

STATE OF GEORGIA

TIER 2 TMDL Implementation Plan (Revision # 01)

Segment Name: BEAVERDAM CREEK **Date:** June 15, 2007

River Basin: Savannah River Basin

Local Watershed Governments:

Elbert, Franklin and Hart Counties

Cities of Elberton, Bowman, Royston, Canon
and Bowersville

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.

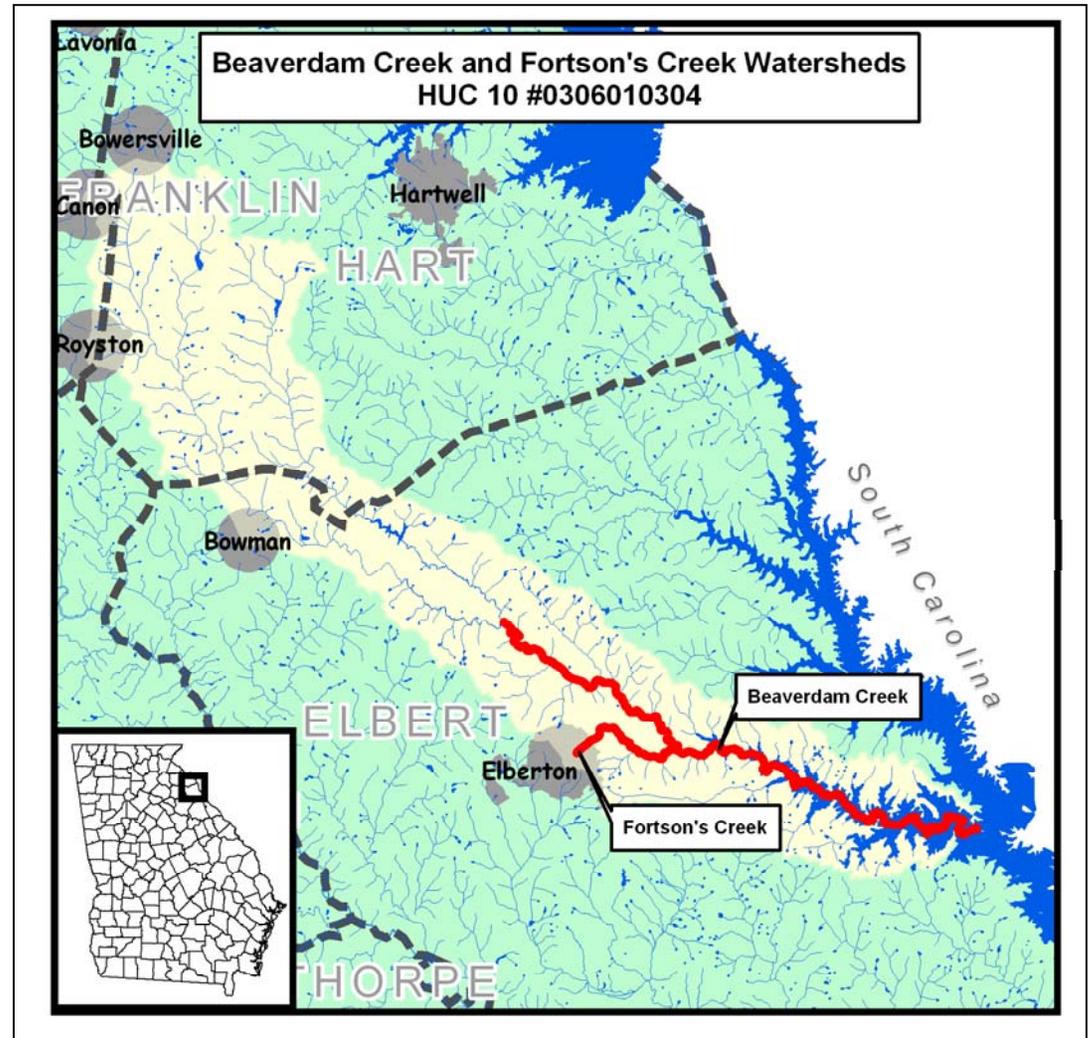


Table 1. IMPAIRED SEGMENTS IN THE HUC 10 WATERSHED

IMPAIRED SEGMENT	IMPAIRED SEGMENT LOCATION	EXTENT (mi/ac)	CRITERIA VIOLATED	EVALUATION
Beaverdam Creek	Confluence of N & S Beaverdam Crks to Savannah River	22 miles	Fecal Coliform	NS
Fortson's Creek	Elberton to Beaverdam Creek	4 miles	Fecal Coliform	NS

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

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 are in **bold** and underlined.

The HUC 10 # 0306010304 encompasses parts of Hart and Elbert counties as well as a very small portion of Franklin County. Cities that lie partially within the watershed are Elberton, Bowman, Royston, Canon and Bowersville. There are two TMDL stream segments within this HUC 10 watershed, Beaverdam Creek and Fortson's Creek. Both segments are not supporting their designated use of fishing due to fecal coliform impairment. Fortson's Creek is a tributary of Beaverdam Creek. The HUC 10 watershed is 78,847.9 Acres.

2004 NEGRDC Land Use for Beaverdam Creek TMDL Segment Watershed

Land Use Category	Area (Acres)	% Of total
Residential	4584.7	10%
Commercial	2235.0	5%
Industrial	303.2	1%
Transportation/Communication/Utility	1590.5	3%
Park/Recreation/Conservation	7953.4	17%
Public/Institutional	492.4	1%
Mining/Extraction	733.5	2%
Crop Production	2709.3	6%
Animal Production	5265.0	11%
Forestry/Logging	22071.7	46%
Other	41.2	0%
Total	47980.0	100%

The Beaverdam Creek (Confluence of N & S Beaverdam Creeks to Savannah River) TMDL segment is 22 miles in length and flows just south of Elberton into Lake Richard B. Russell (which is categorized as park/conservation/recreation land use). The data that listed the segment was collected at the Ruckersville Road crossing in 2002. The TMDL segment is entirely within Elbert County; therefore TMDL implementation efforts will be concentrated in Elbert County and the Cities of Elberton and Bowman. The Elbert County portion of the watershed is 47,980 acres

Primary land uses in the watershed are forestry/logging, animal production and residential. Forestry/logging accounts for 46% of land use and represents the majority of land in close proximity to the stream segment. The primary source on forestry/logging land is wildlife, but there can be human sources during hunting season. Animal production accounts for 11% of the watershed land use and consists primarily of pasture for cattle and poultry and egg production. Residential land accounts for 10% of the watershed. The watershed is primarily rural in nature, but the city of Elberton is becoming more urbanized with commercial land use replacing residential and other land uses. The population of Elberton is steadily decreasing

(from 7,107 in 1960 to 4,743 in 2000). The population of Elbert County, however, is increasing. The cities of Elberton and Bowman both have sanitary sewer that serves most areas within the city limits. Elberton still has some areas that are served by individual septic systems, however, and many of them may be failing. Residences in the rest of the watershed are on septic systems.

Elberton Utilities operates the Fortson's Creek Water Pollution Control Plant located about 2.75 miles upstream of the Beaverdam creek TMDL segment. It discharges into Fortson's Creek, which is a tributary to Beaverdam Creek and is also a TMDL segment. It is the only NPDES discharge in the watershed (the Bowman Pond lies just outside the Beaverdam Creek watershed). The Fortson's Creek WPCP had two violations of its permit between July 1998 and June 2002. There have been several instances of spills and increased flows that have increased levels of fecal coliform in Fortson's Creek and may have impacted Beaverdam Creek. There were also two Sanitary Sewer Overflows (SSOs) in Elberton (one in 1995 and one in 2004) that may have impacted Beaverdam Creek.

There are four landfills in the watershed, the Elberton-Elbert County Landfill, the Old Middleton Rd Phase 1 and 2 landfills, and the Hull Chapel Rd. landfill. The Old Middleton Rd and Hull Chapel Rd landfills are all closed and have permits. The Elberton-Elbert County landfill is inactive and has not been permitted.

Lake Russell is the primary water source for the city of Elberton. Beaverdam Creek is an emergency water source. Both drinking water sources have a Source Water Assessment Plan (SWAP) that was developed in July 2002. Of the sources identified in the Beaverdam Creek intake SWAP, the following are potential sources of fecal coliform (in parentheses is the source priority as determined by the SWAP): Non-sewer areas within a 7 mile radius (medium priority), Non-sewer areas outside a 7 mile radius (low priority), City of Elberton Landfill (low priority), two confined animal

feeding operations (low priority), agricultural areas (low priority), forestry areas (low priority), and urban areas (low priority). Of the sources identified in the Lake Russell intake SWAP, the following are potential sources of Fecal Coliform: Fortson's Creek WPCP (high priority), Elbert County Landfill-Hull Chapel Rd (high priority), Silt Mill Wastewater Pump Station (high priority), septic areas within a 7 mile radius (high priority), Beaverdam Elementary School (medium priority), wastewater pump station (medium priority), Elbert County closed landfills (low priority), three CAFOs (low priority), septic areas outside a 7 mile radius (low priority), urban areas (low priority), forestry areas (low priority), and agricultural areas (low priority). Lake Russell is used for recreation and often has heavy boat traffic. This recreation can lead to more fecal coliform pollution from humans, boats, and pets.

The Elbert County Comprehensive Plan was written in 2003. Elbert County adopted the small water supply watershed protection criteria in 2001. In 2005, Elbert County adopted large water supply watershed protection criteria for the Lake Russell intake. The small water supply watershed protection criteria require a 100 ft. vegetated buffer and a 150ft. septic drain field and impervious surface setback for streams within a 7-mile radius upstream of the intake and a limit of 25% impervious surface in the watershed or existing use, whichever is greater. This does not apply to existing land use. Single family residential use is allowed within the buffer provided the residence is located on a two acre tract of land that is not occupied by any other residence and that the septic drain field is not located in the 150ft setback. These criteria do not apply to new or existing agricultural land use provided that best management practices are followed and that they do not impair water quality. The plan also states that Elbert County will make an ongoing effort to minimize the negative environmental impacts of development. Elbert County and the City of Bowman adopted a wetlands protection ordinance consistent with DNR wetland protection criteria. According to the comprehensive plan, soils in the lower (southeastern) third of the county are not suitable for septic systems unless they have more drain lines or a larger drain field.

According to Elberton's Code of Ordinances, buffer requirements are consistent with state standards of 25ft. for all state waters and a 50ft. buffer for streams classified as trout streams. All individuals involved with land disturbing activity must be trained and certified based on their level of involvement. The code of ordinances requires that pet waste be removed from public property, prohibits any illicit discharges of pollutants into the municipal waterworks, and requires any residence or business within 200ft. of a sanitary sewer line to be connected to sanitary sewer.

The US Army Corps of Engineers led the 2004 and 2005 Rivers Alive Cleanups on Lake Richard B. Russell. The Broad River Watershed Association is active in Broad River watershed in Elbert County but not in the Beaverdam Creek watershed. Elbert County is in the Oconee River RC&D region. The Oconee River RC&D provides Erosion and Sedimentation Control training that is available to all member counties. In addition, they have led EPA 319(h) funded programs in other counties in the region, but these have not been active in Elbert County.

III. 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 waste load 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 (WLA_{sw}), 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	WLA _{sw}	LA	TMDL
Beaverdam Creek	Confluence N & S Beaverdam Creek to Savannah River	Fecal Coliform	9.37E+10 counts/30days		7.64E+12 counts/30days	8.59E+12 counts/30days

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 nonpoint 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 (FC)	1,000 per 100 ml (geometric mean Nov-April)	NP	68
	200 per 100 ml (geometric mean May-Oct)	M	

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.

Sources in the Beaverdam Creek TMDL segment watershed were identified by conducting visual field surveys of the stream crossings and the watershed land use. Prior to the visual field surveys, point data from the Georgia Environmental Protection Division were compiled and analyzed to determine the location of any point sources of pollution in the watershed. This data included the location of NPDES permitted facilities, landfills, LAS and CAFOs. In addition, 2005 aerial photos from the National Agricultural Imagery Program were used to determine possible sources of fecal coliform pollution within the watershed. 2004 RDC land use data were also consulted to determine the extent of potential sources of fecal coliform. One purpose of the TMDL implementation plan is to compare the most recent RDC land use data with the 1995 land use data that were used in the development of the TMDLs. However, in the case of the Beaverdam Creek segment watershed, the TMDL land use data included the portion of the watershed that is in Hart County, which is outside of our region, so comparison was not possible.

The visual field survey consisted of a windshield survey of land use in the watershed and a visual assessment of stream condition at road crossings. The stream segment was not conducive to walking due to private property. Sources investigated during the windshield survey were primarily animal production facilities, because these are easy to identify from aerials and it can be readily apparent if they are not using certain Best Management Practices, such as animal exclusion from streams. These facilities were considered to be priority sources if animals had access to the stream or there were not best management practices in place to prevent runoff of fecal matter into the stream. Notes and photographs were taken to document observations of the stream segment and the surrounding watershed.

The field surveys were presented to stakeholders at a TMDL implementation meeting. Any comments that were made in the meeting were included in the visual field survey report, which can be found in Appendix C of this document. The field surveys were posted on the NEGRDC website TMDL page.

Point Sources

There are two urbanized areas in the Beaverdam Creek watershed (Elberton and Bowman), which have sewer systems. Sewer line leaks could contribute to fecal coliform pollution. No sewer line leaks were witnessed during the survey, but there were two Sanitary Sewer Overflows (SSOs) in Elberton (one in 1995 and one in 2004) that may have impacted Beaverdam Creek. Sewered area covers about 4% of the watershed. Illicit discharges to the Elberton storm water system are another potential source.

The only NPDES permitted facility in the watershed is the Fortson's Creek Water Pollution Control Plant. It discharges into Fortson's Creek, which is a tributary to Beaverdam Creek and is also a TMDL segment. The Fortson's Creek WPCP had two violations of its permit between July 1998 and June 2002. There have been several instances of spills and increased flows that have increased levels of fecal coliform in Fortson's Creek and may have impacted Beaverdam Creek.

Non-Point Sources

Wildlife

46% of the Beaverdam Creek watershed is classified as forestry/logging. The primary source of fecal coliform in forested areas is most likely wildlife; however, it is likely that there are human sources as well. A 2005-2006 update to the Georgia DNR Wildlife Resources Division's 2005-2014 Deer Management Plan calculates the actual, average deer population for Elbert, Madison, and Oglethorpe Counties (Deer Management Unit 5) to be 34.1 deer/forested square mile. That would equate to about 1,176 deer in the watershed. Forested designates all areas that are not residential, commercial or industrial, cropland or open pastureland. Projected optimum deer density (number of deer that the habitat can support in full health) for DMU 5 remains at 35 deer/square mile. Contributions from deer to coliform bacteria loadings in water bodies are considered less significant than contributions made from water fowl, raccoons and beavers. Much of the TMDL segment is bordered by forestry/logging land, so wildlife have access to all areas of the segment and many areas on the tributaries.

Animal Production

Animal Production accounts for 11% of the watershed land use. 2006 estimated livestock populations for Elbert County are as follows, 7,000 beef cattle, 300 dairy cattle, 600 goats, 550 horses, 80 sheep, 444,000 chickens (layer), and 4,094,000 chickens (broilers). During the watershed survey, we visited several farms to determine if there was in fact animal production at the site and to make observations of any activity that could contribute to fecal coliform loading, such as animal access to the stream. No such activities were observed, however, there was limited visibility from the road. GIS data shows that many farms in the watershed have tributaries flowing through their grazing fields, therefore, it is likely that there are some farms that are a significant source due to lack of proper Best Management Practices and proximity to streams. There is one CAFO (Hudson Farms) in Elberton that houses 4,000 swine. The exact location of the CAFO is unknown, because it was not included in the CAFO GIS layer provided by EPD. It may or may not be within the watershed.

Failing Septic Systems

Residential accounts for 10% of watershed land use. The majority of residences in the watershed are served by individual septic systems. The cities of Elberton and Bowman both have sanitary sewer lines, but these serve only a small portion of the watershed. It is likely that there are failing septic systems in the watershed, because there is no ordinance requiring maintenance. There is a requirement for permitting of septic systems upon installment. In Elbert County there were 4,436 septic systems in 1990 and 6,790 septic systems in 2002. 183 systems were repaired from 1990-2002. It is estimated that there are a little over 1,000 residential parcels with septic systems in the watershed assuming that all residences within

200ft. of a sewer line have been connected to sewer. About 154 of these parcels are adjacent to a stream in the watershed, and 4 of them are adjacent to the TMDL segment.

Urban Runoff

Storm water runoff is increased in urban areas due to impervious surfaces. Runoff can carry pet, human and wildlife waste to streams.

Landfills

There are four landfills in the watershed, the Elberton-Elbert County Landfill, the Old Middleton Rd Phase 1 and 2 landfills, and the Hull Chapel Rd. landfill. The Old Middleton Rd and Hull Chapel Rd landfills are all closed and have permits. The Elberton-Elbert County landfill is inactive and has not been permitted.

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)	
Wildlife	Forestry/logging is 46% of land use	3	Wildlife likely to be abundant and some in close proximity to stream	1	3
Animal Production	11% of watershed land use	1	In close proximity to stream segment, cattle have access to streams	3	3
Sewer Line Leaks/SSOs	Sewered area covers about 4% of watershed	.5	Sewer lines run along streams, failures have been documented	3	1.5
Septic Systems	Residential is 10% of land use	1	Systems aren't in close proximity to stream, but failures have been documented	1	1
Urban Runoff (pet waste, impervious surface)	About 4% of watershed is urbanized	.5	Urban runoff drains directly to streams	3	1.5
Illicit discharges/Illegal dumping		UNK		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, recommendations, and approvals.

Stakeholders were involved in the TMDL implementation planning process through public meetings about TMDLs and TMDL implementation, through invitation to participate in visual field surveys, through county meetings to draft the plans, through one-on-one meetings, and through correspondence via e-mail and telephone.

Stakeholder Identification

Stakeholders were identified by compiling lists of stakeholders who participated in previous implementation activities and by reviewing TMDL implementation plans written by other RDCs to determine which organizations they brought to the table. Others were identified by word of mouth.

Press releases were sent out to local newspapers announcing public meetings, and memorandums were sent to previously identified key stakeholders. The Press releases and memos suggested that stakeholders invite others who are interested in water quality to the meetings as well. At the meetings it was made known that the stakeholder advisor group is ever expanding and that anyone with a vested interest in water quality should be added.

Elbert/Madison/Oglethorpe Counties Public Meetings

November 13, 2006 (14 attendees)

- Viewed video entitled “Watershed Wisdom: Georgia’s TMDL Program”
- PowerPoint presentation entitled “Introduction to TMDL Implementation “ was presented by RDC

March 6, 2007 (11 attendees)

- Presented visual field surveys
- Presented case studies of BMP implementation and 319 (h) projects used for TMDL implementation

Stakeholder Comments/Questions

- Concerns were raised about the accuracy of the RDC land use layer on the maps
 - GIS staff found more updated land use layers, but they are from 2004 so any changes since 2004 will not be included
 - Land use layers are parcel based. Parcel land use is determined by aerial photos and tax data from the internet. Some parcels may be labeled inaccurately

- Concerns were raised that the listing of water bodies is based on very limited sampling
 - Mary Gazaway of EPD responded that as of 2002, 4 samples must be collected within a 30-day period and the geometric mean of those samples has to exceed the limit for the stream to be listed. EPD recommends that sampling be conducted quarterly.
- Dudley Hartel mentioned that Madison County has a Adopt-a-Stream Program
- Ruth Ann Tesanovich said Madison County is in the process of revising its comprehensive land use plan. As part of the proposed revision the riparian buffers would be increased to 50ft. Property Owners for Commonsense Growth recommended it be increased to 75ft.
 - The revision was passed with riparian buffer requirements being increased to 50ft.
- Can volunteers submit water quality data for listing/delisting decisions?
 - Yes, but they must have an EPD approved Sampling Quality Assurance Plan and the samples must be analyzed in an EPD certified lab
 - UGA (Engineering or Ecology) has an EPD certified lab that volunteers can use (ask Mark Risse)
 - Municipal Wastewater Treatment Facilities have EPD certified labs
- The suggestion was made that future meetings be conducted during the day so there will be more participation
- Another suggestion was to meet with each county separately at the county seat

Elbert County Advisory Group Meeting

April 26th, 2007

(7 Attendees)

- Presented current funding options, current water quality ordinances and management measures, and new recommended management measures.
- Revised plans based on stakeholder comment/suggestion
- Sent source ratings for each stream segment by e-mail after meeting

Stakeholder Comments/Suggestions

- Stakeholders verified that the land use data was pretty accurate for Elbert County
- After the recommendation was made that Elbert County increase the riparian buffer requirement on state waters, a stakeholder questioned the scientific basis for increased riparian buffer widths
 - Follow up: The UGA River Basin Center's Riparian Buffer Guidebook was e-mailed to stakeholders that were present at the meeting
- Sewer line leak detection is conducted on an as needed basis

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/ORG	ADDRESS	CITY	STATE	ZIP	PHONE	E-MAIL
Bob Thomas, Elbert County Board of Commissioners	45 Forest Ave.	Elberton	GA	30635	706-283-20000	ecbocthomas@bellsouth.net
Byron Stovall, City of Elberton Water Department	234 N McIntosh St.	Elberton	GA	30635	706-213-3169	bstovall@cityofelberton.net
Cindy Churney, Clerk, City of Elberton	P.O. Box 70	Elberton	GA	30635	706-213-3100	cchurney@cityofelberton.net
Anna Grant Jones, Elbert County Development Authority	P.O. Box 63	Elberton	GA	30635	706-213-7600	ecdev@elberton.net
Katrina White, Natural Resource Conservation Service	333 Heard St.	Elberton	GA	30635	706-283-3021 ext. 3	Katrina.white@ga.usda.gov
Forrest Ferguson, Natural Resource Conservation Service	88 Maret St.	Hartwell	GA	30643	706-376-5451 ext. 3	Forrest.ferguson@ga.usda.gov
Jason Hackett, Fortson's Creek WPCP	234 N. McIntosh Street	Elberton	GA	30635	706-213-3162	

Major stakeholders in the watershed are listed in Appendix A.

VI. MANAGEMENT MEASURES AND ACTIVITIES

Table 6A identifies significant BMPs that either have been or may be taken 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 305(b) and 303(d)	USEPA, Georgia DNR/EPD, Local/County Government	The congressional objective of the CWA “is to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” Section 305 (the <i>National Water Quality Inventory</i>) requires states to report progress in restoring impaired waters to EPA on a biennial basis. Section 303(d) requires states to identify ‘impaired’ waters, submit a list to EPA every two years, and develop TMDLs for these waters.	Federal, State	A	In place, on-going		
Georgia Water Quality Control Act (OCGA 12-5-20)	Georgia Rules and Regulations for Water Quality Control, Chapter	Law prohibiting discharge of excessive pollutants (sediments, nutrients, pesticides, animal wastes, etc.) into waters of the State in amounts harmful to public health, safety,	Federal, State, Local/County Governments	A	In place, on-going		

	391-3-6	<p>or welfare, or to animals, birds, or aquatic life or the physical destruction of stream habitats.</p> <p>Law authorizing Georgia EPD to control water pollution, eliminate phosphate detergents and regulate sludge disposal; to require permits for agricultural ground and surface water withdrawals; to prohibit siltation of state waters by land disturbing activities and require undisturbed buffers along state waters; to require land-use plans that include controls to protect drinking water supply sources and wetlands; to require river basin management plans on a rotation schedule for all major river basins.</p>					
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Plan for Beaverdam Creek
HUC 10 # 0306010304

Georgia Planning Act, Part 5	Local/County Government	Coordinated Planning Program, managed by Georgia DCA, requires local governments to identify Developments of Regional Impact (DRI) and develop plans to protect and manage Regional Impact Resources (RIR).	Local/County Governments Impact Fees	A	In place, on-going		Effectiveness varies with the specific BMPs applied.
Regulation of On-Site Sewage Management Systems, IAW O.C.G.A. 290-5-26	Georgia DHR, County Board of Health	Rules and regulations for installation and repair of on-site sewage management systems.	State, County Board of Health	A	In place, on-going	5	3 (in new development)
Sanitary Sewer Maintenance Program	City of Elberton	Sanitary sewer system inventory and inspection (mapping, television inspections); infiltration & inflow identification and reduction (flow monitoring, smoke testing); sewer line rehabilitation (pipe bursting, relining, cleaning) and manhole rehabilitation.	Local/County Water/	A	In place, on-going	3	5
Pet Waste Removal Ordinance	City of Elberton	Requires that animal owners remove pet waste from public property		A	2000	3	5
Georgia Planning Act, Part 5 - Water Quality Ordinances	City of Bowman	Coordinated Planning Program, managed by Georgia DCA, assigns local governments Environmental Planning Criteria (set by Georgia DNR) to include in local long-term comprehensive plans: Groundwater Recharge Ordinance, Wetlands Protection Ordinance, Wellhead Protection Ordinance		A, R	2000	.5	1
Water Quality Ordinances	City of Elberton	Soil Erosion and Sedimentation Control		A, R	2000	5	1 (for new or redevelopment)
Georgia Planning Act, Part 5 - Small Water Supply Watershed Protection Ordinance	City of Elberton, City of Bowman, Elbert County	Coordinated Planning Program, managed by Georgia DCA, assigns local governments Environmental Planning Criteria (set by Georgia DNR) to include in local long-term comprehensive plans: Increases buffer requirements and development and impervious surface restrictions within the watershed of the Beaverdam Creek water supply intake. Elberton lies within the 7-mile radius and Bowman lies outside the 7-mile radius.		A, R	1999	3	3 (for new and redevelopment)

Plan for Beaverdam Creek
HUC 10 # 0306010304

Georgia Planning Act, Part 5 - Large Water Supply Watershed Protection Ordinance	Elbert County	Coordinated Planning Program, managed by Georgia DCA, assigns local governments Environmental Planning Criteria (set by Georgia DNR) to include in local long-term comprehensive plans: Increases buffer requirements and development restriction within the Lake Russell water supply watershed.		A, R	2005	3	1 (for new and redevelopment)
Georgia Best Management Practices	Georgia Department of Agriculture / Georgia Environmental Protection Division for enforcement action.	Informs those involved in the agricultural business of effective practices to minimize non-point source pollution.	State	A	In place, on-going		Varies with BMP applied.
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.		R	In place, on-going	.5	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	R	In place, on-going		Effectiveness will vary with the specific application.
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 (Farm Bill 2002) 50% cost share with possible additional incentive payments	A	In place, on-going		Varies with BMP applied.

Plan for Beaverdam Creek
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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 of 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.				Effectiveness will vary with the specific application.
Rivers Alive Cleanup	US Army Corps of Engineers	Annual volunteer waterway cleanup to create awareness and involvement in the preservation of Georgia's water resources	GAEPD, GA DCA		In place, on-going		
Water Quality newspaper articles	County Extension	Extension agent has a column in the local paper. Periodically runs water quality articles related to agricultural BMPs, septic maintenance, etc.		P	2007 Ongoing	.5	.5
Targeted Sampling Volunteer Monitoring Event	Broad River Watershed Association, Adopt-A-Stream, EPD	Targeted sampling for E. coli using 3M petrifilm to determine priority sources of fecal coliform. Will be a publicized volunteer sampling event and public water quality education effort.	Section 106 Grant for TMDL implementation, Donations	A		.5	3
Follow-Up to Monitoring Event	Broad River Watershed Association, Adopt-A-Stream, EPD	Results from targeted sampling monitoring event will be presented to local officials and stakeholders to stimulate and guide their course of action. Data obtained from sampling would isolate the most likely sources of E. coli and help prioritize use of funding and resources.	Section 106 Grant for TMDL Implementation	NR	2008	5	3
				NE	2008	5	3

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 4). 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

SIGNIFICANT POTENTIAL SOURCES (1) (From Table 4)	IMPACT RATING (2) (From Table 4)	APPLICABLE BMPs (3) (From Table 6A)	EVALUATION SUMMARY (4)	ADDITIONAL INFORMATION / MEASURES NEEDED (5)
Wildlife	3	None	There is no reasonable assessment of the contributions of animal wastes from wild animals in wooded areas, waterfowl, or wild or domestic animals in or near stream corridors in urban or suburban areas. Management of wild animal wastes in wooded areas and urban stream corridors may not be feasible, but there are several management practices that may be applied to control waterfowl and domestic animal wastes.	Conduct a study to determine whether contributions of fecal coliform bacteria come from exclusively non-human sources (BST monitoring) or “natural conditions”. Should the study show that contributions from non-human sources occasionally exceed 200/100ml (geometric mean), submit data to EPD requesting a change in the fecal coliform standard to levels compliant with “natural conditions” for the segment.

				Should waterfowl be a significant contributor, consider measures to discourage waterfowl occupancy or manage populations.
Animal Production	3	Georgia Best Management Practices	Current management practices do not target farms that are in close proximity to the TMDL segment or those that are shown to have a direct impact on water quality.	Successful implementation of programs requires technical, assistance, education and marketing
		Georgia Rules and Regulations for Water Quality Control Chapter 391-3-6-.20 & . 21		
		Chapter 40-13-8 Animal Manure Handlers Rules of Georgia Department of Agriculture Animal Industry Division		
		Environmental Quality Incentives Program (EQIP)		
		Conservation Reserve Program (CRP)		
Septic Systems	1	Regulation of On-Site Sewage Management Systems, IAW O.C.G.A. 290-5-26	Effective enforcement of septic installation and permitting requirements will minimize future failures	If loads from septic systems are not being reduced, consider implementing a septic maintenance education program
		Water Quality Ordinances		
		Small Water Supply Watershed Protection Ordinance		
		Large Water Supply Watershed Protection Ordinance		
Sewer Line Leaks	1.5	Sanitary Sewer Maintenance Program	Currently sewer line and SSO maintenance occurs on an as needed basis.	If SSOs and sewer line leaks continue to occur, consider implementing sanitary sewer inspection and maintenance on a regular basis
Urban Runoff	1.5	Pet Waste Removal Ordinance	Implementing and enforcing water quality related ordinances that restrict use of impervious surfaces and increasing the riparian buffer width requirement within environmentally sensitive areas will reduce the amount of polluted runoff being input into streams.	Pollution from urban runoff would be reduced more if riparian buffer width requirements were increased for new development on all state waters.
		Water Quality Ordinances		
		Small Water Supply Watershed Protection Ordinance		
		Large Water Supply Watershed Protection Ordinance		

Illicit discharges/Illegal dumping	UNK			
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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.

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)

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

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)
Targeted Sampling Volunteer Monitoring Event “River Rendezvous”	Broad River Watershed Association, Adopt-A-Stream, EPD	Targeted sampling for E. coli using 3M petrifilm to determine priority sources of fecal coliform. Will be a publicized volunteer sampling event and public water quality education effort.	Section 106 Grant for TMDL implementation, Donations	NR	2008	5	3
Follow-Up to Monitoring Event	Broad River Watershed	Results from targeted sampling monitoring event will be presented to local officials and	Section 106 Grant for TMDL Implementation	NE	2008	5	3

	Association, Adopt-A-Stream, EPD	stakeholders to stimulate and guide their course of action. Data obtained from sampling would isolate the most likely sources of E. coli and help prioritize use of funding and resources.					
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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 [X].

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	
E. Coli	Broad River Watershed Association, Adopt-A-Stream, EPD	Recommended	2008	Ongoing	Determine priority sources through targeted sampling with Petrifilm (or IDEXX)

VIII. PLANNED OUTREACH FOR IMPLEMENTATION

Table 8 lists and describes outreach activities that will be conducted to support this implementation plan. (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

RESPONSIBILITY	DESCRIPTION	AUDIENCE	DATE
NEGRDC	Distribute TMDL Implementation plans to counties, cities and others participating in the implementation process.	Stakeholders	June 2007
NEGRDC	Presentation of potential implementation activities. Oconee River RC&D may apply for 319 grant funding in the future to implement suggested management practices mentioned in the meeting.	Oconee River RC&D	June 2007
Broad River Watershed Association, Adopt-A-Stream, EPD	Distribution of water quality education materials to volunteers helping with targeted sampling	Community Volunteers	2008

IX. MILESTONES AND MEASURES OF PROGRESS 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, 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.

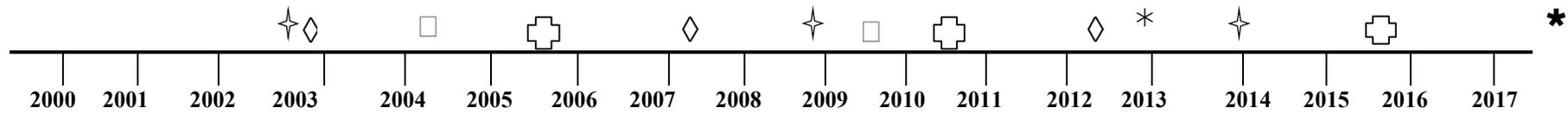
Table 9. MILESTONES AND MEASURES OF PROGRESS

BEST MANAGEMENT PRACTICE	RESPONSIBLE ORGANIZATION	STATUS		COMMENT
		PROPOSED	INSTALLED	
Georgia Best Management Practices	Georgia Department of Agriculture / Georgia Environmental Protection		On-going	Varies with BMP applied.

	Division for enforcement action.			
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.		On-going	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		On-going	Effectiveness will vary with the specific application.
Environmental Quality Incentives Program (EQIP)	Natural Resources Conservation Services		On-going	Varies with BMP applied. EQIP programs should be targeted to farms that are located near TMDL segments.
Conservation Reserve Program (CRP)	Natural Resources Conservation Services / USDA Farm Services Agency		On-going	Effectiveness will vary with the specific application.
Regulation of On-Site Sewage Management Systems, IAW O.C.G.A. 290-5-26	Georgia DHR, County Board of Health		On-going	Requires permitting of septic systems prior to installation and inspection after installation. Applies to all new septic systems. It has an effectiveness rating of 25-50%. Maintenance of systems is not enforced.
Water Quality Ordinances	Cities of Bowman and Elberton		2000, on-going	Restricts development within certain environmentally sensitive areas. These areas cover a small portion of the watershed. The ordinances are predicted to reduce impact of new development and have an effectiveness rating of 5-25%
Small Water Supply Watershed Protection Ordinance	Elbert County, City of Elberton, City of Bowman		1999 (Elberton)	Restricts impervious surfaces and increases buffer width requirements within water supply watersheds. Applies to new development in 20-50% of the watershed. Effectiveness rating of 25-75%.
Large Water Supply Watershed Protection Ordinance	Elbert County		2005	Restricts development within water supply watersheds. Applies to new development in 20-50% of the watershed. Effectiveness rating of 5-25%.
Sanitary Sewer Maintenance Program	Cities of Elberton and Bowman		On-going	Inspections conducted as needed. Overflows and leaks still occur occasionally. When repaired effectiveness is >75%.
Pet Waste Removal Ordinance	City of Elberton		2000	Pet waste must be removed from public property. Level of enforcement unknown. If disposed of properly the effectiveness should be >75%
Volunteer E. Coli Monitoring Event "River Rendezvous"	Broad River Watershed Association, Adopt-A-Stream, EPD	2008		Targeted sampling to determine sources with a water quality education initiative
Follow-Up to Monitoring Event	Broad River Watershed Association, Adopt-A-Stream, EPD	2008		Results from event presented to stakeholders and government officials and used to guide use of funding and resources.
Distribution of TMDL Implementation Plans	NEGRDC		June 2007	Hard copies to be distributed to requesting stakeholders. Plans to be posted on webpage.
Water Quality newspaper articles	County Extension		On-going	Periodically runs water quality articles related to agricultural BMPs, septic maintenance, etc.
Meeting with Oconee River RC&D Council	NEGRDC	June 2007		Presentation of potential future 319(h) projects to address sources of fecal coliform in the TMDL watersheds.

PROJECTED ATTAINMENT DATE

The projected date to attain and maintain water quality standards in this watershed is 10 years from acceptance 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:	6/15/2007	Revision:	01

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APPENDIX A.

STAKEHOLDERS

List the names, addresses, telephone numbers, and e-mail addresses for local governments, agricultural or commercial forestry organizations, significant landholders, businesses and industries, and local organizations, including environmental groups and individuals, with a major interest in this watershed.

NAME/ORGANIZATION	ADDRESS	CITY	STATE	ZIP	PHONE	E-MAIL
Bob Thomas, Elbert County Board of Commissioners	45 Forest Ave.	Elberton	GA	30635	706-283-20000	ecbocthomas@bellsouth.net
Byron Stovall, City of Elberton Water Department	234 N McIntosh St.	Elberton	GA	30635	706-213-3169	bstovall@cityofelberton.net
Cindy Churney, Clerk, City of Elberton	P.O. Box 70	Elberton	GA	30635	706-213-3100	cchurney@cityofelberton.net
Anna Grant Jones, Elbert County Development Authority	P.O. Box 63	Elberton	GA	30635	706-213-7600	ecdev@elberton.net
Katrina White, Natural Resource Conservation Service	333 Heard St.	Elberton	GA	30635	706-283-3021 ext. 3	Katrina.white@ga.usda.gov
Forrest Ferguson, Natural Resource Conservation Service	88 Maret St.	Hartwell	GA	30643	706-376-5451 ext. 3	Forrest.ferguson@ga.usda.gov
Jason Hackett, Fortson's Creek WPCP	234 N. McIntosh Street	Elberton	GA	30635	706-213-3162	
David Hudson, City of Elberton Utilities Department	234 N McIntosh St.	Elberton	GA	30635	706-213-3169	
David Spaid, Elbert County Extension Director	10 Cloverleaf Dr	Elberton	GA	30635	706-283-2037	dspaid@uga.edu
Allison Webb, Elbert County Health Department	618 Jones Street	Elberton	GA	30635	706-283-3775	amwebb@gdph.state.ga.us
Leland Bass, Elbert County Cattlemen's Association	2448 Corinth Church Rd.	Bowman	GA	30624	706-245-4334	
Phyllis H. Thompson, Elbert County Clerk	P.O. Box 6109	Elberton	GA	30635	706-283-2000	fleat@bellsouth.net

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.

APPENDIX C.

FIELD SURVEYS, NOTES, PHOTOGRAPHS, AND MAPS.

Visual Field Survey for Beaverdam Creek (Confluence N & S Beaverdam Creek to Savannah River), January 2007

Visual Field Survey
For
Beaverdam Creek
(Confluence N & S Beaverdam Creek to Savannah River)
In the
Savannah River Basin

January 2007

Prepared by the Northeast Georgia Regional Development Center with the support of the Environmental Protection Division of the Georgia Department of Natural Resources

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1.0 INTRODUCTION

1.1 Location

The Beaverdam Creek (confluence S & N Beaverdam Cr. to Savannah R.) TMDL segment is listed as not supporting its designated use of fishing due to excess fecal coliform bacteria. The data that put the segment on the 303(d) list were collected in 2002. The 22-mile segment is located in central Elbert County. The watershed is located in Elbert and Hart Counties; however, Hart County is not in the NEGRDC region, so this survey will cover only the Elbert County portion. The TMDL segment flows North of Elberton and into Richard B. Russell Lake. Portions of the cities of Elberton and Bowman are located within the watershed.

1.2 Watershed Description

The Beaverdam Creek TMDL segment watershed is comprised of 78,848.20 acres of land in Elbert and Hart Counties. The Elbert County portion is 47,587.03 acres. It is located within the HUC 10-0306010304, and is comprised of HUC 12-030601030401, 030601030402, and 030601030403. Land use was determined by classifying 2004 NEGRDC parcels data using the Land-Based Classification System of the American Planning Association. The primary land uses in the watershed are forestry/logging, residential and animal production. A large portion of the watershed is classified a park/recreation/conservation area as well. This is due to Lake Richard B. Russell being classified as such. The portion of the parcel for Lake Russell that is in the Beaverdam Creek watershed is 7,887.5 acres. **Table 1** shows the area and percent of each land use type. **Table 2** lists the LBCS categories and function codes that relate to each land use category used for this survey. The land use map for the Beaverdam Creek watershed is included as **Figure 1**. **Figure 2** shows the stream crossings that were surveyed and includes data obtained from EPD.

Table 1: Beaverdam Creek Watershed Land Use

	Area (Acres)	% of total
Residential	4584.7	10%
Commercial	2235.0	5%
Industrial	303.2	1%
Transportation/Communication/Utility	1590.5	3%
Park/Recreation/Conservation	7953.4	17%
Public/Institutional	492.4	1%
Mining/Extraction	733.5	2%
Crop Production	2709.3	6%
Animal Production	5265.0	11%
Forestry/Logging	22071.7	46%
Other	41.2	0%
Total	47980.0	100%

Table 2: LBCS Categories and Function Codes

Land Use Categories	LBCS Category	LBCS Function Codes
Residential	Private Household	1100
	Hotel, motel, other accommodation	1300
Commercial	General Sales and services	2000's
	Construction related business	7000's
Industrial	Manufacturing and Wholesale Trade	3000's
Transportation/Communication/Utility	Transportation, communication, information, and utility	4000's
Park/Recreation/Conservation	Arts, entertainment, and recreation	5000's
	Natural parks	5500
Public/Institutional	Education, public Admin., health care, oth. Institutional	6100
Mining/Extraction	Nonmetallic mining	8400
	Quarrying/stonecutting	8500
Crop Production	Crop Production	9100
	Support Functions for agriculture	9200
Animal Production	Animal production and slaughter, grazing land	9300
Forestry/Logging	Forestry and logging	9400
Game Preserve	Fishing, hunting and trapping, game preserves	9500
Other	Unclassifiable	9900

Figure1: Beaverdam Creek Land Use Map

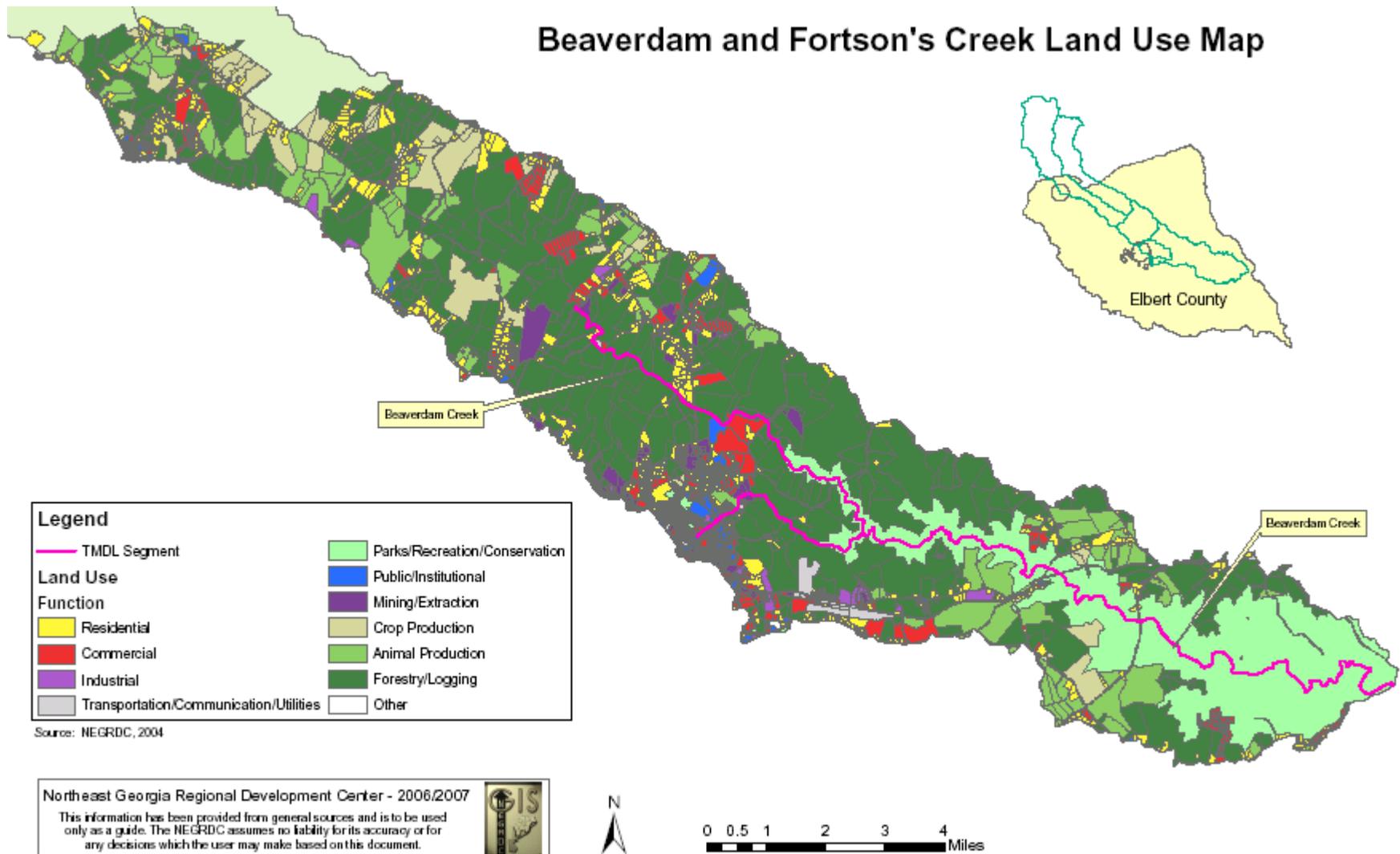
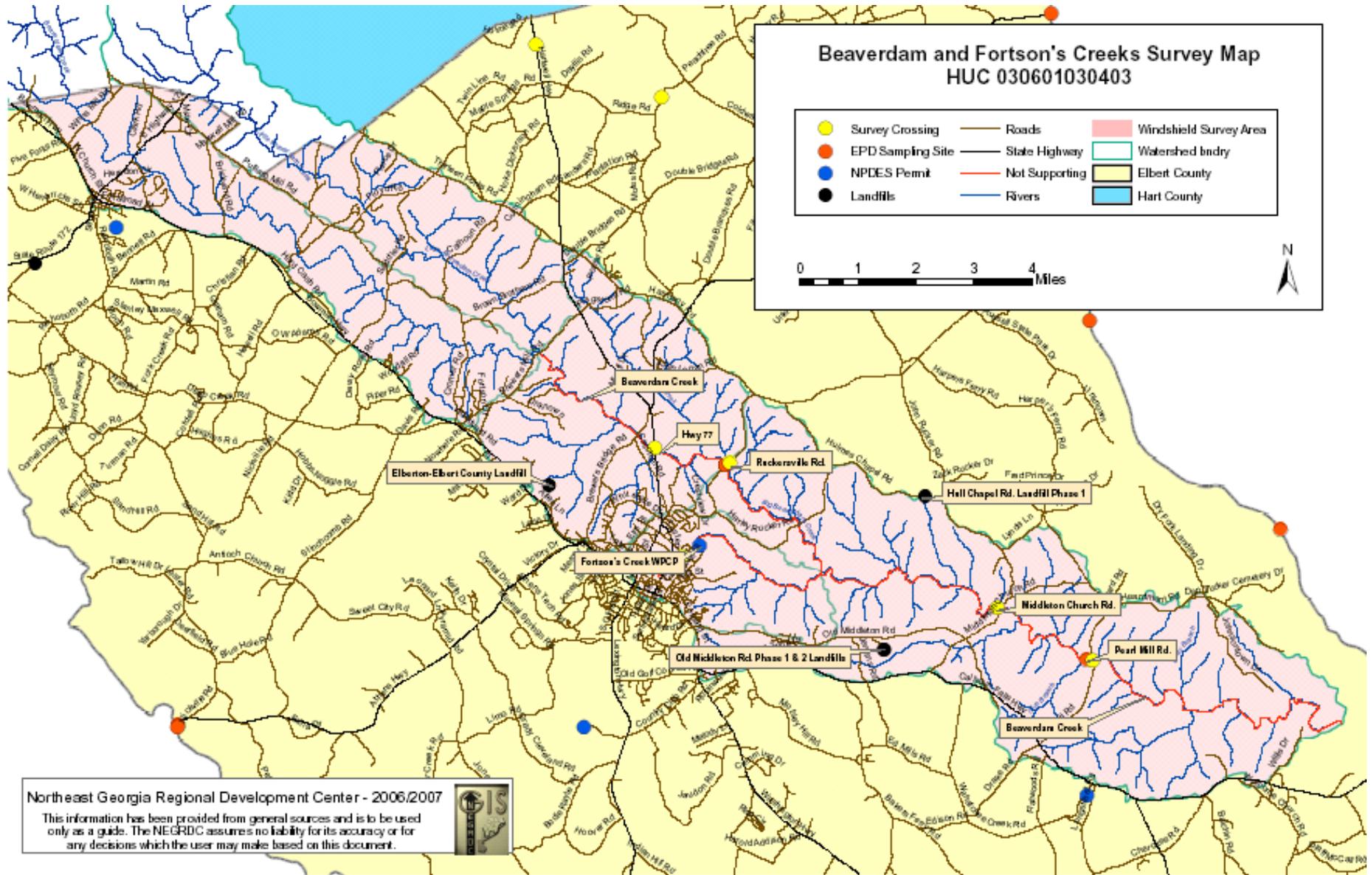


Figure 2: Beaverdam Creek Survey Map



2.0 METHODOLOGY

Prior to conducting the field survey, point data from the Georgia Environmental Protection Division were compiled and analyzed to determine the location of any point sources of pollution in the watershed. This data included the location of NPDES permitted facilities, landfills, LAS and CAFOs. In addition, 2005 aerial photos from the National Agricultural Imagery Program were used to determine possible sources of fecal coliform pollution within the watershed boundary that is shown on the maps on the previous pages. 2004 RDC land use data were also consulted to determine the extent of potential sources of fecal coliform. One purpose of the visual field surveys is to compare the most recent RDC land use data with the 1995 land use data that was used in the development of the TMDLs. However, in the case of the Beaverdam Creek segment watershed, the TMDL land use data included the portion of the watershed that is in Hart County, which is outside of the Northeast Georgia RDC region, so comparison was not possible.

The visual field survey consisted of a windshield survey of land use in the watershed and a visual assessment of stream condition at road crossings. The stream segment was not conducive to walking due to private property. Four road crossings were visited on the TMDL segment. The area of the windshield survey is shown on the survey map as the area shaded in pink. Sources investigated during the windshield survey were primarily animal production facilities, because these are easy to identify from aerials and it can be readily apparent if they are not using Best Management Practices. These facilities were considered to be priority sources if animals had access to the stream or there were not best management practices in place to prevent runoff of fecal matter into the stream. Notes and photographs were taken to document observations of the stream segment and the surrounding watershed.

3.0 FIELD FINDINGS

3.1 General Characteristics

The field findings discussed here are the result of the visual surveys of the TMDL stream segment and its watershed.

The four stream crossings visited during the field survey were at Pearl Mill Rd., Middleton Church Rd., Ruckersville Rd and Hwy 77. At all road crossings visited the water was reddish brown from sediment, there was bank erosion and sediment deposition on the stream banks and the riparian buffer was fairly wide and dense. At Ruckersville Rd. and Hwy 77 the water had a greenish tint. There were no unusual odors or water surface abnormalities. General photos of the stream are included as **Figures 3, 4, 5, 6 & 7.**



Figure 3. Beaverdam Creek/Lake Russell from Pearl Mill Rd.



Figure 4. Boat Ramp from Pearl Mill Rd



01/26/2007

Figure 5. Beaverdam Creek/Lake Russell from Boat Ramp at Middleton Church Rd.



01/26/2007

Figure 6. Beaverdam Creek at Ruckersville Rd. Looking Downstream



Figure 7. Beaverdam Creek at Hwy 77 Looking Downstream

Land use observed during the watershed drive included horse, cattle and poultry farms, cotton farming, forestry/logging, granite mining, rural residential and urban development.

3.2 Point Sources

There are two urbanized areas in the Beaverdam Creek watershed (Elberton and Bowman), which have sewer systems. Sewer line leaks could contribute to fecal coliform pollution. No sewer line leaks were witnessed during the survey, but there were two Sanitary Sewer Overflows (SSOs) in Elberton (one in 1995 and one in 2004) that may have impacted Beaverdam Creek. Illicit discharges to the storm water system are another potential source.

The only NPDES permitted facility in the watershed is the Fortson's Creek Water Pollution Control Plant. It discharges into Fortson's Creek, which is a tributary to Beaverdam Creek and is also a TMDL segment. The Fortson's Creek WPCP had two violations of its permit between July 1998 and June 2002. There have been several instances of spills and increased flows that have increased levels of fecal coliform in Fortson's Creek and may have impacted Beaverdam Creek.

3.3 Non-Point Sources

Potential non-point sources of fecal coliform in the Beaverdam Creek watershed include, agriculture, septic malfunction, landfills, wildlife, pet waste and leaking sanitary sewer system.

46% of the Beaverdam Creek watershed is classified as forestry/logging. The primary source of fecal coliform in forested areas is most likely wildlife; however, it is likely that there are human sources as well.

Next to forestry, animal production is the most common land use. During the watershed survey, we visited several farms to determine if there was in fact animal production at the site and to make observations of any activity that could contribute to fecal coliform loading, such as animal access to the stream. No such activities were observed; however, there was limited visibility from the road. GIS data shows that many farms in the watershed have tributaries flowing through their grazing fields; therefore, it is likely that there are some farms that are a significant source due to lack of proper Best Management Practices and proximity to streams.

Residential is the third most common land use in the Beaverdam Creek watershed. The majority of residences in the watershed are served by individual septic systems. The cities of Elberton and Bowman both have sanitary sewer lines, but these serve only a small portion of the watershed. It is likely that there are failing septic systems in the watershed, because there is no ordinance requiring maintenance. There is a requirement for permitting of septic systems upon installment. The permit requires a soil permeability analysis prior to installation to determine if it is suitable for septic; however, based on USDA soils data and the RDC's land use data there are about 350 homes that may have been built on soils that are not suitable for septic systems (unless major modifications are made to the system). The metadata for the USDA soils data used in the analysis states the following:

'Field investigations and data collection are carried out in sufficient detail to name map units and to identify accurately and consistently areas of about 4 acres.'

Storm water runoff is increased in urban areas due to impervious surfaces. Runoff can carry pet, human and wildlife waste to streams.

3.4 Other Potential Individual Sources

There are four landfills in the watershed, the Elberton-Elbert County Landfill, the Old Middleton Rd Phase 1 and 2 landfills, and the Hull Chapel Rd. landfill. The Old Middleton Rd and Hull Chapel Rd landfills are all closed and have permits. The Elberton-Elbert County landfill is inactive and has never been permitted.

4.0 RANKS ASSIGNED TO POLLUTION SOURCES

Wildlife is likely to be the primary source of fecal coliform in the Beaverdam Creek watershed due to the degree of forested area in the watershed. However, for the purposes of the implementation plans, animal production (including egg, poultry, livestock and horse operations) and failing septic systems will be considered priority sources.

5.0 SUMMARY OF FINDINGS

The primary land uses in the Beaverdam Creek watershed are forestry/logging, animal production and residential. The only point source is the Fortson's Creek wastewater treatment facility. Several possible non-point sources exist in the watershed including, animal production, failing septic systems, wildlife, sanitary sewer leaks, illicit discharges and landfills, although, not all sources were visibly evident.

6.0 STAKEHOLDER INVOLVEMENT

The field surveys were presented to stakeholders at the second advisory group meeting and posted on the Northeast Georgia RDC website to facilitate stakeholder input on the survey reports.