

TMDL IMPLEMENTATION PLAN FOR BROOKLYN CREEK

Introduction

Brooklyn Creek is in the Oconee River Basin. The stream segment is listed on the §303(d) list for the State of Georgia for not meeting the water quality standard for fecal coliform to support its designated use of fishing. It is one of eight stream segments being addressed within Athens-Clarke County simultaneously. The U.S. Environmental Protection Agency developed a total maximum daily load estimate (TMDL) for the creek, based on a prediction of a 30-day geometric mean of 1759 cfu/100ml and suggested a reduction of 96% in surface runoff and 50% reduction in groundwater/interflow. The purpose of this implementation plan is to identify and eliminate sources of fecal coliform in the drainage basin in order to meet the fecal coliform water quality standard.

Overview

The drainage basin of Brooklyn Creek lies wholly within the boundaries of the Unified Government of Athens-Clarke County. The drainage is a small part of the HUC 12-digit watershed, and defining the precise boundary will be an early task in the implementation plan.

The drainage area is a fully developed urban area. Land uses include extensive commercial, multi-family residential, single-family residential, and public/institutional. The regional library, three schools, and an annex of a hospital lie in the basin, as well as a major commercial area of Athens-Clarke County. The area is fully served by sewerage. However, the neighborhoods are old, some are of low-moderate income, and there is suspicion that some old houses may have relict septic tanks, cesspools, or even illicit discharges to the drainage system.

Possible sources of fecal coliform in the basin include overflows and failures of sewer lines; malfunctioning relict septic tanks; illicit direct discharge of residential or business wastewater into tributary streams; animal waste (pets and wildlife); and storm water runoff. There are no known problem areas with sewers in the area now, but there have been overflow problems in the past that were remediated (date uncertain).

Pinpointing individual sources typically requires extensive analysis and monitoring of the stream and its tributaries during both wet and dry weather conditions.

Current Activities

Past development regulations in Athens-Clarke County (in place for some time) required detention ponds for large developments. However, these ponds have limited usefulness for water quality, because the ordinance is designed to address water quantity only. These ponds are inspected only during project construction. There is no program for periodic inspection of the ponds except in response to complaints. It is not known how many ponds are situated in the basin, or their locations.

Athens-Clarke County adopted a new land development code in December, 2000, that will require additional treatment of storm water runoff for water quality as well as water quality. The ordinance at present calls for implementation through storm water management manuals to be adopted at a later date. These manuals are under development. However, the Brooklyn Creek drainage is fully developed, and future water quality guidelines will affect only redevelopment projects.

Future Activities

Watershed Team Formation

A Clarke County Watersheds Task Force will be formed to work on fecal coliform reduction in this basin as well as others in the county. Currently, the task force consists of representatives from the departments of Public Works (in charge of the storm water program), Utilities (in charge of sewerage), and Planning (in charge of land use planning and regulation). The Upper Oconee Watershed Network (UOWN), a public interest group interested in water quality in the Oconee River Basin, has volunteered to participate by linking its stream monitoring activities to the TMDL implementation plans. The Athens-Clarke County public health office will be added to the task force, as will the district and county offices of the Natural Resources Conservation Service.

In addition to the working task force, a stakeholders' group will be formed of persons with an interest in the watersheds. One meeting has been held with stakeholders. The Upper Oconee Watershed Network, Georgia Legal Watch/Community Watershed Project, and interested members of the community attended and expressed interest in continuing to participate. Additional groups and individuals will be contacted and invited to participate in the overall county effort and the Brooklyn Creek effort specifically. This group will identify areas of concern, offer input to and feedback on plans, participate in outreach and education, and recruit support from the community.

For the Brooklyn Creek TMDL plan, the regional library board and Clarke County School Board will likely be added as stakeholders.

Public Education

The task force and stakeholders' group will identify or develop materials to use in a public education campaign to inform citizens of the need to reduce sources of waste that might produce fecal coliform and minimize the exposure of storm water to these sources. The campaign will begin immediately and will inform the public of steps they can take to reduce possible sources. The task force will also decide where, when, and how to disseminate this information.

Compiling Additional Information

Among the first steps in implementing this plan will be to compile additional data. Information needed will include, but not be limited to: Accurate delineation of the drainage (first using 7.5 min. topographic data and later from the storm water study under way now); collection of existing stream sample data; collection of spill and leak reports connected with the sewer system; and collection of data from the utilities department to match addresses with sewer billing to determine if there are any extant septic tank systems in the drainage..

Monitoring

All existing data on fecal coliform concentrations in Brooklyn Creek will be compiled. Additional monitoring may be needed. The task force, with help from the stakeholders' group, will determine the specifics for baseline monitoring (such as selecting the locations, frequency, and conditions of monitoring), seek funding from local, state, and federal sources, and conduct the baseline monitoring as needed (provided that funding can be secured). Sampling costs, if carried out by county staff and tested in-house, are estimated to be approximately \$100 per sample. The purpose of the monitoring will be to identify the sources of fecal coliform in the basin in order to target them for abatement. The task force will consider setting up the BASINS/NPSF water quality model, with the assistance of the Northeast Georgia Regional Development Center, to incorporate and better analyze the monitoring data.

The Upper Oconee Watershed Network, and possibly other citizens' groups, sample for fecal coliform as part of their activities. UOWN has indicated a desire to direct their activities specifically toward TMDL-related stream segments. However, the level of training, certification, and oversight of their citizen monitors is unknown. Volunteer fecal coliform sampling will be a part of the monitoring program for this basin. In order to ensure that the data collected is reliable, the program will include cooperative efforts to ensure that data are collected using trained personnel and approved protocols.

The Georgia EPD is scheduled to conduct monitoring of the Oconee Basin in 2004 in support of its 5-year River Basin Management Plan cycle. In addition, the task force may participate in additional monitoring in 2004 - 2005 to determine the effectiveness of implementation plan activities.

Source Identification

After analyzing the monitoring data, the task force will seek to identify and rank potential sources of fecal coliform. It is anticipated that the stakeholders' group will be valuable in this step. Possible sources in the drainage include illegal discharges, septic tank failures, animal waste from pets and wildlife, poorly sited and managed commercial solid waste receptacles, and miscellaneous urban surface runoff.

Pollution Reduction Strategies

Considerable data are available and will be tapped to identify any extant septic tank users and potential areas of concern. If failing septic tank systems are found, prompt action will be taken through the health department to eliminate them.

Public education and outreach will be an important part of the strategy. Informing residents and businesses about the fecal coliform violation is a necessary step to recruiting their support and changing individual behaviors. Outreach will include information about on-site septic systems, disposal of pet waste, and other non-point source pollution prevention. The Upper Oconee Watershed Network is already very active in this area. Strategies could include a web page, mass mailings, attendance at civic clubs and homeowners' association meetings, stream walk\,s, and stream clean-ups.

Athens-Clarke County falls under the Phase II storm water regulations, and is currently undertaking a storm water study, conducted by the consulting firm of Arcadis, Geraghty, and Miller, in order to comply with the requirements of the general permit by 2003. Originally conceived as primarily a water quantity study, the scope of work has been amended to address water quality issues as well. Additional outcomes of this planning effort will be detailed drainage basin mapping at the 2-foot and 1-foot contour level, GIS mapping of all storm sewer lines of eight inches or greater, and the identification of specific problem areas.

Phase I Implementation

Funding options will be explored by the task force. The Clean Water Act §319 funds, state revolving loan fund, Georgia Environmental Facilities (GEFA) grants and loans, Community Development Block Grants, and local funds are sources to explore. Human resources are available through local water quality citizens' groups and will be explored, as well as the many services of the University of Georgia.

Once funding is established, the task force members will pursue measures to reduce the contributions of the sources identified.

Monitoring Progress

After implementation of the strategies has continued for a reasonable length of time, monitoring will be repeated to determine the extent of improvement. The purpose will be to have Brooklyn Creek removed from the §303(d) list if monitoring shows compliance with the fecal coliform standard.

Subsequent Phases

If the second round of monitoring shows that the stream remains in violation of the fecal coliform standard, then the previous steps will be repeated until acceptable water quality is attained.

Reporting

The task force will write an annual report on progress on the TMDL implementation plan and will prepare a final report showing that water quality compliance has been achieved.

Ongoing Maintenance, Monitoring, and Follow-up

The task force will develop a strategy for maintaining the water quality standard in the future. It will also devise a method of monitoring to assure that standards are indeed maintained.

This plan may be modified according to experience and circumstances.

STATE OF GEORGIA
 TMDL IMPLEMENTATION PLAN FOR: Brooklyn Creek
 (STREAM)

RIVER BASIN: Oconee
 (PARAMETER) PLAN DATE: 3/27/01

Prepared by: Joseph Tichy Northeast Georgia Regional Development Center Address: 305 Research Drive City: Athens State: Georgia Zip: 30605 e-mail: jtichy@negrdc.org Date Submitted to EPD: _____		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.		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.					
TMDL ID (to be entered by EPD)	OCO0000003	Name/Organization	Unified Government of Athens-Clarke County				
Water body name	Brooklyn Creek	Address	P.O. Box 1868				
HUC basin name	Upper Oconee River	City	Athens	State	GA	Zip 30603-1868	
HUC number	030701010307	Phone	706-613-3470		e-mail		
Primary county	Clarke	Name/Organization	Athens-Clarke County Board of Health				
Secondary county	N/A	Address	**				
Primary RDC	Northeast Georgia	City		State		Zip	
Secondary RDC	N/A	Phone			e-mail		
Water body location	Athens (Clarke County)	Name/Organization					
		Address					
Miles or area impacted	1.9 mi.	City	Athens	State	GA	Zip 30601	
Parameter addressed in plan	Fecal coliform	Phone	706-546-9008		e-mail		
Water use classification	Fishing	Name/Organization					
Degree of impairment **	Partially supporting use <input type="checkbox"/>	Address					
	Not supporting use <input checked="" type="checkbox"/>	City		State	GA	Zip 30603	
Date TMDL approved by EPA		Phone			e-mail		
Impairment due to	Point sources <input type="checkbox"/>	Name/Organization					
	Nonpoint sources <input checked="" type="checkbox"/>	Address					
	Both <input type="checkbox"/>	City		State		Zip	
Point source-Form A; Nonpoint source-Form B; Both-Form A+B+C		Phone			e-mail		

If more, add to comments on last page.

FORM B

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

EXISTING LOAD	TARGET TMDL	NEEDED REDUCTION
1759 cfu/100ml	150 cfu/100ml	1609 cfu/100ml (91%)

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)
Urban Pervious (runoff)	Pet and wildlife waste from runoff; dumpsters; miscellaneous urban.	96%
Urban Impervious (runoff)	As above; sewer leakage and overflow; possible relict septic tanks	96%
Urban Pervious (interflow/gw)	Leaking sewers, infiltration, septic tanks, illicit discharges	50%

II. DESCRIBE ANY REGULATORY OR VOLUNTARY ACTIONS INCLUDING MANAGEMENT MEASURES OR OTHER CONTROLS BY GOVERNMENTS OR INDIVIDUALS THAT SPECIFICALLY APPLY TO THE POLLUTANT AND THE WATERBODY FOR WHICH THE TMDL WAS WRITTEN, THAT WILL BE ACCOMPLISHED THROUGH RELIABLE AND EFFECTIVE DELIVERY MECHANISMS, AND 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
Clarke County Health Dept.	Septic Tank Permitting	Requires permitting of septic tanks, proper wastewater disposal	Unknown	Ongoing
Athens-Clarke County Planning Dept.	Land Development Ordinance	Require some storm water facilities on larger developments – driven by quantity, not quality.	Unknown	Ongoing

Existing voluntary actions

RESPONSIBLE ORGANIZATION OR ENTITY	NAME OF ACTION	DESCRIPTION	ENACTED OR PROJECTED DATE (mm/yy)	STATUS
Community Watershed Project	Education & Research	Brochures, stream walks, Annual “River Rendezvous”; press articles	Ongoing	Ongoing
ACC Utilities Dept.	Maintenance	Regular clearing and inspection of sewer lines; continual inspection of known problem locations	Ongoing	Ongoing

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
Athens-Clarke County; volunteer organizations	Monitoring	Monitoring regime TBA to identify specific sources	08/01	Under discussion
Athens-Clarke County	Storm Water Ordinance/System Design	Incorporate water quality into design and operation of storm water facilities; incorporate storm water quality control into development ordinances	2003	Under study for general NPDES storm water permitting
ACC, Health Dept., other TF members	Illicit discharges	Identify any illicit connections of fecal sources to drainage system, failed septic systems	2002 +	Under consideration

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

These must be implemented as expeditiously as practicable 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	X			
Identify sources of TMDL parameter	X	X			
Develop management programs to control runoff including identification and implementation of BMPs (Phase I):					
Agriculture					
Forestry					
Urban		X	X	X	X
Mining					
Organize and implement education and outreach programs	X	X	X	X	X
Detect and eliminate illicit discharges		X	X		
Evaluate additional management controls needed			X		
Monitor and evaluate results				X	X
Reassess TMDL allocations					X
Provide periodic status reports on implementation of remedial activities and review/modify implementation plan		X	X	X	X
If needed, begin process for Phase II (next 5 years) and subsequent					

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	2004	All	basin planning	
Upper Oconee Watershed Network	2001 – 2005	FC, other	Support for TMDL implementation	Under consideration
Athens-Clarke County (Utilities & Public Works Depts.)	2001 – 2005	FC	Support for TMDL implementation	TBD pending ability to secure funding from local, state, federal sources

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, park management)

COMMENTS
