STATE OF GEORGIA

TMDL IMPLEMENTATION PLAN

SUWANNEE RIVER BASIN

STREAM APPROACH

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

This portion of the Implementation Plan addresses individual waterbodies and the corresponding pollutant sources, stakeholders, education/outreach activities, and potential funding resources. In addition, the Plan describes (a) regulatory and voluntary practices/control actions (*management measures*) to reduce target pollutants, (b) milestone schedules to show the development of the management measures (*measurable milestones*), and (c) a monitoring plan to determine the efficiency of the management measures and measurable milestones taken towards reducing pollutants in impaired waterbodies. The overall goal of the Plan is to define a set of actions that will help achieve water quality standards in the state of Georgia.

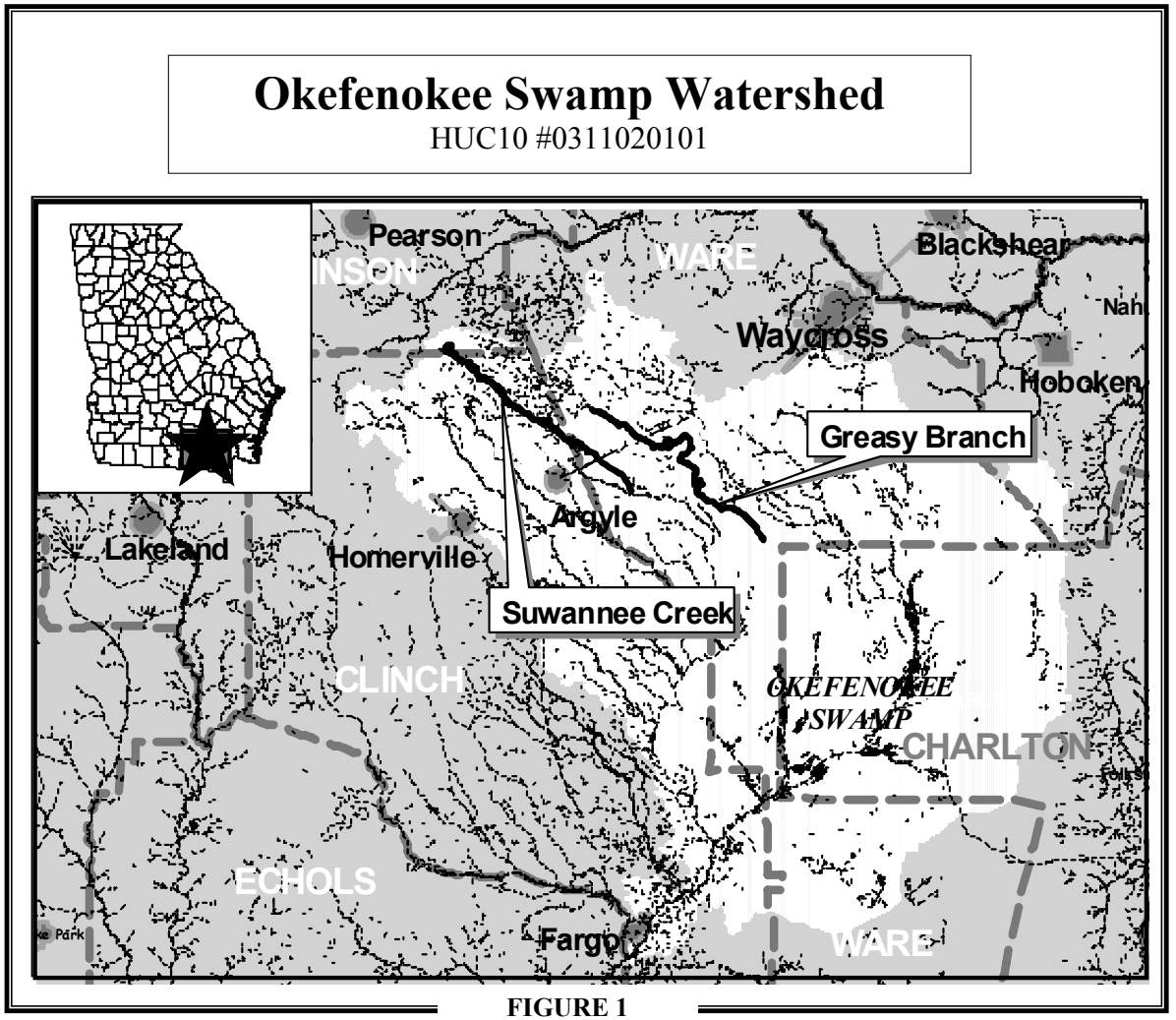

FIGURE 1

Impaired Waterbody*	Location	Impairment
1. Greasy Branch	U.S. Hwy 84/SR38 to Okefenokee Swamp	Dissolved Oxygen (DO)
2. Suwannee Creek	Headwaters to Little Suwannee Creek near Manor	Dissolved Oxygen (DO)

*These Waterbody Numbers are referenced throughout the implementation plan.

Satilla River Basin
TMDL Implementation Plan
Okefenokee Swamp Watershed
HUC10 #0311020101

1. Greasy Branch

NAME	LOCATION	MILES/AREA IMPACTED	USE CLASSIFICATION	PARTIALLY SUPPORTING/ NOT SUPPORTING (PS/NS)
Greasy Branch	U. S. Hwy84/SR38 to Okefenokee Swamp	10 miles	Fishing	NS
PRIMARY COUNTY	**SECONDARY COUNTY**	**SECOND RDC**		**SOURCE (POINT/NON-POINT)**
Ware				Nonpoint

POLLUTANTS	WATER QUALITY STANDARDS	REQUIRED LOAD REDUCTION	TMDL ID #	DATE TMDL ESTABLISHED
Contributing to DO	DO: 5 mg/L (daily)-4 mg/L (minimum) Natural Water Quality Standard DO: 2.114 mg/L (minimum)	Nonpoint: 7% TOC, TN, TP		December 2001

TOC=Total Organic Carbon (lb/yr), TN=Total Nitrogen (lb/yr), TP=Total Phosphorus (lb/yr)

SIGNIFICANT STAKEHOLDERS

Name/Organization	Address	City	State	Zip	Phone	E-mail
Raymond James, Mayor	N/A	Argyle	GA	31623	(912) 487-2270	N/A
John W. Strickland, Chairperson	100 Court Square	Homerville	GA	31634	(912) 487-2667	N/A
Wayne Kilmark, Waycross-Ware Planning Commission	902 Grove St.	Waycross	GA	31502	(912) 287-4379	jshubert@warecounty.com
Edwin Davis, Chairman, Atkinson County	P.O. Box 518	Pearson	GA	31642	(912) 422-3391	jjatco@planttel.net
Fredrick E. Carpenter Jr., Southeast Georgia RDC	1725 South Georgia Parkway, West	Waycross	GA	31502	(912) 285-6097	fecsegardc@accessatc.net
Bill Wikoff, International Paper	6508 New Jesup Highway	Brunswick	GA	31523	(912) 265-1378	Bill.wikoff@ipaper.co.
James Rouse, Rayonier	Rt.1 Box 19-B	Homerville	GA	31634	(912) 487-5912	jrouse@rayonier.com
Al Browning, River Keepers	P.O. Box 523	Nashville	GA	31702	(229) 686-2821	Labfarm1@yahoo.com
Bob Kenny, SMURFIT-Stone Container Corporation	Hwy 84E	Homerville	GA	31634	(912) 285-4087	bkenny@smurfit.com

EDUCATION/OUTREACH ACTIVITIES

Responsible Organization or Entity	Description	Target Audience	Anticipated Dates (MM/YY)
Southeast Georgia Regional Development Center, Fredrick E. Carpenter Jr.	Part V Ordinance/Regulation Review for the City of Argyle, Atkinson County, Clinch County, and Ware County	Local Government	02/2003
Coastal District EPD, Frank VanArsdale	Best Management Practices for Industry	Business Community	04/2004
Coastal District EPD, Frank VanArsdale	Best Management Practices for Water Quality	Business Community	04/2004
Georgia Forestry Commission, Stan Moore	Best Management Practices for Forestry	Forestry Industry	10/2002
NRCS, 7 Rivers RC&D, Luther Jones	Best Management Practices for Agricultural	Farming Community	06/2003
Save Our Satilla, Gloria Taylor	Satilla River Basin Environmental Group	Citizens	10/2002
Southeast Georgia Regional Development Center (RDC), DNR/EPD	Southeast Georgia RDC is assisting local governments with a Water Committee. The Committee has been operational for 9 months. One project that the committee would like to undertake is an educational videotape for Residential and Urban BMPs. The committee believes that the key to quality water is behavior modification through education. This will be collaborative effort between DNR/EPD, Southeast Georgia RDC, Water Committee and Local Governments.	Local Governments and Citizens	11/2003
Adopt-A-Stream	Will assist Al Browning in the introduction of the Adopt-A-Stream program into Atkinson County, Clinch County and Ware County. Mr. Al Browning is an Ecology teacher at Berrien County High School. He can be reached at (229) 686-7428.	Citizens	06/2003

Southeast Georgia Regional Development Center	Will assist local governments in seeking grants to delineate malfunctioning septic systems, lagoons and other wastewater systems.	Citizens and local governments	01/2003

POLLUTANT SOURCES

Pollutant	Source	Description of Contribution to Impairment
Dissolved Oxygen	Broadcasting of Organic Materials	Introduced into waterways by runoff and wind. Organic materials need aerobic microorganisms to further breakdown the materials lending to decreased oxygen in the impacted waterway.
Dissolved Oxygen	Rural Development	Unchecked runoff through stormwater sewers: (1) Discharges of sanitary waste and (2) Improper disposal of waste materials.
Dissolved Oxygen	Land Disturbing Activities	Unchecked runoff from developing/developed sites: (1) Discharges of sanitary waste, (2) Improper disposal of waste materials and (3) Introduction of sediments into waterways. (Sediments change the mechanics of the waterway by reducing flow rates).
Dissolved Oxygen	Spill/Discharge of Raw Sewage	Spillage and unauthorized discharges that are not properly contained and/or decontaminated correctly are left on surface(s) to be washed away during periods of precipitation or routine maintenance (washing) of manure spreading vehicles or other collection apparatuses or containers.
Dissolved Oxygen	Forested Woodlands and Terrain	Heavily forest and wetland often contribute to high organic (leaf litterfall, decomposing plants) loading and slow flows (due to minimum topographical relief) in a surface water system that result in conditions where the dissolved oxygen is naturally lower and cannot meet the numeric criteria without reductions in the natural nutrient and carbon loads. Usually reduction in natural forest or wetlands contributions is not feasible, practicable or desirable through conventional best management practices.
Dissolved Oxygen	Land Disturbing Activities: (1) Construction Sites, (2) Infrastructure Development and Maintenance	Uncheck runoff from construction sites: (1) Leaking portable waste containers, (2) Improperly disposed waste materials, and (3) Introduction of sediments into waterways. (Sediments change the mechanics of the waterway by reducing flow rate and increasing water temperatures)
Dissolved Oxygen	Laundry Care Products	Detergents are emptied into septic systems, onto surface, or deposited into unapproved drainage/septic systems. During periods of precipitation, these chemicals are washed into nearby drainage systems and/or waterways.
Dissolved Oxygen	Spill/Discharges of Raw Sewage	Spillage, unauthorized discharges, and cleansing of contaminated waste vehicles. These untreated materials are left on the surface to be introduced into the drainage system or waterway by precipitation or during the cleansing of equipment or collection apparatuses or containers.
Dissolved Oxygen	Improper Methods of Trash Collection and Disposal	Spillage and incorrect disposal techniques place substances on surfaces to be washed into waterway during precipitation.
Dissolved Oxygen	Collection and Disposal of Petroleum Products and Materials related to the repair of Gasoline and Diesel Equipment.	Fluids and materials associated with mechanical repairs and chemical absorbent materials that are not properly disposed of are left on surfaces to be washed into drainage system or waterways.

Dissolved Oxygen	Leaking Septic Systems	Effluent leakage due to overflowing sewage systems and leaking collection lines.
Dissolved Oxygen	Organic Materials From Lawns, City and County Right-of-Ways	Yard trimmings, leaves, branches and chipping materials that are not properly secured or disposed are washed away into nearby drainage systems and/or waterways.
Dissolved Oxygen	Automotive Product Care	Fluids, materials associated with auto repairs and chemical absorbent materials that are not properly disposed of are placed on surfaces to be washed into drainage system or dumped illegally into drainage systems.
Dissolved Oxygen	Organic Materials from Agricultural and Silvicultural Developments and Operations	Runoff from hay fields, row crop production, leaves, branches and chipping materials that are not properly secured or disposed are washed away into nearby drainage systems and/or waterways.
Dissolved Oxygen	Direct Leaf Litter	Direct introduction of leafs falling into waterways from overhanging branches, limbs and trees. These leaves settle at the bottom and require further breakdown by aerobic microorganisms.

MANAGEMENT MEASURES, RESPONSIBLE PARTIES, AND MEASURABLE MILESTONES

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Georgia Water Quality Control Act Georgia Groundwater Use Act Georgia Erosion & Sedimentation Act Georgia Comprehensive Planning Act Georgia River Basin Management Planning Act	Georgia DNR EPD	Laws 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.	11/1964	Enforced	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Ungoverned point source discharge and nonpoint source runoff pollution loads.	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Compliance with regulations to control water pollution including identification and implementation of Best Management Practices.	11/1964	Continuous	N/A

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
CAFO Regulations Land Application System Permits	Georgia DNR EPD General NPDES Permits	Permitting requirements for Concentrated Animal Feeding Operations and Land Application Systems with liquid manure	2002	Pending	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	lagoons, LAS sprays	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Compliance with regulations to control water pollution including identification and implementation of Best Management Practices	2002	Continuous	Comprehensive Nutrient Management Plan

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Domesticated and Commercial Animal/Livestock Excrement Disposal and Management Program	Individual	Encourages individuals to correctly dispose and manage excrement from animals/livestock operations.	2006	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Domesticated animals and Commercial Livestock Production	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants contributing to impaired DO in impacted waterways.	2006	Continuous	University of Georgia Extension Agent must provide educational opportunities if BMP is to become effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Herbicide and Pesticide Poison Care Disposal and Management Program	Individual	Encourages individuals to properly dispose of dangerous chemicals	2005	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Non-commercial and commercial application of Herbicides and Pesticides.	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in impacted waterways.	2005	Continuous	University of Georgia Extension Agent must provide educational opportunities if BMP is to become effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Stream Management Zones	Georgia Forestry Commission	Encourages Forest Production Operator to Plan and Implement strategies to prevent sediments, fluids and nutrients from entering waterway.	1993	In-Progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Fluids, excessive nutrients and organic materials	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in impacted waterways.	1993	Continuous	N/A

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Septic Tank Management Program	Southeast Georgia RDC, 7 Rivers RC&D and local governments in watershed.	319 grant to delineate failing septic systems	2004	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Effluent leakage from collection lines	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants contributing to impaired DO in impacted waterways.	2004	Continuous	Southeast Georgia RDC will work with 7 Rivers RC&D and local governments to apply for 319(h) grants to delineate and repair or replace malfunctioning septic systems.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary

Agricultural Best Management Practices (BMPs)	NRCS (7 Rivers RC&D) and University of Georgia Extension Service	Leads effort in agricultural water quality program, develops agricultural BMPs educational and monitoring efforts.	1987	In-Progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Animal facility runoff, pesticide/herbicide management, irrigation runoff management and manure applications.	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants contributing to impaired DO in impacted waterways.	1987	Continuous	NRCS and University of Georgia Extension Agent must provide continuous opportunities if BMP is to remain effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary

Nutrient Management Program	NRCS (7 Rivers RC&D) and University of Georgia Extension Service	Encourages and educates farmers on the correct usage and amount of fertilizers to maintain high yield and to lessen the impacts of nitrates and phosphates to waterways. Reduces NPS of pollution.	1991	In-Progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Natural and manmade fertilizers	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants contributing to impaired DO in impacted waterways.	1991	Continuous	NRCS and University of Georgia Extension Agent must provide continuous opportunities if BMP is to remain effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Forestry Best Management Practices (BMPs)	Georgia Forestry Commission	BMP categories include planning for water quality, SMZs, road location, construction, stream crossing and maintenance, timber harvesting, site preparation/reforestation and management/protection.	1999	In-progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Forestry	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in impacted waterways.	1999	Continuous	Georgia Forestry Commission must continuously provide education opportunities for foresters if BMPs are to remain effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary

Power Equipment, Commercial, Industrial, and Personal Product Care Disposal and Management Program	Individual	Encourages individuals to properly dispose of materials that are related to the repair and routine maintenance of power equipment.	2002	On-going	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Equipment cleansing, mechanical repairs and maintenance shops, and individual home auto maintenance and/or repair.	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO impacted waterways.	2002	Continuous	Local auto part houses encourage and provide opportunities for individual to dispose of fluids and materials that can't be disposed of by normal fluid or trash disposal methods.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
House Cleaner Disposal and Management Program	Individual	Encourages individuals to properly dispose of household chemicals	2005	Planned	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Household chemicals	Effective if program is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO impacted waterways.	2005	Continuous	Waste Disposal Company (Southland Waste Inc.) must encourage individuals to properly secure and dispose of household chemicals

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary

Sewer Management Program	Individual	Encourages individuals to routinely inspect sewage system on property.	12/2004	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Leaking Sewage Lines	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in the impacted waterways.	12/2004	Continuous	University of Georgia Extension Agent must provide educational opportunities if BMP is to become effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Spill/Discharge Control and Cleanup Program	Individual	Encourages individuals to cleanup or control and to report spills.	12/2004	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Surface Spills or Uncontrolled Discharges	Effective is BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in the impacted waterways.	12/2004	Continuous	University of Georgia Extension Agent must provide educational opportunities if BMP is to become effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary

BMP Monitoring	GFC	Within watershed will conduct monthly aerial BMP evaluations to identify recent forestry practices and conduct BMP audit	01/2003	Current	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Silviculture Activities	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in the impacted waterways.	01/2003	Continuous	N/A

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary

Storm Water Pollution Prevention Plan (SWPPP)	Southeast Georgia RDC, Coastal Conservation Resources, and NRCS	Storm water runoff is part of a natural hydrologic process. However, human activities, particularly urbanization and associated industrial activities, can alter natural drainage patterns and add pollutants to rivers, and streams. Impact is a decline in fish and restrictions on swimming.	01/2003	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Storm Water Run Off	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in the impacted waterways.	01/2003	Continuous	Southeast Georgia RDC will, with the assistance of Coastal Conservation Resources, and NRCS, seek funds to assist local governments in the development of Storm Water Pollution Prevention Plan (SWPPP).

POTENTIAL FUNDING SOURCES

Source	Responsible Authority	Status	Anticipated Funding Amount

Section 319 (h) of the Clean Water Act	EPA/State of Georgia	Must Apply	N/A
Small Business Technical Assistance Program	Georgia Department of Natural Resources (EPD)	Must Request Assistance	Undetermined-Free Technical Assistance
Environmental Quality Incentive Program (EQIP)	NRCS	Must Apply	N/A
Unified Watershed Assessment program	NRCS	Must Apply	N/A
Conservation Reserve Enhancement Plan	NRCS	Must Apply	N/A
Section 604(b) Grants	Georgia Department of Natural Resources	Must Apply	N/A

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MONITORING PLAN

Organization	Pollutants	Purpose/Description	Time Frame		Status: (Previous, Current, Proposed)
			Start	End	
GA EPD/USGS	DO	TMDL Evaluation/Monitoring Data	1998	1998	Previous
GA EPD	DO	Water Quality Testing	2003	2003	Proposed
GA EPD/USGS	DO	TMDL Evaluation	1998	1998	Previous
GFC	DO	BMP Monitoring	01/2003	Continuous	Current
GA DNR EPD	DO	Comprehensive Nutrient Management Plan	03/2002	03/2007	Current
Southeast Georgia RDC, NRCS and Coastal Conservation Resources	DO	Storm Water Pollution Prevention Plan	01/2003	01/2004	Proposed
Adopt-A-Stream	DO	Water Quality Testing	8/2003	Continuous	Proposed

COMMENTS: Suwannee Creek is dry at this time. This creek is much like other smaller streams in this region, dry in the summer, wet during late fall and early spring.

2. Suwannee Creek

NAME	LOCATION	MILES/AREA IMPACTED	USE CLASSIFICATION	PARTIALLY SUPPORTING/ NOT SUPPORTING (PS/NS)
Suwannee Creek	Headwaters to Little Suwannee Creek near Manor	16 miles	Fishing	NS
PRIMARY COUNTY	**SECONDARY COUNTY**	**SECOND RDC**		**SOURCE (POINT/NON-POINT)**
Clinch	Ware			Nonpoint

POLLUTANTS	WATER QUALITY STANDARDS	REQUIRED LOAD REDUCTION	TMDL ID #	DATE TMDL ESTABLISHED
Contributing to DO	DO: 5 mg/L (daily)-4 mg/L (minimum) Natural Water Quality Standard DO: 3.191 mg/L (minimum)	Nonpoint: 7% TOC, TN, TP		December 2001

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Bill Wikoff, International Paper	6508 New Jesup Highway	Brunswick	GA	31523	(912) 265-1378	Bill.wikoff@ipaper.co.
James Rouse, Rayonier	Rt.1 Box 19-B	Homerville	GA	31634	(912) 487-5912	jrouse@rayonier.com
Al Browning, River Keepers	P.O. Box 523	Nashville	GA	31702	(229) 686-2821	Labfarm1@yahoo.com
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Okefenokee Swamp Watershed
HUC10 #0311020101

MANAGEMENT MEASURES, RESPONSIBLE PARTIES, AND MEASURABLE MILESTONES

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Georgia Water Quality Control Act Georgia Groundwater Use Act Georgia Erosion & Sedimentation Act Georgia Comprehensive Planning Act Georgia River Basin Management Planning Act	Georgia DNR EPD	Laws 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.	11/1964	Enforced	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Ungoverned point source discharge and nonpoint source runoff pollution loads.	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Compliance with regulations to control water pollution including identification and implementation of Best Management Practices.	11/1964	Continuous	N/A

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
CAFO Regulations Land Application System Permits	Georgia DNR EPD General NPDES Permits	Permitting requirements for Concentrated Animal Feeding Operations and Land Application Systems with liquid manure	2002	Pending	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	lagoons, LAS sprays	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Compliance with regulations to control water pollution including identification and implementation of Best Management Practices	2002	Continuous	Comprehensive Nutrient Management Plan

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Domesticated and Commercial Animal/Livestock Excrement Disposal and Management Program	Individual	Encourages individuals to correctly dispose and manage excrement from animals/livestock operations.	2006	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Domesticated animals and Commercial Livestock Production	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants contributing to impaired DO in impacted waterways.	2006	Continuous	University of Georgia Extension Agent must provide educational opportunities if BMP is to become effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Herbicide and Pesticide Poison Care Disposal and Management Program	Individual	Encourages individuals to properly dispose of dangerous chemicals	2005	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Non-commercial and commercial application of Herbicides and Pesticides.	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in impacted waterways.	2005	Continuous	University of Georgia Extension Agent must provide educational opportunities if BMP is to become effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Stream Management Zones	Georgia Forestry Commission	Encourages Forest Production Operator to Plan and Implement strategies to prevent sediments, fluids and nutrients from entering waterway.	1993	In-Progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Fluids, excessive nutrients and organic materials	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in impacted waterways.	1993	Continuous	N/A

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Septic Tank Management Program	Southeast Georgia RDC, 7 Rivers RC&D and local governments in watershed.	319 grant to delineate failing septic systems	2004	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Effluent leakage from collection lines	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants contributing to impaired DO in impacted waterways.	2004	Continuous	Southeast Georgia RDC will work with 7 Rivers RC&D and local governments to apply for 319(h) grants to delineate and repair or replace malfunctioning septic systems.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Agricultural Best Management Practices (BMPs)	NRCS (7 Rivers RC&D) and University of Georgia Extension Service	Leads effort in agricultural water quality program, develops agricultural BMPs educational and monitoring efforts.	1987	In-Progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Animal facility runoff, pesticide/herbicide management, irrigation runoff management and manure applications.	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants contributing to impaired DO in impacted waterways.	1987	Continuous	NRCS and University of Georgia Extension Agent must provide continuous opportunities if BMP is to remain effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Nutrient Management Program	NRCS (7 Rivers RC&D) and University of Georgia Extension Service	Encourages and educates farmers on the correct usage and amount of fertilizers to maintain high yield and to lessen the impacts of nitrates and phosphates to waterways. Reduces NPS of pollution.	1991	In-Progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Natural and manmade fertilizers	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants contributing to impaired DO in impacted waterways.	1991	Continuous	NRCS and University of Georgia Extension Agent must provide continuous opportunities if BMP is to remain effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Forestry Best Management Practices (BMPs)	Georgia Forestry Commission	BMP categories include planning for water quality, SMZs, road location, construction, stream crossing and maintenance, timber harvesting, site preparation/reforestation and management/protection.	1999	In-progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Forestry	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in impacted waterways.	1999	Continuous	Georgia Forestry Commission must continuously provide education opportunities for foresters if BMPs are to remain effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Power Equipment, Commercial, Industrial, and Personal Product Care Disposal and Management Program	Individual	Encourages individuals to properly dispose of materials that are related to the repair and routine maintenance of power equipment.	2002	On-going	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Equipment cleansing, mechanical repairs and maintenance shops, and individual home auto maintenance and/or repair.	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO impacted waterways.	2002	Continuous	Local auto part houses encourage and provide opportunities for individual to dispose of fluids and materials that can't be disposed of by normal fluid or trash disposal methods.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
House Cleaner Disposal and Management Program	Individual	Encourages individuals to properly dispose of household chemicals	2005	Planned	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Household chemicals	Effective if program is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO impacted waterways.	2005	Continuous	Waste Disposal Company (Southland Waste Inc.) must encourage individuals to properly secure and dispose of household chemicals

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary

Sewer Management Program	Individual	Encourages individuals to routinely inspect sewage system on property.	12/2004	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Leaking Sewage Lines	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in the impacted waterways.	12/2004	Continuous	University of Georgia Extension Agent must provide educational opportunities if BMP is to become effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary
Spill/Discharge Control and Cleanup Program	Individual	Encourages individuals to cleanup or control and to report spills.	12/2004	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Surface Spills or Uncontrolled Discharges	Effective is BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in the impacted waterways.	12/2004	Continuous	University of Georgia Extension Agent must provide educational opportunities if BMP is to become effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary

BMP Monitoring	GFC	Within watershed will conduct monthly aerial BMP evaluations to identify recent forestry practices and conduct BMP audit	01/2003	Current	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Silviculture Activities	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in the impacted waterways.	01/2003	Continuous	N/A

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/Voluntary

Storm Water Pollution Prevention Plan (SWPPP)	Southeast Georgia RDC, Coastal Conservation Resources, and NRCS	Storm water runoff is part of a natural hydrologic process. However, human activities, particularly urbanization and associated industrial activities, can alter natural drainage patterns and add pollutants to rivers, and streams. Impact is a decline in fish and restrictions on swimming.	01/2003	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Anticipated or Past Effectiveness
DO	Storm Water Run Off	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in the impacted waterways.	01/2003	Continuous	Southeast Georgia RDC will, with the assistance of Coastal Conservation Resources, and NRCS, seek funds to assist local governments in the development of Storm Water Pollution Prevention Plan (SWPPP).

POTENTIAL FUNDING SOURCES

Source	Responsible Authority	Status	Anticipated Funding Amount
Section 319 (h) of the Clean Water Act	EPA/State of Georgia	Must Apply	N/A
Small Business Technical Assistance Program	Georgia Department of Natural Resources (EPD)	Must Request Assistance	Undetermined-Free Technical Assistance
Environmental Quality Incentive Program (EQIP)	NRCS	Must Apply	N/A
Unified Watershed Assessment program	NRCS	Must Apply	N/A
Conservation Reserve Enhancement Plan	NRCS	Must Apply	N/A
Section 604(b) Grants	Georgia Department of Natural Resources	Must Apply	N/A

MONITORING PLAN

Organization	Pollutants	Purpose/Description	Time Frame Start	Time Frame End	Status: (Previous, Current, Proposed)
GA EPD/USGS	DO	TMDL Evaluation/Monitoring Data	1998	1998	Previous
GA EPD	DO	Water Quality Testing	2003	2003	Proposed
GA EPD/USGS	DO	TMDL Evaluation	1998	1998	Previous
GFC	DO	BMP Monitoring	01/2003	Continuous	Current
GA DNR EPD	DO	Comprehensive Nutrient Management Plan	03/2002	03/2007	Current
Southeast Georgia RDC, NRCS and Coastal Conservation Resources	DO	Storm Water Pollution Prevention Plan	01/2003	01/2004	Proposed
Adopt-A-Stream	DO	Water Quality Testing	8/2003	Continuous	Proposed

COMMENTS:

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

STATE OF GEORGIA
TMDL IMPLEMENTATION PLAN
WATERSHED APPROACH

SUWANNEE RIVER BASIN

Local Watershed Governments
SOUTHEAST GEORGIA RDC
Clinch County
Ware County
Atkinson County
City of Argyle

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

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

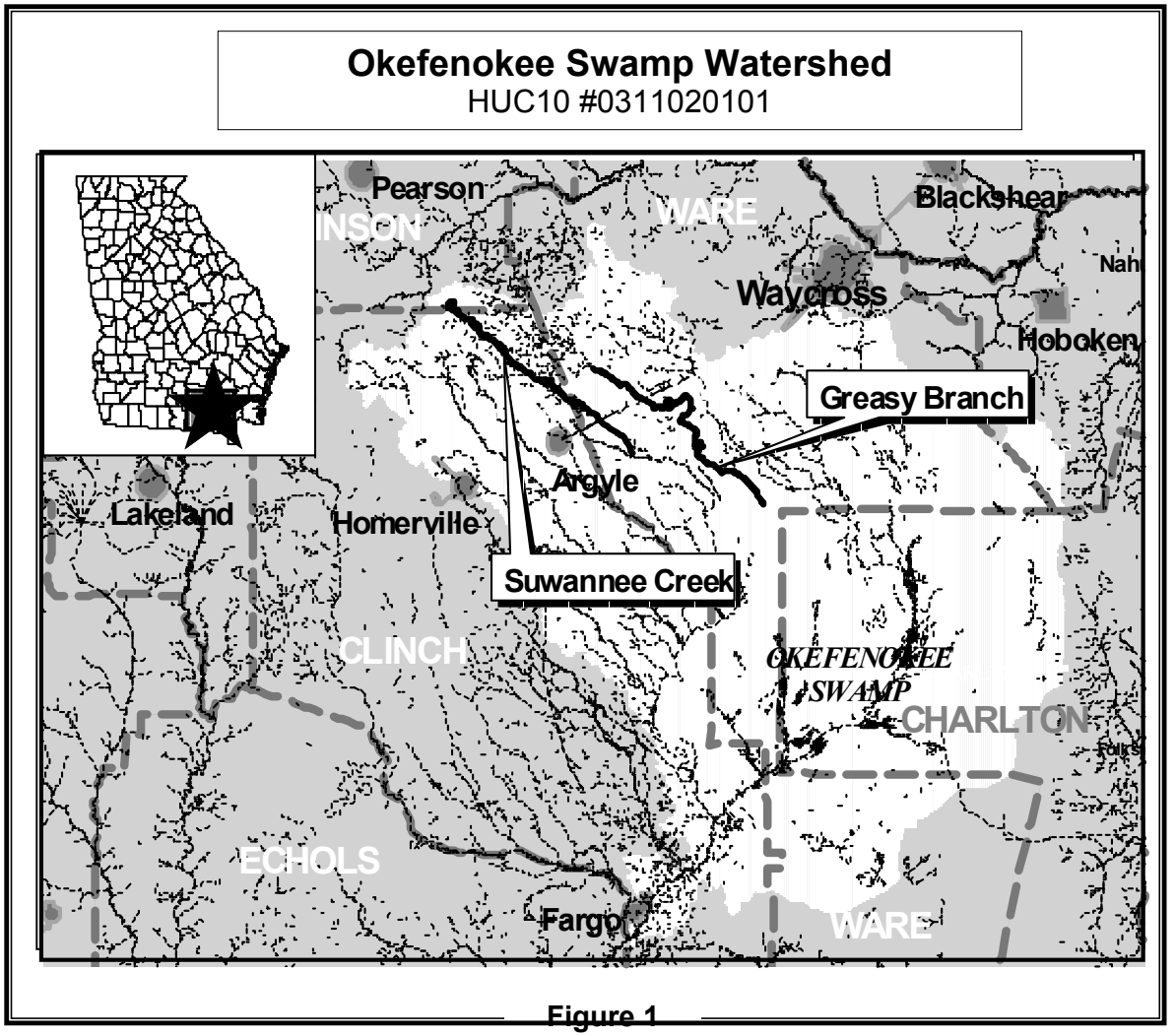

Figure 1

Impaired Waterbody*	Impaired Stream Location	Impairment
1. Greasy Branch	U.S. Hwy 84/SR38 to Okefenokee Swamp	Dissolved Oxygen (DO)
2. Suwannee Creek	Headwaters to Little Suwannee Creek near Manor	Dissolved Oxygen (DO)

*These Waterbody Numbers are referenced throughout the Implementation Plan.

Action Plan for Okefenokee Swamp Watershed

Watershed: Okefenokee Swamp
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POLLUTANT:	SOURCE:	EFFECT:	WHAT CAN I DO?	
			At Home: Community, School	At Work: Business, Government
X Dissolved Oxygen (DO) __ Fecal Coliform (FC) __ Sediment __ Metals __ Fish Consumption Guidelines (FCG) __ Other (Please List)	__ Industrial __ Urban X Agriculture X Forestry __ Residential X Other (Please List) Wetlands Heavy Forested Areas Terrain	X Habitat X Recreation X Drinking Water X Aesthetics __ Other (Please List)	**Septic Tank Management**: a. Prevent soil contamination. b. Prevent waste runoff. c. Routine and regular maintenance of septic system. **Pet Excrement Disposal**: a. Properly dispose of pet excrement. **Automotive Care**: a. Regular maintenance, check for leaks and the proper disposal of fluids at approved locations. **Lawn and Garden Care**: a. Proper yard maintenance. b. Proper disposal of organic and non-organic yard by products. c. Proper precautions and correct usage of chemical and fertilizers. **Household Cleaners:** a. Proper disposal of household chemicals. b. Correct usage of chemicals. **Sewer management:** a. Routine visual inspections and report leaks if noted. **Spill/Discharge Control and Cleanup:** a. Control and cleanup spills according to instruction of manufacture. **Miscellaneous Product Care:** a. Control and cleanup spills according to instruction of manufacture. **Trash Pickup**: a. Visually inspect containers and report damage or leaks b. Keep container secure at all times c. Ensure that trash is picked up on a regular schedule.	**Automotive Care**: a. Regular maintenance of fleet vehicles, check for leaks and the proper disposal of fluids at approved locations. **Lawn and Garden Care**: Ensure that contracted lawn services adhere to: a. Proper yard maintenance. b. Proper disposal of organic and non-organic yard by products. c. Proper precautions and correct usage of chemical and fertilizers. **Commercial Chemical Cleaners:** a. Proper disposal of commercial chemicals. b. Correct usage of chemicals. c. Inform all employees of MDSS. **Sewer management:** a. Routine visual inspections and report leaks if noted. **Spill/Discharge Control and Cleanup:** a. Control and cleanup spills according to instruction of manufacture. **Trash Pickup**: a. Visually inspect containers and report damage or leaks b. Keep container secure at all times c. Ensure that trash is picked up on a regular schedule. **Agriculture**: **Best Management Practices (BMPs)** a. Waste storage structure-Utilize and store waste b. Filter Strips-Reduce soil erosion, filter runoff and provide wildlife habitat. c. Nutrient Management-Prevent over-application of nutrients, protect against soil contamination. **Forestry**: **Best Management Practices (BMPs)** a. Streamside Management Zones (SMZS) b. Road building-Prevents soil erosion

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INFORMATION/EDUCATION/OUTREACH ACTIVITIES

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

Responsible Organization or Entity	Description	Impacted Waterbodies*	Target Audience	Anticipated Dates (MM/YY)
Southeast Georgia Regional Development Center, Fredrick E. Carpenter Jr.	Part V Ordinance/Regulation Review for the City of Argyle, Atkinson County, Clinch County, and Ware County	1, 2	Local Government	02/2003
Coastal District EPD, Frank VanArsdale	Best Management Practices for Industry	1, 2	Business Community	04/2004
Coastal District EPD, Frank VanArsdale	Best Management Practices for Water Quality	1, 2	Business Community	04/2004
Georgia Forestry Commission, Stan Moore	Best Management Practices for Forestry	1, 2	Forestry Industry	10/2002
NRCS, 7 Rivers RC&D, Luther Jones	Best Management Practices for Agricultural	1, 2	Farming Community	06/2003
Save Our Satilla, Gloria Taylor	Satilla River Basin Environmental Group	1, 2	Citizens	10/2002
Southeast Georgia Regional Development Center (RDC), DNR/EPD	Southeast Georgia RDC is assisting local governments with a Water Committee. The Committee has been operational for 9 months. One project that the committee would like to undertake is an educational videotape for Residential and Urban BMPs. The committee believes that the key to quality water is behavior modification through education. This will be collaborative effort between DNR/EPD, Southeast Georgia RDC, Water Committee and Local Governments.	1, 2	Local Governments and Citizens	11/2003
Adopt-A-Stream	Will assist Al Browning in the introduction of the Adopt-A-Stream program into Atkinson County, Clinch County and Ware County. Mr. Al Browning is an Ecology teacher at Berrien County High School. He can be reached at (229) 686-7428.	1, 2	Citizens	06/2003
Southeast Georgia Regional Development Center	Will assist local governments in seeking grants to delineate malfunctioning septic systems, lagoons and other wastewater systems.	1, 2	Citizens and local governments	01/2003

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STAKEHOLDERS

EPD encourages public involvement and the active participation of stakeholders in the process of improving water quality. Stakeholders can provide valuable information and data regarding their community and the impaired waterbodies and can provide insight and/or implement management measures.

List of local governments, agricultural organizations or significant landholders, commercial forestry organizations, 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
Raymond James, Mayor	N/A	Argyle	GA	31623	(912) 487-2270	N/A
John W. Strickland, Chairperson	100 Court Square	Homerville	GA	31634	(912) 487-2667	N/A
Wayne Kilmark, Waycross-Ware Planning Commission	902 Grove St.	Waycross	GA	31502	(912) 287-4379	jshubert@warecounty.com
Edwin Davis, Chairman, Atkinson County	P.O. Box 518	Pearson	GA	31642	(912) 422-3391	jjatco@planttel.net
Fredrick E. Carpenter Jr., Southeast Georgia RDC	1725 South Georgia Parkway, West	Waycross	GA	31502	(912) 285-6097	fecsegardc@accessatc.net
Bill Wikoff, International Paper	6508 New Jesup Highway	Brunswick	GA	31523	(912) 265-1378	Bill.wikoff@ipaper.co.
James Rouse, Rayonier	Rt.1 Box 19-B	Homerville	GA	31634	(912) 487-5912	jrouse@rayonier.com
Al Browning, River Keepers	P.O. Box 523	Nashville	GA	31702	(229) 686-2821	Labfarm1@yahoo.com
Bob Kenny, SMURFIT-Stone Container Corporation	Hwy 84E	Homerville	GA	31634	(912) 285-4087	bkenny@smurfit.com

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WATER BODIES/STREAMS COVERED IN THIS PLAN:

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

Waterbody Name #1	Location	Miles/Area Impacted	Use Classification	Partially Supporting/ Not Supporting (PS/NS)
Greasy Branch	U. S. Hwy84/SR38 to Okefenokee Swamp	10 miles	Fishing	NS

Primary County	Secondary County	Second RDC	Source (Point/ Nonpoint)
Ware			Nonpoint

Pollutants	Water Quality Standards	Required Load Reduction	TMDL ID	Date TMDL Established
Contributing to DO	DO: 5mg/Ldaily) - 4mg/L (minimum) Natural Water Quality Standard DO: 2.114 mg/L	7% TOC, TN, TP		December 2001

TOC=Total Organic Carbon (lb/yr), TN=Total Nitrogen (lb/yr), TP=Total Phosphorus (lb/yr)

Waterbody Name #2	Location	Miles/Area Impacted	Use Classification	Partially Supporting/ Not Supporting (PS/NS)
Suwannee Creek	Headwaters to Little Suwannee Creek near Manor	16 miles	Fishing	NS

Primary County	Secondary County	Second RDC	Source (Point/ Nonpoint)
Clinch	Ware		Nonpoint

Pollutants	Water Quality Standards	Required Reduction	TMDL ID	Date TMDL Established
Contributing to DO	DO: 5mg/L(daily) - 4mg/L(minimum) Natural Water Quality Standard DO: 3.191mg/L	7% TOC, TN, TP		December 2001

TOC=Total Organic Carbon (lb/yr), TN=Total Nitrogen (lb/yr), TP=Total Phosphorus (lb/yr)

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POLLUTANT SOURCES

It is important to recognize the potential source(s) causing water quality impairment. Each source must be controlled to comply with target TMDL/Load Allocations for each pollutant. Included is a description of how the sources contribute to the impairment and the waterbody that is impaired.

List of major nonpoint source categories and sub-categories or individual sources (Urban Runoff, Agriculture, Forestry, Municipal Sewage Treatment Plant)

Pollutant	Sources of Pollutants	Description of Contribution to Impairment	Impacted Waterbodies*
Dissolved Oxygen	Chemical/Fertilizer Applications, Silvicultural and Farming application of chemicals by aerial and broadcast means.	Residential Chemical/Fertilizer (Nitrates and Phosphates) runoff increases the natural eutrophication rates in streams and creeks, and contributes to impaired DO by producing a carbonaceous chemical reacting with O^2.	1, 2
Dissolved Oxygen	Organic Materials From Agricultural and Silvicultural Developments and Operations.	Runoff from hay fields, row crop production, leaves, branches and chipping materials that are not properly secured or disposed is washed away into nearby drainage systems and/or waterways.	1, 2
Dissolved Oxygen	Lateral Leaf Litter	Decrease in Oxygen due to decomposition of organic materials.	1, 2
Dissolved Oxygen	Wetlands	Wetland areas often contribute to high organic (leaf litterfall, decomposing plants) loading, slow flows (due to minimum topographical relief) and elevated temperatures in a surface water system that result in conditions where the dissolved oxygen is naturally lower and cannot meet the numeric criteria without reductions in the natural nutrient and carbon loads. Usually reduction in natural forest or wetlands contributions is not feasible, practicable or desirable through conventional best management practices.	1, 2
Dissolved Oxygen	Uncovered manure piles	Introduced into the waterway by the following methods: (1) Wind, and (2) runoff due to the introduction of water onto the pile. These nutrient enriched materials are then introduced into the waterway by the above means and aerobic microorganisms are needed to further breakdown the materials lending to decreased oxygen amounts in the waterway.	1, 2
Dissolved Oxygen	Access to waterways by livestock	Manure, feed and other materials are either transported on hooves, introduced into the stream by drinking livestock defecation, and/or feed is introduced into the waterway by runoff due to well traveled paths.	1, 2
Dissolved Oxygen	Manure from livestock operations	Runoffs from livestock feedlots are introduced into the waterway by rainfall or feedlot maintenance operations.	1, 2
Dissolved Oxygen	Sediments	Sediments slow the rate of flow and increase the temperature of the water, depleting the amount of available oxygen through mechanical alteration of the waterway.	1, 2

Pollutant	Sources of Pollutants	Description of Contribution to Impairment	Impacted Waterbodies*
Dissolved Oxygen	Direct Leaf Litter	Direct introduction of leafs falling into waterways from overhanging branches, limb and trees. These leaves settle at the bottom and require further breakdown by aerobic microorganisms.	1, 2
Dissolved Oxygen	Broadcasting of Organic Materials	Introduced into waterways by runoff and wind. Organic materials need aerobic microorganisms to further breakdown the materials lending to decreased oxygen in the impacted waterway.	1, 2
Dissolved Oxygen	Rural Development	Unchecked runoff through stormwater sewers: (1) Discharges of sanitary waste and (2) Improper disposal of waste materials.	1, 2
Dissolved Oxygen	Land Disturbing Activities	Unchecked runoff from developing/developed sites: (1) Discharges of sanitary waste, (2) Improper disposal of waste materials and (3) Introduction of sediments into waterways. (Sediments change the mechanics of the waterway by reducing flow rates).	1, 2
Dissolved Oxygen	Spill/Discharge of Raw Sewage	Spillage and unauthorized discharges that are not properly contained and/or decontaminated correctly are left on surface(s) to be washed away during periods of precipitation or routine maintenance (washing) of manure spreading vehicles or other collection apparatuses or containers.	1, 2
Dissolved Oxygen	Forested Woodlands and Terrain	Heavily forest and wetland often contribute to high organic (leaf litterfall, decomposing plants) loading and slow flows (due to minimum topographical relief) in a surface water system that result in conditions where the dissolved oxygen is naturally lower and cannot meet the numeric criteria without reductions in the natural nutrient and carbon loads. Usually reduction in natural forest or wetlands contributions is not feasible, practicable or desirable through conventional best management practices.	1, 2
Dissolved Oxygen	Land Disturbing Activities: (1) Construction Sites, (2) Infrastructure Development and Maintenance	Uncheck runoff from construction sites: (1) Leaking portable waste containers, (2) Improperly disposed waste materials, and (3) Introduction of sediments into waterways. (Sediments change the mechanics of the waterway by reducing flow rate and increasing water temperatures)	1, 2
Dissolved Oxygen	Laundry Care Products	Detergents are emptied into septic systems, onto surface, or deposited into unapproved drainage/septic systems. During periods of precipitation, these chemicals are washed into nearby drainage systems and/or waterways.	1, 2
Dissolved Oxygen	Spill/Discharges of Raw Sewage	Spillage, unauthorized discharges, and cleansing of contaminated waste vehicles. These untreated materials are left on the surface to be introduced into the drainage system or waterway by precipitation or during the cleansing of equipment or collection apparatuses or containers.	1, 2
Dissolved Oxygen	Improper Methods of Trash Collection and Disposal	Spillage and incorrect disposal techniques place substances on surfaces to be washed into waterway during precipitation.	1, 2

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Pollutant	Sources of Pollutants	Description of Contribution to Impairment	Impacted Waterbodies*
Dissolved Oxygen	Collection and Disposal of Petroleum Products and Materials related to the repair of Gasoline and Diesel Equipment.	Fluids and materials associated with mechanical repairs and chemical absorbent materials that are not properly disposed of are left on surfaces to be washed into drainage system or waterways.	1, 2
Dissolved Oxygen	Leaking Septic Systems	Effluent leakage due to overflowing sewage systems and leaking collection lines.	1, 2
Dissolved Oxygen	Organic Materials From Lawns, City and County Right-of-Ways	Yard trimmings, leaves, branches and chipping materials that are not properly secured or disposed are washed away into nearby drainage systems and/or waterways.	1, 2
Dissolved Oxygen	Automotive Product Care	Fluids, materials associated with auto repairs and chemical absorbent materials that are not properly disposed of are placed on surfaces to be washed into drainage system or dumped illegally into drainage systems.	1, 2
Dissolved Oxygen	Organic Materials from Agricultural and Silvicultural Developments and Operations	Runoff from hay fields, row crop production, leaves, branches and chipping materials that are not properly secured or disposed are washed away into nearby drainage systems and/or waterways.	1, 2
Dissolved Oxygen	Direct Leaf Litter	Direct introduction of leafs falling into waterways from overhanging branches, limbs and trees. These leaves settle at the bottom and require further breakdown by aerobic microorganisms.	1, 2

Watershed: Okefenokee Swamp
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MANAGEMENT MEASURES, MEASURABLE MILESTONES AND SCHEDULE

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

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

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Georgia Water Quality Control Act Georgia Groundwater Use Act Georgia Erosion & Sedimentation Act Georgia Comprehensive Planning Act Georgia River Basin Management Planning Act	Georgia DNR EPD	Laws 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.	11/1964	Enforced	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	Ungoverned point source discharge and nonpoint source runoff pollution loads.	1, 2	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Compliance with regulations to control water pollution including identification and implementation of Best Management Practices.	11/1964	Continuous	N/A

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
CAFO Regulations Land Application System Permits	Georgia DNR EPD General NPDES Permits	Permitting requirements for Concentrated Animal Feeding Operations and Land Application Systems with liquid manure	2002	Pending	Regulatory

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	lagoons, LAS sprays	1, 2	Effective

Measurable Milestones	Schedule Start	Schedule End	Comments
Compliance with regulations to control water pollution including identification and implementation of Best Management Practices	2002	Continuous	Comprehensive Nutrient Management Plan

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Domesticated and Commercial Animal/Livestock Excrement Disposal and Management Program	Individual	Encourages individuals to correctly dispose and manage excrement from animals/livestock operations.	2006	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	Domesticated animals and Commercial Livestock Production	1, 2	Effective if BMP is implemented

Measurable Milestones	Schedule Start	Schedule End	Comments
Reduction in the measurable amount of pollutants contributing to impaired DO in impacted waterways.	2006	Continuous	University of Georgia Extension Agent must provide educational opportunities if BMP is to become effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Herbicide and Pesticide Poison Care Disposal and Management Program	Individual	Encourages individuals to properly dispose of dangerous chemicals	2005	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	Non-commercial and commercial application of Herbicides and Pesticides.	1, 2	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in impacted waterways.	2005	Continuous	University of Georgia Extension Agent must provide educational opportunities if BMP is to become effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Stream Management Zones	Georgia Forestry Commission	Encourages Forest Production Operator to Plan and Implement strategies to prevent sediments, fluids and nutrients from entering waterway.	1993	In-Progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	Fluids, excessive nutrients and organic materials	1, 2	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in impacted waterways.	1993	Continuous	N/A

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Septic Tank Management Program	Southeast Georgia RDC, 7 Rivers RC&D and local governments in watershed.	319 grant to delineate failing septic systems	2004	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	Effluent leakage from collection lines	1, 2	Effective if BMP is implemented

Measurable Milestones	Schedule Start	Schedule End	Comments
Reduction in the measurable amount of pollutants contributing to impaired DO in impacted waterways.	2004	Continuous	Southeast Georgia RDC will work with 7 Rivers RC&D and local governments to apply for 319(h) grants to delineate and repair or replace malfunctioning septic systems.

Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Agricultural Best Management Practices (BMPs)	NRCS (7 Rivers RC&D) and University of Georgia Extension Service	Leads effort in agricultural water quality program, develops agricultural BMPs educational and monitoring efforts.	1987	In-Progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Waterbodies* Impacted	Anticipated or Past Effectiveness
DO	Animal facility runoff, pesticide/herbicide management, irrigation runoff management and manure applications.	1, 2	Effective

Measurable Milestones	Schedule Start	Schedule End	Comments
Reduction in the measurable amount of pollutants contributing to impaired DO in impacted waterways.	1987	Continuous	NRCS and University of Georgia Extension Agent must provide continuous opportunities if BMP is to remain effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Nutrient Management Program	NRCS (7 Rivers RC&D) and University of Georgia Extension Service	Encourages and educates farmers on the correct usage and amount of fertilizers to maintain high yield and to lessen the impacts of nitrates and phosphates to waterways. Reduces NPS of pollution.	1991	In-Progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Waterbodies* Impacted	Anticipated or Past Effectiveness
DO	Natural and manmade fertilizers	1, 2	Effective

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants contributing to impaired DO in impacted waterways.	1991	Continuous	NRCS and University of Georgia Extension Agent must provide continuous opportunities if BMP is to remain effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Forestry Best Management Practices (BMPs)	Georgia Forestry Commission	BMP categories include planning for water quality, SMZs, road location, construction, stream crossing and maintenance, timber harvesting, site preparation/reforestation and management/protection.	1999	In-progress	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	Forestry	1, 2	Effective

Measurable Milestones	Schedule: Start	Schedule: End	Comments
Reduction in the measurable amount of pollutants that contribute to impaired DO in impacted waterways.	1999	Continuous	Georgia Forestry Commission must continuously provide education opportunities for foresters if BMPs are to remain effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Power Equipment, Commercial, Industrial, and Personal Product Care Disposal and Management Program	Individual	Encourages individuals to properly dispose of materials that are related to the repair and routine maintenance of power equipment.	2002	On-going	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	Equipment cleansing, mechanical repairs and maintenance shops, and individual home auto maintenance and/or repair.	1, 2	Effective

Measurable Milestones	Schedule: Start	Schedule: End	Comments
Reduction in the measurable amount of pollutants that contribute to impaired DO impacted waterways.	2002	Continuous	Local auto part houses encourage and provide opportunities for individual to dispose of fluids and materials that can't be disposed of by normal fluid or trash disposal methods.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
House Cleaner Disposal and Management Program	Individual	Encourages individuals to properly dispose of household chemicals	2005	Planned	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	Household chemicals	1, 2	Effective if program is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO impacted waterways.	2005	Continuous	Waste Disposal Company (Southland Waste Inc.) must encourage individuals to properly secure and dispose of household chemicals

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Sewer Management Program	Individual	Encourages individuals to routinely inspect sewage system on property.	12/2004	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	Leaking Sewage Lines	1, 2	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in the impacted waterways.	12/2004	Continuous	University of Georgia Extension Agent must provide educational opportunities if BMP is to become effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Spill/Discharge Control and Cleanup Program	Individual	Encourages individuals to cleanup or control and to report spills.	12/2004	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	Surface Spills or Uncontrolled Discharges	1, 2	Effective is BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in the impacted waterways.	12/2004	Continuous	University of Georgia Extension Agent must provide educational opportunities if BMP is to become effective.

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
BMP Monitoring	GFC	Within watershed will conduct monthly aerial BMP evaluations to identify recent forestry practices and conduct BMP audit	01/2003	Current	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	Silviculture Activities	1, 2	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in the impacted waterways.	01/2003	Continuous	N/A

Watershed: Okefenokee Swamp
HUC10: #0311020101

Regulation/Ordinance or Management Measure	Responsible Government, Organization or Entity	Description	Enacted/ Projected Date	Status	Regulatory/ Voluntary
Storm Water Pollution Prevention Plan (SWPPP)	Southeast Georgia RDC, Coastal Conservation Resources, and NRCS	Storm water runoff is part of a natural hydrologic process. However, human activities, particularly urbanization and associated industrial activities, can alter natural drainage patterns and add pollutants to rivers, and streams. Impact is a decline in fish and restrictions on swimming.	01/2003	Planning	Voluntary

Pollutant(s) Affected	Sources of Pollutant(s)	Impacted Waterbodies*	Anticipated or Past Effectiveness
DO	Storm Water Run Off	1, 2	Effective if BMP is implemented

Measurable Milestones	Schedule		Comments
	Start	End	
Reduction in the measurable amount of pollutants that contribute to impaired DO in the impacted waterways.	01/2003	Continuous	Southeast Georgia RDC will, with the assistance of Coastal Conservation Resources, and NRCS, seek funds to assist local governments in the development of Storm Water Pollution Prevention Plan (SWPPP).

POTENTIAL FUNDING SOURCES

The identification and discussion of dedicated funding is important in determining the economic feasibility of the above-mentioned management measures.

Funding Source	Responsible Authority	Status	Anticipated Funding Amount	Impacted Waterbodies*
Section 319 (h) of the Clean Water Act	EPA/State of Georgia	Must Apply	N/A	1, 2
Small Business Technical Assistance Program	Georgia Department of Natural Resources (EPD)	Must Request Assistance	Undetermined-Free Technical Assistance	1, 2
Environmental Quality Incentive Program (EQIP)	NRCS	Must Apply	N/A	1, 2
Unified Watershed Assessment program	NRCS	Must Apply	N/A	1, 2
Conservation Reserve Enhancement Plan	NRCS	Must Apply	N/A	1, 2
Section 604(b) Grants	Georgia Department of Natural Resources	Must Apply	N/A	1, 2

PROJECTED ATTAINMENT DATE

Watershed: Okefenokee Swamp
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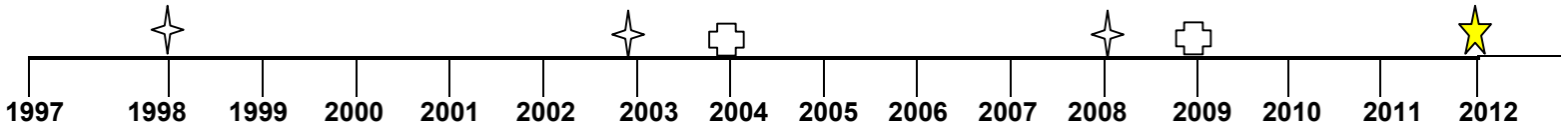
The projected date to attain and maintain water quality standards in this watershed is 10 years from acceptance of the TMDL Implementation Plan by EPD.



EPD Monitoring
Evaluate TMDL & Attainment Date
Project Attainment

Watershed: Okefenokee Swamp
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MONITORING PLAN

The purpose of this monitoring plan is to determine the effectiveness of the target TMDL and the management measures being implemented to meet water quality standards. List of previous, current or planned /proposed sampling activities or other surveys. Monitoring data that placed stream on 303(d) list will be provided if requested.

Name of Regulation/Ordinance or Management Measure	Organization	Impacted Waterbodies*	Pollutants	Purpose/Description	Time Frame		Status (Previous, Current, Proposed)
					Start	End	
TMDL Evaluation/Monitoring Data	GA EPD/USGS	1, 2	DO	TMDL Evaluation /Monitoring data for Georgia 305(b)/303(d) List	1998	1998	Previous
Water Quality Testing	GA EPD	1, 2	DO	Water Quality Testing/Assessment of water quality.	2003	2003	Proposed
TMDL Evaluation	GA EPD/USGS	1, 2	DO	Monitoring data for GA 305(b)/303(d) list	1998	1998	Previous
BMP Monitoring	GFC	1, 2	DO	Within watershed will conduct monthly aerial BMP evaluations to identify recent forestry practices and conduct BMP.	01/2003	Continuous	Current
Comprehensive Nutrient Management Plan	GA DNR EPD	1, 2	DO	Component of general CAFO/LAS permits to identify and describe practices that are to be implemented to assure compliance with the limitations and conditions of the permit.	03/2002	03/2007	Current
Storm Water Pollution Prevention Plan	Southeast Georgia RDC, NRCS and Coastal Conservation Resources	1, 2	DO	Southeast Georgia RDC will, with the assistance of Coastal Conservation Resources and NRCS, seek funds to assist local governments in the development of Storm Water Pollution Prevention Plan (SWPPP).	01/2003	01/2004	Proposed
Water Quality Testing	Adopt-A-Stream	1, 2	DO	Water Quality Testing/Assessment of water quality.	8/2003	Continuous	Proposed

Watershed: Okefenokee Swamp
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CRITERIA TO DETERMINE WHETHER SUBSTANTIAL PROGRESS IS BEING MADE

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

- Percent of concentration or load change (monitoring program)

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

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

- Regulatory controls or activities installed (ordinances, laws)

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

COMMENTS

Suwannee Creek is dry at this time. This creek is much like other smaller streams in this region, dry in the summer, wet during late fall and early spring.

Watershed: Okefenokee Swamp
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Environmental Protection Division of the Department of Natural Resources, State of Georgia.

TOGETHER WE CAN MAKE A DIFFERENCE!

Watershed: Okefenokee Swamp
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Department Use Only:

Implementation Plan	Impaired Waterbodies			
	1	2	3	4
Action Plans				
Education/Outreach Activities				
Stakeholders				
Pollutant Sources Identified				
Description of Management Measures				
Measurable Milestones and Schedule				
Potential Funding Sources				
Monitoring Plan				
Criteria To Determine Whether Substantial Progress Is Being Made				
Supporting Documents				