pays appraised value of land ($2,000/ acre cap) and 100% of costs of restoration. 2. 30-Year Easement : Pays 75% of appraised value of land and 75% of restoration costs. 3. Restoration Cost Share Agreement: Pays 75% of restoration costs, no easement on the property.	P	Ongoing	UNK	Effectiveness will vary with the specific application and must be individually determined.
Conservation Security Program (CSP)	Natural Resources Conservation Services	This is the first program that rewards farmers and ranchers for high levels of environmental stewardship. Producers on cropland, orchards, vineyards, pasture and range may apply for CSP regardless of size, type of operation, or crops produced. Land in other cost share programs is not eligible. CSP will first be offered in watersheds with greatest potential for improving water quality, soil quality and grazing land condition. An enhancement example is to install a riparian buffer.	Federal Cost Share There are three tiers of involvement, which result in differing expectations and cost share opportunities.	P	Ongoing	UNK	Effectiveness will vary with the specific application and must be individually determined.
Conservation Reserve Program (CRP)	Natural Resources Conservation Services / USDA Farm Services Agency	Provides technical assistance, rental payments and cost share funding to address specific natural resource concerns including: protection if ground and surface waters, soil erosion and wildlife habitat. Eligible practices include tree planting, grassed waterways, wildlife habitat buffers, and shallow water area for wildlife and filter strips.	Federal Annual rental payment for land taken out of production and 50% cost share for practice installation.	P	Ongoing	UNK	Varies with BMP applied.
GA Growth Planning Act (OCGA 12-2-8)	GA DNR, Department of Community Affairs, and local units of government.	Authorized GA DNR to develop minimum planning standards and procedures that local jurisdictions could adopt and enforce pertaining to the protection of river corridors, mountaintops, water supply, watersheds/reservoirs, groundwater recharge areas, and wetlands. Silvicultural activities may be exempted from permitting requirements provided the activity complies with BMPs.	State	A	Ongoing	UNK	
Water Bank Act	United States Department of Agriculture / Natural Resources Conservation Services	To preserve, restore and improve wetlands of the Nation and thereby to conserve surface waters to preserve and improve habitat for migratory waterfowl and other wildlife resources to retire lands not in agricultural production to enhance the natural beauty of the landscape and to promote comprehensive and total water management planning.10-year contracts with	Federal Annual payments may be made to participating owners, and the costs of conservation measures may be shared. Total annual payments to owners were limited to $10 million in any year.	P	Ongoing	UNK	Effectiveness will vary with the specific application and must be individually determined.

		landowners to preserve wetlands and retire adjoining agricultural lands.					
Georgia Rules and Regulations for Water Quality Control Chapter 391-3-6-.20 &. 21	Georgia Department of Agriculture / Georgia Environmental Protection Division for enforcement action.	Outlines the Swine and non-swine Feeding Operation Permit Requirements for Concentrated Animal Feeding Operations (CAFOs) with more than 300 animal units. CAFOs of more than 300 but equal to or less than 1000 animal units receive a land application system (LAS) permit. Larger CAFOs with more than 1000 but less than 3000 must obtain an NPDES permit from EPD.		A	Ongoing	UNK	Assume no discharge and >75% removal.
National Pollutant Discharge Elimination System (NPDES) Permit Regulations for CAFOS (40 CFR Part 122 & 412)	Environmental Protection Agency and Georgia Environmental Protection Division	Permitting program created under the Clean Water Act to protect and improve water quality by regulating Concentrated Animal Feeding Operations (CAFOs) and providing minimum permit requirements for CAFOs of more than 1000 animal units.	Federal and State	A	Ongoing	UNK	Assume no discharge and >75% removal.
Chapter 40-13-8 Animal Manure Handlers Rules of Georgia Department of Agriculture Animal Industry Division	Georgia Department of Agriculture	This requires that persons engaged in removing animal manure from livestock/poultry production areas, transporting animal manure on public roadways, or depositing animal manure to a premise other than its point of origin obtain a permit and follow rules to control animal disease, and outlines regulations for transportation, equipment and storage.	State	A	Ongoing	UNK	Effectiveness will vary with the specific application and must be individually determined.
Conservation of Private Grazing Land Program	United States Department of Agriculture / Natural Resources Conservation Services	This technical assistance will offer opportunities for: better grazing land management; projects for improving water quality include: protecting soil from erosive wind and water; conserving water; providing habitat for wildlife; sustaining forage and grazing plants.	Federal (Farm Bill 2002) This is not a Cost-Share Program.	P	Ongoing	UNK	Varies with BMP applied.
Section 319(h) Non-point Source Implementation Grant	Georgia Environmental Protection Division	Funds distributed through a competitive process to public agencies, regional development centers, State colleges and universities, and State agencies. Eligible projects include TMDL or Watershed Management Plan Implementation, BMP Demonstrations, and Information and Education.	Federal and State Cost Share Program. Recipient must provide 40% match.	A	Ongoing	UNK	Effectiveness will vary with the specific application and must be individually determined.

Work Sheet for Table 6B is designed to evaluate the capacity of existing, proposed, or pending BMPs to achieve nonpoint source load reductions specified in the TMDL as well as other BMPs that might be implemented to further reduce pollutant loadings from significant sources. This approach is intended to provide a usable local guide to adopt BMPs for achieving water quality goals, establishing priorities for grant or loan programs, and identifying priorities for local watershed assessments and protection plans.

Columns 1 and 2 contain significant potential sources and their corresponding impact ratings (from Table 3). Column 3 lists significant BMPs applicable to each significant source (from Table 6A). Column 4 is a very brief "evaluation summary", developed in conjunction with local stakeholders, of whether existing or proposed BMPs will achieve load reductions identified in the TMDL. Column 5 contains a summary of additional information needed to further determine significant sources and their relative contributions, and could contain recommendations for water quality monitoring, watershed assessments, or additional data acquisition. If current or proposed management measures are judged inadequate to achieve the load reductions for significant sources identified in the TMDL, additional management measures that could effectively reduce pollutant loads should be listed in "Additional Information / Measures Needed" (Column 5) and included as new enhanced existing recommendations (NE) or new recommendations (NR) under "Status Code (5)" in Table 6B and under "Milestones" (Table 9).

Work Sheet for Table 6B. EVALUATION OF GENERAL AND SPECIFIC MANAGEMENT MEASURES AND ACTIVITIES APPLICABLE TO EACH CRITERION

APPLICABLE TO CRITERION 1: Fecal Coliform Bacteria**.**

SIGNIFICANT POTENTIAL SOURCES (1) (From Table 3)	**IMPACT RATING (2)** (From Table 3)	**APPLICABLE BMPs (3)** (From Table 6A)	**EVALUATION SUMMARY (4)**	**ADDITIONAL INFORMATION / MEASURES NEEDED (5)**
Non-Point Sources	UNK	Georgia's Best Management Practices		Additional monitoring.
		Section 319(h) Non-point Source Implementation Grant		Education for hunters, farmers, foresters, citizens, and other interested parties.
		Environmental Quality Incentives Program (EQIP)		

Table 6B identifies new enhancements to existing measures (NE) or new recommended measures (NR) that could improve or supplement current or proposed management measures listed in Table 6A, where current and required measures have been judged inadequate for achieving the load reductions from significant sources identified in the TMDL. After further evaluation generated in the Work Sheet for Table 6B, the additional management measures proposed in Table 6B have been determined more effective in reducing pollutant loads from the most likely sources of impairment. The BMPs are listed in Column 1, organization responsible for implementation in Column 2, description of the measure(s) in Column 3, and sources of funding or other resources in Column 4. Column 5 contains one of the following status codes: (NE) enhanced existing measure or (NR) new recommended measure. Column 6 shows the approximate date when the measure has or will be implemented. Column 7 contains an "extent" rating for the BMP or the percentage of individual sources to which the BMP could be applied (see the following table). Column 8 is an estimated BMP "effectiveness" rating that may be either provided by local experts or derived from technical guidance information. The following table provides guidance for rating the estimated management measure "extent" and "effectiveness" of each significant potential source.

BMP Extent (Percentage of Sources to Which the BMP Has or Will Be Applied)	**BMP Effectiveness** (Percent Removal of Pollutant by the BMP)	**Rating**
None or negligible (approximately 0-5%)	None or negligible (approximately 0-5%)	.5
Scattered or low (approximately 5-20%)	Low to medium (approximately 5-25%)	1
Medium (approximately 20-50%)	Medium to High (approximately 25-75%)	3
Widespread or high (approximately 50% or more)	High (approximately 75% or more)	5
Unknown	Unknown	UNK

Table 6B. RECOMMENDED ADDITIONAL MANAGEMENT MEASURES AND ACTIVITIES TO ACHIEVE LOAD REDUCTIONS (COMPILED FROM TABLE 6A AND COLUMN 5 IN WORK SHEET FOR TABLE 6B)

APPLICABLE TO CRITERION 1: Fecal Coliform.

BEST MANAGEMENT PRACTICE (1)	RESPONSIBILITY (2)	DESCRIPTION (3)	SOURCES OF FUNDING & RESOURCES (4)	STATUS CODE (5)	TARGET DATE (6)	EXTENT RATING (7)	EFFECT. RATING (8)
Outreach and Education	State, RDC, local, NRCS, County Extension Service	Develop program to educate hunters and property owners to discourage the placement (illegal dumping) of animal (both wild game and domestic) carcasses in or near bodies of water, specifically streams on the 305(b)/303(d) list.	State, Federal, local	NR	Ongoing	UNK	UNK

VII. MONITORING PLAN

Water quality monitoring serves several purposes, including obtaining data to determine sources of pollution, supporting management decisions, describing baseline conditions, and evaluating the effects of management measures on water quality. This section describes parameters to be monitored, status, whether monitoring is required for watershed assessments or storm water permits, and the intended purpose. Submittal of a Sampling and Quality Assurance Plan (SQAP) for EPD approval is mandatory if monitoring data is to be used in support of listing decisions.

Water quality data used to evaluate the criteria violated are less than five years old? Yes [✓] No [ ].

Table 7. MONITORING PLAN

PARAMETER (S) TO BE MONITORED	RESPONSIBLE ENTITY	STATUS (CURRENT, PROPOSED, OR RECOMMENDED)	TIME FRAME		PURPOSE (If for listing assessment, date of SQAP submission)
			START	END	
Fecal Coliform	EPD, USGS	Current	Every 5 years	Ongoing	Ongoing monitoring of impaired stream segement inorder to update state 305(b) and 303(d) lists of impaired waters.

VIII. PLANNED OUTREACH FOR IMPLEMENTATION

Table 8 lists and describes outreach activities that will be conducted to support this implementation plan, or help to improve water quality in the segment watershed. Identify either the projected start date or completion date. At a minimum, this is to include all education/outreach activities defined in the contractual Scope of Work for TMDL Implementation Plan development or revisions.

Table 8. PLANNED OUTREACH FOR IMPLEMENTATION

RESPONSIBILTY	DESCRIPTION	AUDIENCE	START OR COMPLETION DATE
CSRA Regional Development Center	The RDC will inform all governing bodies affected or potentially affected by the plan. The CSRA RDC will also make the TMDL Implementation plan available to interested stakeholders.	Any interested stakeholder or governing body in the 13 county CSRA region.	Ongoing
CSRA Regional Development Center	The CSRA RDC will meet with and discuss the plan with interested parties.	Any interested stakeholder or governing body in the 13 county CSRA region.	December 31, 2007

IX. MILESTONES AND MEASURES OF PROGESS FOR BEST MANAGEMENT PRACTICES (BMPs) AND OUTREACH

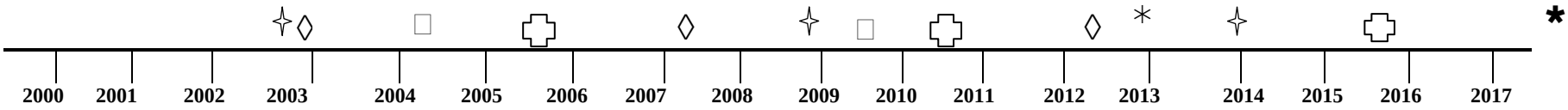
Table 9 tracks and reports progress of significant management measures identified in Tables 6A, 6B, and other sections of this plan, including outreach, additional monitoring and assessments, and enhancement or installation of BMPs. Significant activities and the target dates of accomplishment are listed under STATUS, and comments are provided on the effectiveness of the management measure, the degree of community support, what was learned, how the measure might be improved in the future, and other pertinent observations.

Table 9. MILESTONES AND MEASURES OF PROGRESS

BEST MANAGEMENT PRACTICE	RESPONSIBLE ORGANIZATION	STATUS PROPOSED	STATUS INSTALLED	COMMENT
Federal Clean Water Act Section 404	EPD	Ongoing		
Georgia Water Quality Control Act (OCGA 12-5-20)	GA DNR EPD	Ongoing		
Georgia's Best Management Practices	Georgia Forestry Commission , GA EPD	Ongoing		

PROJECTED ATTAINMENT DATE

The projected date to attain and maintain water quality standards in this watershed is 10 years from receipt of this TMDL Implementation Plan by Georgia EPD.



- Projected EPD Basin Group Monitoring
- New TMDLs Completed
- Revised or Updated TMDL Implementation Plan Received by EPD
- Evaluation of Implementation Plan/water Quality Improvement
- Project Attainment for Plans Prepared in 2002
- Project Attainment for Plans Prepared in 2007

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Date Submitted to EPD: August 1, 2007 Revision: 01

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APPENDIX A.

STAKEHOLDERS

All stakeholders with a major interest in this watershed, including local governments, agricultural or commercial forestry organizations, significant landholders, businesses and industries, and local organizations, including environmental groups and individuals, are listed in Table 5. Attendees of stakeholder meeting on January 9, 2007 and June 7, 2007 are listed in the table below.

Jan. 9, 2007	June 7, 2007
Harriet Bryant, EPD	Jimmie Harris, CSRA RC&D
Margaret Doss, Columbia County Water	Fred Guerrant, McDuffie County
Fred Guerrant, McDuffie County	Allen Saxon, Augusta Utilities Dept.
Jimmie Harris, CSRA RC&D	Paul DeCamp, Augusta-Richmond County Planning Commission
Jacques Palmer, Columbia County	
George Patty, Augusta-Richmond County Planning Commission	
Frank Watson, UGA Cooperative Extension Office	

APPENDIX B.

UPDATES TO THIS PLAN

If this is a major or minor revision of an existing plan, this section will describe the date, section or table updated, and a summary of what was changed and why. Georgia EPD has developed guidelines for revising existing TMDL implementation plans.

N/A – This is a new TMDL implementation plan.

APPENDIX C.

FIELD SURVEYS, NOTES, PHOTOGRAPHS, AND MAPS.

Picture 1

Picture 2

Picture 3

Picture 4

Picture 5

Picture 6