STATE OF GEORGIA
TMDL IMPLEMENTATION PLAN
FECAL COLIFORM PARAMETER
FOR FISH POND DRAIN, SEMINOLE COUNTY, GEORGIA

Background

Fish Pond Drain in Seminole County, Georgia has a beneficial water use classification of fishing and is currently listed as an impaired water body. The degree of impairment is classified as not supporting use and the TMDL for Fish Pond Drain is set at a target level of 175 cfu/100 ml of water, a level that will allow the water body to achieve water quality standards necessary for the beneficial use classification of fishing.

The target levels are the fecal coliform levels established in Georgia's Water Quality Standards, as listed in Georgia Rules and Regulations for Water Quality, November 1996. The criterion for fecal coliform bacteria from May through October is a 30-day geometric mean of 200 mpn/100ml and from November through April a 30-day geometric mean of 1,000 mpn/100 ml with a maximum of 4,000 mpn/100 ml. Note mpn is defined as most probable number and is equivalent to cfu.

A Total Maximum Daily Load (TMDL) is a calculation of the maximum amount of a pollutant, from both point and non-point sources, that a waterbody can receive and still meet water quality standards. The Clean Water Act, section 303, establishes the water quality standards and the TMDL programs. TMDLs are simply the implementation of rules included in Section 303(d) of the Clean Water Act of 1972. The resulting inventory of impaired streams and water bodies – called the 303(d) list – provides a basis for decisions related to restoring water quality. Although some TMDLs are aimed at managing all sources of pollution which affect beneficial uses of water, the focus of the implementation plan discussed here relates primarily to nonpoint sources of fecal coliform, including contamination from diffuse sources such as agricultural and urban runoff.

Methods of measuring pathogens directly are costly and time-consuming. In most cases, indicator organisms are used instead of analyzing the pathogens themselves. These indicator organisms are bacteria that also occur in human and animal waste, but generally are not pathogens themselves. In contrast to pathogens, the coliforms are easy to collect and count, and often provide at least an indication of whether or not fecal matter has entered the water body. The downside of using indicator organisms, like coliforms, is that coliform tests are generally nonspecific; they do not distinguish between human and other animal coliform. However, at present, this is our best source of indication. Loads are expressed in terms of cells per 100 ml of water.

The purpose of this plan is to recommend activities to reduce fecal coliform levels flowing into Fish Pond Drain. See the attached Fish Pond Drain Study Area map which outlines the Fish Pond Drain drainage basin.

Existing TMDL and Monitoring Data

Few sources of data are available to determine levels of fecal coliform (FC) present in Fish Pond Drain. The monitoring data listed in the TMDL determination document include four sample-collection dates during April through July 1995. These data were collected or analyzed by Environmental Protection Division, Georgia Department of Natural Resources or U.S. Geological Survey, Florida District.

The model was developed under the assumption that baseflow contamination is the major cause of impairment of Fishpond Drain. This assumption was made considering that instream measurements as high as 240,000 cfu/100 ml is likely not attributable to runoff. In addition, this measurement is two orders of magnitude greater than any other sample taken at this site. It is recommended that the

watershed should be studied further to determine the source(s) of the high baseflow concentrations and whether exceedences of the fecal coliform water quality standards may be attributable to runoff.

Levels of FC from the four samples range from a low of 70 mpn/100 ml on April 20, 1995 to a high of >240,000mpn/100 ml on June 21, 1995. This spike in FC count is may be attributed to a significant rainfall event. This assumption is supported by correlation of estimated discharge rate to FC counts. The estimated discharge rate on May 17 is 0.1 ft^3/ sec. compared to June 21 rate of 1.1 ft^3/ sec., two orders of magnitude greater than any other sample taken at this site. Turbidity measurements indicate a sharp increase for the July 21 date, as well. Sample turbidity for April 20 was 9.0 ntu, followed by May 17 at 87 ntu and June 21 at 190 ntu.

More data are needed to identify sources of nonpoint source pollution within the watershed. Local expertise and involvement from environmental agencies, federal agencies, schools and universities, and other sources will play critical roles in identifying sources and reducing fecal coliform levels in Fish Pond Drain, and the base flow which enters the stream segment.

Land Use

The Fish Pond Drain drainage basin, as identified in the TMDL Development document is a 28.8 $miles^2$ model area. The land use surrounding Fish Pond Drain is largely agricultural use. The majority of the county uses septic tanks, with City of Donalsonville operating the only sewer system in the county.

Possible causes of increased levels of fecal coliform in Fish Pond Drain include: human waste from sewage leaks or septic tank leaks, domestic animals, livestock, or rural wildlife. Monitoring and analysis of data collected as a part of the implementation plan will be necessary to determine the actual source of the fecal coliform bacteria. Comments at stakeholder meetings indicate a likelihood of FC loads to base flow attributable to livestock operations in the county.

Existing Regulatory or Voluntary Actions

Georgia is in the process of implementing a watershed approach to water resource management through River Basin Management Planning. River basin planning is the foundation for implementation of water protection strategies in Georgia. This approach provides the framework and schedule for actions to address the waters on the Georgia 303(d) list. The basin planning program is based on legislation in 1992 (O.C.G.A. 12-5-520) by the Georgia General Assembly which calls for EPD to develop river basin management plans for each of the major river basins in Georgia. The Flint River Basin Management Plan was completed in 1997.

During 2001, Seminole County is scheduled to adopt the environmental protection ordinances as required under the Georgia Planning Act. These ordinances include Groundwater Recharge Area Protection, River Corridor Protection, and Wetlands Protection Ordinance. Adoption of these environmental protection ordinances is required under the Georgia Planning Act. Seminole County also is completing adoption of county-wide zoning, scheduled for April 2001.

The Georgia Adopt-A-Stream program maintains four underlying principles: to increase public awareness of the state's nonpoint source pollution and water quality issues, to provide citizens with the tools and training to evaluate and protect their local waterways, to encourage partnerships between citizens and their local government, and to collect baseline water quality data. The Southwest Georgia Regional Development Center staff are making plans to incorporate 303(d) listed waters, including Fish Pond Drain, into a regional initiative to develop Adopt-A-Stream programs in the 14-county region. This regional initiative also will include an emphasis on establishing Adopt-A-Stream programs geared to agricultural stakeholders.

Recommended Regulatory or Voluntary Actions
Implementation of measures to address FC levels in the stream segment involves the cooperation of all landowners and land users in the watershed; therefore, broad awareness and involvement are very important to the success of the implementation plan. To better coordinate implementation plan activities, the Southwest Georgia Regional Development Center will establish a Regional TMDL Advisory Group. This group will be composed of individuals with either an interest in or technical knowledge of water quality objectives.

The strong need for increased public awareness of non-point source pollution and its effect on water quality is self-evident. The TMDL Regional Advisory Group will be tasked with coordinating a Mass Media Public Education effort. This ongoing effort is designed to complement existing public education efforts related to improved water quality. This plan will be more fully detailed in the regional implementation strategy, currently under development.

A Water Security Committee of the Southwest Georgia Health and Water Resources Initiative was established March 2001 to address short-term needs related to the continuing drought, and address regional long-term needs of water quality and quantity. This regional committee includes staff of Public Health District 8, Southwest Ga. RDC, Department of Community Affairs, USDA-NRCS, J.W. Jones Ecological Research Center, and Flint River Water Planning and Policy Center. The Southwest Georgia Health and Water Resources Initiative, begun in July 1997, is an informal collaborative group that meets about six times per year to discuss regional issues related to water and health. The HWRI is a partnership of concerned stakeholders: private citizens; economic development; agriculture; industry; research; education; public health; federal, state and local resource and regulatory agencies; and elected officials.

Expand TAP (Targeting our Aquifers) Project, as feasible, to provide education and funding to agricultural community to support construction and implementation of Best Management Practices for animal waste and chemical use. The initial project is funded through a 319(h) Clean Water Act grant and is focused on poultry waste management in a five-county area.

Other voluntary actions include continued participation in water quality and conservation programs administered by Farm Service Agency and USDA Natural Resources Conservation Service. Effectiveness of these programs require increased funding by U.S. Congress. Demand for these programs outpace available funding.

Schedule for Implementing Management Measures
First year Implementation Plan activities are comprised mostly of establishing a monitoring program, and organizing and training Adopt A Stream groups in different counties in the region. By the second year of the implementation plan, data from the summer season and winter season will be available and preliminary sources of the fecal coliform should be identified and analyzed. Management programs, best management practices, monitoring and evaluation of data, and periodic status reports must continue throughout the five-year implementation plan. If the fecal coliform levels remain above the targeted level of 175cfu/100ml during the fifth year of the plan, the process to develop a more stringent Phase II plan should begin during year five. The projected attainment date is ten years from the acceptance of this implementation plan by EPA.

Monitoring Plan
Water quality monitoring is a critical component in determining the success of the implementation plan. Monitoring helps determine compliance with regulations, major sources of loadings, and the effect of regulatory and voluntary measures implemented in the drainage basin. No two watersheds are alike. Therefore, the monitoring of the particular watershed, rather than relying on computer model data, is critical to determine the fecal coliform levels actually present in the impaired water body.

Levels of fecal coliform in Fish Pond Drain will be monitored by standard periodic grab sampling to calculate an instream 30-day geometric mean fecal coliform. Sampling should be scheduled, at a minimum, semi-annually. Samples should be obtained during the summer season (May through October) and during the winter season (November through April) to provide a complete inventory of the conditions in the Fish Pond Drain basin. In addition, sampling should represent periods of dry weather and post-rainfall monitoring. Levels of fecal coliform have been recorded at higher levels directly after rainfall, so this monitoring is key in identifying sources of fecal coliform bacteria. If a source of the fecal coliform bacteria has not been determined after periodic monitoring, the smaller tributaries to Fish Pond Drain should be monitored to help identify the source.

Funding

There are currently several funding sources available for the county to engage in a stable monitoring schedule. Grant funding from Section 319(h) of the Clean Water Act, Nonpoint Source Implementation Grants, may be used for the installation of best management practices (BMPs) for animal waste and landowner education programs. Capitalization Grants for Clean Water State Revolving Funds is a potential source of funding used to aid in urban runoff control, stormwater overflows, riparian buffers, and other water protection activities. Watershed Assistance Grants are also available through the EPA to aid in the development of partnerships to address water quality issues. Other matching grants may be available through the Environmental Protection Agency's Office of Water for both non-point source mitigation and water quality testing. Further research into possible funding sources should be continually conducted over the five-year implementation period.

Criteria to Determine Progress

Progress on the implementation plan will be determined through analysis of water quality sampling results. Periodic monitoring will show the trends of fecal coliform levels throughout the five-year period. The number of regulatory controls or best management practices implemented in the Fish Pond Drain drainage basin will also serve as a measure of progress. The implementation plan will be ultimately deemed successful if, at the end of the five-year implementation period, the fecal coliform levels in Fish Pond Drain are below the 175 cfu/100 ml recommended in the TMDL document and the stream is removed from the 303(d) list.

Conclusion

The implementation of regulatory and voluntary management measures, coupled with the regular monitoring of Fish Pond Drain, should reduce the levels of fecal coliform bacteria present in the water body. The plan has a five-year horizon for the restoration of acceptable levels of bacteria. If the fecal coliform levels in Fish Pond Drain are not at an acceptable level by the end of the fourth year of the plan, a second five-year phase of the implementation plan will be developed.

The establishment of an effective TMDL implementation plan is essential to the environmental and economic health of Seminole County. In order for Seminole County to continue to grow, any drainage basin that has been determined to have excessive levels of fecal coliform must establish a TMDL implementation plan and make a good faith effort to meet the requirements set forth in the plan. If the implementation plan is not efficiently executed, southwest Georgia could face difficulties in public health, the provision of clean, healthful water, and future economic stability and development.

STATE OF GEORGIA

TMDL IMPLEMENTATION PLAN FOR: Fish Pond Drain (STREAM) Fecal Coliform (PARAMETER) RIVER BASIN: Lower Flint

PLAN DATE: March 20, 2001

Prepared by: Carolynn Segers Southwest Georgia Regional Development Center Address: P.O. Box 346. City: Camilla, State: GA. Zip: 31730 e-mail: csegers@surfsouth.com Date Submitted to EPD: March 20, 2001	Or Prepared By: _____ Address: _____ City: _____ State: _____ Zip: _____ e-mail: _____ Date Submitted to EPD: _____

General Information

Obtain this information from the TMDL document or other information. When completed, this document will be a self-contained report independent of the TMDL document.

TMDL ID (to be entered by EPD)	
Water body name	Fish Pond Drain
HUC basin name	Spring Creek Basin
HUC number	03130010
Primary county	Seminole
Secondary county	Miller, Early
Primary RDC	Southwest Georgia
Secondary RDC	NA
Water body location	Lat. 30 d.58'44" Lg. 84 d.52'17"
	Central Seminole County
Miles or area impacted	28.8 miles^2
Parameter addressed in plan	Fecal Coliform
Water use classification	Fishing
Degree of impairment	Partially supporting use ☐
	Not supporting use X
Date TMDL approved by EPA	Feb. 24, 1998
Impairment due to	Point sources ☐
	Nonpoint sources X
	Both ☐

Point source-Form A; Nonpoint source-Form B; Both-Form A+B+C

Significant Stakeholders

Identify local governments, agricultural organizations or significant land holders, commercial forestry organizations, businesses and industries, and local organizations including environmental groups with a major interest in this water body.

Name/Organization	Flint River Soil and Water Conservation District				
Address	2700 Palmyra Rd.				
City	Albany	State	GA	Zip	31707-1845
Phone	229-430-4408			e-mail	
Name/Organization	SWGA Health and Water Resources Initiative				
Address	Health District 8; Unit 2; 1109 N. Jackson St.				
City	Albany	State	GA	Zip	31701-2022
Phone	229-430-4127			e-mail	
Name/Organization	Seminole County Board of Commissioners				
Address	200 S. Knox Ave.				
City	Donalsonville	State	GA	Zip	31745
Phone	229-524-2878			e-mail	
Name/Organization	Miller County Board of Commissioners				
Address	179 S. Cuthbert St.				
City	Colquitt	State	GA	Zip	31737
Phone	229-758-4104			e-mail	
Name/Organization	Calhoun County Board of Commissioners				
Address	P.O. Box 226				
City	Morgan	State	GA	Zip	31766
Phone	229-849-4835			e-mail	

If more, add to comments on last page.

SUMMARY OF ALLOCATION MODEL RESULTS FROM TMDL DOCUMENT (existing load, target TMDL, and needed reduction)

EXISTING LOAD	**TARGET TMDL**	**NEEDED REDUCTION**
1929 cfu/100ml	175 cfu/100ml	1754 cfu/100ml

I. IDENTIFY **NONPOINT SOURCE** CATEGORIES AND SUBCATEGORIES OR INDIVIDUAL SOURCES WHICH MUST BE CONTROLLED TO IMPLEMENT LOAD ALLOCATIONS:

List major nonpoint sources contributing to impairment including those identified in TMDL document.

SOURCE	**DESCRIPTION OF CONTRIBUTION TO IMPAIRMENT**	**RECOMMENDED LOAD REDUCTION (FROM TMDL)**
Base Flow Fecal Coliform	Nonpoint	99%
Agriculture/pasture land uses	Nonpoint	30%

II. DESCRIBE ANY REGULATORY OR VOLUNTARY ACTIONS INCLUDING MANAGEMENT MEASURES OR OTHER CONTROLS BY GOVERNMENTS OR INDIVIDUALS THAT WILL HELP ACHIEVE THE LOAD ALLOCATIONS IN THE TMDL:

See the attachment for more instructions.
Existing or required regulatory actions

RESPONSIBLE GOVERNMENT, ORGANIZATION OR ENTITY	NAME OF REGULATION/ORDINANCE	DESCRIPTION	ENACTED OR PROJECTED DATE (mm/yy)	STATUS
Seminole County	Groundwater Recharge, Wetland Protection, River Corridor Protection Ordinances	Required as part of Georgia Planning Act.	June 2001	Pending DCA Review
Early County	Groundwater Recharge, Wetland Protection, River Corridor Protection Ordinances	Required as part of Georgia Planning Act.	Adopted February 2001	Ongoing-Enforced on future development
Miller County	Groundwater Recharge, Wetland Protection, River Corridor Protection Ordinances	Required as part of Georgia Planning Act.	June 2001	Pending DCA Review
Seminole County	Zoning	Control development in county	April 2001	Pending final adoption
Miller County	Proposed Zoning	Control development in county	June 2002	Planning stage
District Health Office	Septic System Permitting	Ensure compliance with state regulations		Ongoing

Existing voluntary actions

RESPONSIBLE ORGANIZATION OR ENTITY	NAME OF ACTION	DESCRIPTION	ENACTED OR PROJECTED DATE (mm/yy)	STATUS
Agricultural Adopt A Stream Effort	Organize County Groups	Monitoring of streams by local farmers and/or agricultural groups	Sept. 2001	Planning Stage
TMDL Regional Advisory Group	Mass Media Public Education-Outreach	Develop feature articles, interviews, public service announcements about clean water awareness	August 2001	Planning Stage
Interagency work group (NRCS, CES, RC&D, RDC)	Expand TAP (Targeting our Aquifers Program)	319 grant for poultry/livestock waste management and construction of BMPs	July 2001	Implementation to begin

Farm Services Agency	Conservation Reserve Program	Continuous sign-up for buffers	1985	Program for ag producers
Natural Resources Conservation Service	Environmental Quality Incentives Program	State Priority Items	1997	Yearly sign-up for ag producers
Natural Resources Conservation Service	Wetland Reserve Program	On-going wetland restoration program	1985	

Additional recommended regulatory or other measures which should be implemented to reduce the loads of the TMDL parameter

ENTITY/ORGANIZATION RESPONSIBLE	NAME OF PROPOSED REGULATION/ORDINANCE/ OTHER	DESCRIPTION	ENACTED OR PROJECTED DATE (mm/yy)	STATUS

III. SCHEDULE FOR IMPLEMENTING MANAGEMENT MEASURES OR OTHER CONTROL ACTIONS:

These **must be implemented within five years** of when the implementation plan is accepted by EPA.

IMPLEMENTATION ACTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Form stakeholders group	X				
Organize implementation work with stakeholders and local officials to identify remedial measures and potential funding sources	X				
Identify sources of TMDL parameter	X				
Develop management programs to control runoff including identification and implementation of BMPs (Phase I): Agriculture	X	X	X		
Forestry					
Urban					
Mining					
Organize and implement education and outreach programs	X	X	X	X	X
Detect and eliminate illicit discharges	X	X	X	X	X
Evaluate additional management controls needed	X	X	X	X	X
Monitor and evaluate results	X	X	X	X	X
Reassess TMDL allocations	X	X	X	X	X
Provide periodic status reports on implementation of remedial activities		X		X	
If needed, begin process for Phase II (next 5 years) and subsequent phases					X

IV. PROJECTED ATTAINMENT DATE AND BASIS FOR THAT PROJECTION:

The projected attainment date is 10 years from acceptance of the implementation plan by EPA.

V. MEASURABLE MILESTONES:

- Number of management controls and activities already implemented 2

- Number of management controls and activities proposed in five-year work program 7

- Number of management controls and activities actually implemented in five-year work period _____(to be completed after 5 years)

- Stream sampled to identify areas of concern See monitoring plan

- Other _____ _____

- Other _____ _____

VI. MONITORING PLAN:

Monitoring data that placed stream on 303(d) list will be provided if requested.

Describe previous or current sampling activities or other surveys to detect sources or to measure effectiveness of management measures or other controls.

ORGANIZATION	TIME FRAME	PARAMETERS	PURPOSE	STATUS

Describe any planned or proposed sampling activities or other surveys. (Scheduled EPD sampling can be found in the Basin Planning document.)

ORGANIZATION	TIME FRAME	PARAMETERS	PURPOSE	STATUS
EPD	2000 Basin Planning Cycle	FC, others	basin planning	Unknown
TMDL Regional Advisory Group	ongoing	FC, others	Monitoring for planning need for specific BMPs and delisting	Begin July 2001
Adopt A Stream groups	ongoing	FC, others	Auxiliary water monitoring to support TMDL Regional Advisory monitoring program	Begin fall 2001

VII. CRITERIA TO DETERMINE WHETHER SUBSTANTIAL PROGRESS IS BEING MADE:

- % concentration or load change (monitoring program)

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

- Regulatory controls or activities installed (ordinances, laws)

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

COMMENTS
Stakeholder comments indicate likelihood of FC loads to base flow attributable to livestock operations in the county.

Additional Stakeholders

Title	FirstName	LastName	Company	Address1	Address2	City	State	PostalCode
Dr.	Elizabeth	Blood	Jones Ecological Research Center	Rt 2, Box 2324		Newton	GA	31770
	Ron	Brown	Natural Resources Conservation Service	1016 Lowe Rd.		Albany	GA	31701
	Paul	DeLoach	Miller Brewing Company	405 Cordele Rd.		Albany	GA	31705
	Elizabeth	Dean	Planning and Development Services	P.O. Box 447		Albany	GA	31702
	Joy Jones	Keys	Sen. Max Cleland's	235 Roosevelt		Albany	GA	31701

Title	FirstName	LastName	Company	Address1	Address2	City	State	PostalCode
			Office	Ave., Suite 101				
	Jimmy	Knight	Albany Water Gas & Light	P.O. Box 1788		Albany	GA	31702
	Terry	Kile	GDNR Game Management	2024 Newton Road		Albany	GA	31701
Dr.	James E.	Hook	UGA NESPAL	P.O. Box 748		Tifton	GA	31793-0748
	Kerry	Harrison	GES Engineer	Rural Development Center	P.O. Box 1209	Tifton	GA	31793
	Mel	Jones	Environmental Health Program	Health Dist. 8, Unit 2	1109 North Jackson St.	Albany	GA	31701-2022
Dr.	Richard	Lowrance	Southeast Watershed Research Lab	USDA-ARS		Tifton	GA	31793-0946
	Spencer	Mueller	DCA Region 10	265 N. Main St.		Blakely	GA	31723
Dr.	Paul	Newell	Health District 8, Unit 2	1109 North Jackson St.		Albany	GA	31701-2022
	Commanding General	(Code A490)	Environmental Health Branch	Marine Corps Logistics Base	814 Radford Blvd.	Albany	GA	31704-1128
	Susan	Reyher	Environmental Health Section	Dougherty County Health Dept.	P.O. Box 1827	Albany	GA	31702-1827
	Douglas	Pope	Pope Consultants	1009 Eight Mile Rd.		Albany	GA	31707
	Russ	Ober	Fisheries Management	Ga DNR	2024 Newton Road	Albany	GA	31701
	John	Sperry	Consulting Engineer	2529 East Alberson Dr.		Albany	GA	31707
	Russell	Tonning	Soil and Water Conservation Comm.	2700 Palmyra Rd.		Albany	GA	31707
	Jody	Redding	Sen. Miller's Office	P.O. Box 2648		Moultrie	GA	31768
	Jerry	Usry	Flint River WPPC	P.O. Box 345		Albany	GA	31702-0345
	Elliott	Jones	USGS Hydrologist	3039 Amwiler Road, Suite 130		Atlanta	GA	30360-2824
	Jerome	Brown	Golden Triangle RC&D	712-R County Street		Blakely	GA	31723-2203
Dr.	Craig	Hedman	Forest Resources Division	International Paper	719 Southlands Road	Bainbridge	GA	31717

Title	FirstName	LastName	Company	Address1	Address2	City	State	PostalCode
	Judy	Bowles	Keep Albany Dougherty Beautiful	2106 Habersham Dr.		Albany	GA	31701
Dr.	Steve	Golliday	Jones Ecological Center	Route 2, Box 2324		Newton	GA	31770
	Alan	Isler	Ga Forestry Commission	3561 Hwy. 112		Camilla	GA	31730
	Stephen	Syfrett	Advanced Environmental Technologies	P.O. Box 70246		Albany	GA	31708-0246
	Tony	Roberts	UGA CES District Agent-Agriculture	P.O. Box 1209		Tifton	GA	
	Rome	Ethredge	Seminole County Extension Agent	207 E. Crawford St.		Donalsonville	GA	
	Tim	Moore	Miller County Extension Agent	406 W. Crawford St.		Colquitt	GA	
	Paul	Wrigley	Calhoun County Extension Agent	P.O. Box 309		Morgan	GA	31766