TMDL IMPLEMENTATION PLAN
for
FECAL COLIFORM BACTERIA
in
REED CREEK
COLUMBIA COUNTY, GEORGIA

Developed by:

Central Savannah River Area
Regional Development Center
3023 Riverwatch Parkway, Suite A
Augusta, GA 30907

Andy Crosson, Executive Director
Lori L. Sand, AICP, Planning Director
Mary Huffstetler, AICP, Transportation Planner
Shelby Powell, Regional Planner

September 20, 2001

STATE OF GEORGIA
TMDL IMPLEMENTATION PLAN FOR: Reed Creek (STREAM) Fecal Coliform (PARAMETER) RIVER BASIN: Savannah
PLAN DATE: _____

Prepared by: Central Savannah River Area Regional Development Center Address: P. O. Box 2800 City: Augusta State: GA Zip:30914 e-mail: lsand@csrardc.org Date Submitted to EPD: September 21, 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.

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)		Name/Organization	**SEE APPENDIX D**				
Water body name	Reed Creek	Address					
HUC basin name	Savannah	City		State		Zip	
HUC number	030601060501	Phone				e-mail	
Primary county	Columbia	Name/Organization					
Secondary county	None	Address					
Primary RDC	CSRA	City		State		Zip	
Secondary RDC	None	Phone				e-mail	
Water body location	Bowen Pond to Savannah	Name/Organization					
	River	Address					
Miles or area impacted	1 mile	City		State		Zip	
Parameter addressed in plan	Fecal Coliform	Phone				e-mail	
Water use classification	Fishing	Name/Organization					
Degree of impairment	Partially supporting use ■	Address					
	Not supporting use ☐	City		State		Zip	
Date TMDL approved by EPA		Phone				e-mail	
Impairment due to: Urban Runoff	Point Sources ☐	Name/Organization					
	Nonpoint sources ■	Address					
	Both ☐	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.

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

EXISTING LOAD	TARGET TMDL	NEEDED REDUCTION
Unknown*	200 cfu/100 ml (May- October)	Unknown**
	1000 cfu/100 ml (November-April)	Unknown**

*TMDL document does not specify an existing load of fecal coliform

**Unable to determine needed reduction due to lack of existing load data

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 and Impervious	Paved and developed urban lands contribute to increased urban runoff	
Sewer Systems	Failure in sewer collection systems	
Wastewater Treatment Plant	A wastewater treatment plant lies adjacent to Reed Creek and discharges in to the water body.	

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:

Existing or required regulatory actions

RESPONSIBLE GOVERNMENT, ORGANIZATION OR ENTITY	NAME OF REGULATION/ ORDINANCE	DESCRIPTION	ENACTED OR PROJECTED DATE	STATUS
Columbia County Water Works	Sanitary Sewer Maintenance	Measures are taken to ensure that spills and leaks are addressed as soon as they are detected.	1960	Active
Columbia County	Land Development Review Process	Ensures compliance with land use, engineering, and environmental regulations	April, 1994	Active
Columbia County	Soil Erosion and Sedimentation Control Ordinance	Provides a 25 foot minimum protective buffer along Reed Creek.	October, 1995	Active

RESPONSIBLE GOVERNMENT, ORGANIZATION OR ENTITY	NAME OF REGULATION/ ORDINANCE	DESCRIPTION	ENACTED OR PROJECTED DATE	STATUS
Columbia County	Greenspace Plan	A Plan to protect a minimum of 20 % of natural greenspace in Columbia County by targeting preservation of natural resources including rivers and creeks.	March, 2001	Active
Georgia DNR, EPD	Savannah River Basin Management Plan 2000	Program to protect, enhance, and restore the waters of the Savannah River Basin by monitoring, regulating, allocating, and managing land uses in the river basin.	April 2001	Ongoing
Columbia County/ EPD/ Citizens Advisory Group/ Techical Advisory Committee	Central Savannah River Area Source Water Assessment	A study of 10 intakes in the Savannah River Basin to determine levels and causes of pollution and development of an action plan to protect source water.	Results Expected October, 2001	Underway
Columbia County	Groundwater Recharge Protection Ordinance	Limits density and types of land uses in groundwater recharge areas, including waste disposals and septic tank drainfields to protect groundwater quality.	February 2002	Underway
Columbia County	Water Supply/ Watershed Protection	Limits types and density of development that would impair the water supply or watershed.	February 2002	Underway
Columbia County	River Corridor Protection Ordinance	Established measures to guide and control growth in areas along the Savannah and Ogeechee Rivers to protect the water quality and the river corridors' plant and wildlife habitats.	February 2002	Underway
Columbia County	Wetlands Protection Ordinance	Establishes boundaries around wetlands within the county and limits types and density of development to protect water quality and habitats within these areas.	February 2002	Underway
Columbia County	Municipal Separate Storm Sewer System (MS4) Permit	Establishes legal Authority for Columbia County to detect and eliminate all illicit connections to the storm sewer system. The permit also has requirements to develop and enforce a storm water management program that encompasses water quality monitoring, engineering controls, comprehensive land planning, and public participation.	2002	Part II Permit Application submitted June 2000. Approval Pending.

Existing voluntary actions

RESPONSIBLE ORGANIZATION OR ENTITY	NAME OF ACTION	DESCRIPTION	ENACTED OR PROJECTED DATE	STATUS
Citizens of Columbia County/ Columbia County/ Georgia State Data and Research Center/ National Science Center, Fort Discovery/ Columbia County School System.	Adopt-a-Stream Program (ECO Partners) Contact – Ginny Brady (706) 821-0632.	A Georgia Department of Natural Resources, Environmental Protection Division, Program designed to raise public awareness about water quality. The program enlists the pubic's support and action in monitoring and protecting water resources.	Ongoing	
Citizens of Columbia County	Local Sierra Club Chapter	Group of citizens interested in protection of water bodies and other environmental concerns.	Ongoing	
Citizens of Columbia County	Savannah Riverkeeper, Inc.	Citizen group protecting water quality of the Savannah River Watershed	Ongoing	
Metro Augusta Clean and Beautiful, Jefferson Co. Clean and Beautiful, Columbia Co. Clean and Beautiful, Augusta Dive Club	Rivers Alive annual volunteer river clean up	A statewide event that targets cleanups across all waterways in the State of Georgia including streams, rivers, lakes, and wetlands. The mission of Rivers Alive is to create awareness of and involvement in the preservation of Georgia's water resources.	September, October	Annual
Southeastern Natural Sciences Academy	Phinizy Swamp Nature Park - Educational Outreach	Offers teacher orientation, field trips, and other educational opportunities for children and adults at the 1100 acre swamp.	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	STATUS
Columbia County Schools/ Metro Augusta Clean and Beautiful	Enviroscape Contact – Beth Schussler 828-2109	A program to be implemented in the schools which educates children of the effects of stormwater runoff. The program provides training for teachers, also.	TBA	TBA
Columbia County School System	River Kids Program	A statewide curriculum incorporated into the School System to exchange data and ideas.	TBA	TBA

ENTITY/ ORGANIZATION RESPONSIBLE	NAME OF PROPOSED REGULATION/ ORDINANCE/ OTHER	DESCRIPTION	ENACTED OR PROJECTED DATE	STATUS
Columbia County School System	Global Learning and Observation to Benefit the Environment (GLOBE).	A program for K-12 students, teachers, and scientists from around the world working together to learn about the environment. GLOBE is available in the State of Georgia in the DeKalb County School System, at Georgia Tech, and at the State University of West Georgia, Carrollton.	TBA	TBA
Columbia County School System	Water Environment Federation	This is a not-for-profit technical and educational organization that researches and publishes the latest information wastewater treatment and water quality protection. The organization provides technical expertise and training on issues including nonpoint source pollution.	TBA	TBA
Columbia County or Other Interested Group	Septic Tank Survey	A survey should be conducted in the Reed Creek Drainage Basin to determine the number and location of homes using septic tanks.	TBA	TBA
Columbia County	Septic to Sewer Incentive Program	An educational and/or incentive program to encourage conversion of septic tank to Columbia County's sewer system. Septic tank maintenance/ repair education would be beneficial, also.	TBA	TBA
Columbia County	Stormwater treatment	This may occur as a result of the MS4 Permit. A combination of physical structures such as ponds or devices to facilitate pollutant fallout prior to entering the stream may be developed to treat stormwater runoff.	TBA	TBA
Columbia County Water Works	Sanitary Sewer Maintenance	Plans to develop additional proactive measures to prevent spills and leaks from the sanitary sewer system.	TBA	TBA
Columbia County	Public Education Program on Septic Tank Issues	TV/radio/print ads explaining importance of repairing leaky septic tanks and properly maintaining septic tanks	TBA	TBA
Columbia County	Georgia Stormwater Management Manual	County should adopt this manual developed by the Atlanta Regional Commission to address water quality by establishing BMPs and other development measures.	TBA	TBA
Columbia County School System	Participate in Spirit Creek Educational Forest	Currently trains teachers on monitoring and testing methods using Spirit Creek as a training ground; program could expand to include fecal coliform testing	TBA	TBA
Fort Discovery, County Board of Education	Teltrain Educational Program	Satellite program broadcasted by the National Science Center at Fort Discovery. Program is geared towards middle school children, and focuses on science, math, and technology subjects.	TBA	TBA

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	x	x	x
Identify sources of TMDL parameter		x*	x	x	x
Develop management programs to control runoff including identification and implementation of BMPs (Phase I): Agriculture	x**	x	x	x	x
Forestry	x**	x	x	x	x
Urban	x**	x	x	x	x
Mining					
Organize and implement education and outreach programs	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
Provide periodic status reports on implementation of remedial activities	x	x	x	x	x
If needed, begin process for Phase II (next 5 years) and subsequent phases					x

*After completion of a full year of sampling data preliminary identification of sources of fecal coliform bacteria will be made.
**Programs and BMPs will be implemented as possible and as necessary throughout the 5-year period.

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 _____11_____

- Number of management controls and activities proposed in five-year work program _____11_____

- 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
Columbia County Water Department	3-99 to 8-01	Fecal Coliform	To Monitor Fecal Coliform Levels	Continuing See Attached Data

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			Basin Planning	Plan is under Development
Columbia County Water Department	2001 until problem is resolved. Samples should represent the warm and cool season and should be taken on both dry and post-rain days.	Fecal coliform	To monitor levels of fecal coliform and to determine success of plan implementation.	

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

- % concentration or load change (monitoring program) – Goal of a 10% reduction in loading and/or resultant concentrations from urban pervious and impervious land uses

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

- Regulatory controls or activities installed (ordinances, laws) – Monitor the number of regulatory and voluntary programs implemented during the five year program

- Best management practices installed (agricultural, forestry, urban) – Ensure that BMPs are being implemented in the Reed Creek drainage basin.

COMMENTS

The local Sierra Club chapter has expressed concern about the number of new power plants proposed in the State of Georgia. The power plants may extract more water from the impaired water bodies than they return, which would raise the concentration of fecal coliform in the impaired sections.

STATE OF GEORGIA
TMDL IMPLEMENTATION PLAN
FOR REED CREEK, COLUMBIA COUNTY, GEORGIA

Background

Reed Creek in Columbia 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 a partially supporting use and the TMDL for Reed Creek is set at a target level of 200 cfu/100 ml of water May through October and 1000 cfu/100 ml November through April, a level that will allow the water body to achieve water quality standards necessary for the beneficial use classification of fishing.

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 water sources 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 reduce or eliminate the pollutants contained in the runoff into Reed Creek. See the attached Reed Creek Study Area map to determine the location of the impaired water body.

Existing TMDL and Monitoring Data

Currently, one source of data is available for the one-mile impaired segment of Reed Creek. This data is included in Appendix A.

More data is 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 Reed Creek. The TMDL Document can be found in Appendix B.

Land Use

The Reed Creek drainage basin is of mixed land use development. While its residential land use is fairly high, there are some areas of rural development. Portions of the residential areas in the drainage basin rely on septic tanks.

Possible causes of increased levels of fecal coliform in Reed Creek include: human waste from sewage leaks or septic tank leaks, domestic animals, urban wildlife, 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. The location of the Reed Creek Project Area can be seen in Appendix C.

Stakeholder Meetings

To look into the problem further, local stakeholders were advised of the problem. These stakeholders were notified through contact with the involved county officials, and through an advertisement published in the Columbia News Times newspaper. A meeting of the stakeholders was held both August 2, 2001 and August 6, 2001 to gather information about possible causes of and potential solutions the problem. A list of stakeholders is included in Appendix D.

This meeting was conducted by Shelby Powell, CSRA RDC Regional Planner and Mary Huffstetler, CSRA RDC Transportation Planner. At the meeting, the goal of this plan was explained to the stakeholders, and stakeholders were invited to comment on ideas of sources of pollution and offer suggestions to reduce or prevent increases in fecal coliform bacteria. The main concerns of stakeholders at the meeting were leaking sanitary sewer pipes traversing Reed Creek, and leaking septic tanks in the drainage basin. It was recommended that the sewer line and septic systems be inspected for leaks.

Stakeholders also pointed out the necessity for specific testing to determine whether or not the fecal coliform was of a human or animal origin. A concern for the domestic animal populations in the area, as well as wild birds and other wild animals, was expressed. The Sierra Club recommended increasing the buffer adjacent to streams from 25 feet to 100 feet where possible. Natural habitat restoration along the banks of Reed Creek was suggested to serve as a natural buffer to the stormwater runoff as it enters the creek. Also, a hydrologist was recommended to work closely with Columbia County to aid in solutions to stormwater channelization.

The stakeholders were invited on September 6, 2001 to an advertised public meeting to view the draft implementation plan. Several minor changes to language and terminology used in the plan were suggested, but overall the stakeholders were receptive to the implementation plan's ability to meet TMDL goals.

Existing Regulatory or Voluntary Actions

The Columbia County Water Works Department is active in preventing and reacting to spills and leaks that may occur in the sanitary sewer lines throughout the county. Spills sometimes result from clogged sewer lines or vandalism that has occurred to the system.

The County currently monitors illicit connections to the system and responds immediately to any problems within the system that may result in a spill or leak of sewage. If a spill does occur, drainage ponds in the area of the spill are aerated to ensure the decomposition of harmful bacteria that may be present in the water.

Columbia County has maintained a strict Land Development Review process since April, 1994. This process ensures compliance with land use, engineering, and environmental regulations throughout the County. Columbia County has also applied for a Municipal Separate Storm Sewer System (MS4) Permit which establishes legal authority for Columbia County to detect and eliminate all illicit connections to the storm sewer system. The permit also has requirements to develop and enforce a stormwater management program that encompasses water quality monitoring, engineering controls, comprehensive land planning, and public participation. This permit has been applied for and approval is expected in Spring of 2001.

Another tool in place in Columbia County is the Soil Erosion and Sedimentation Control Ordinance. This ordinance protects streams in Columbia County by establishing a 25-foot protective buffer along each side of the streams. The ordinance takes the same steps to protect streams as the River Corridor Protection Ordinance takes to protect rivers in Columbia County. By limiting septic tank usage within these stream buffers, the possibility of leakage is reduced; thus the potential for loading of fecal coliform bacteria from leaking septic tanks is lessened.

Columbia County has recently completed a Greenspace Plan, a result of the passage of Senate Bill 399, which officially created the Georgia Greenspace Program. The Greenspace plan includes an inventory of greenspace, identifies desirable parcels of land and water for protection, and requires appropriate changes to the county's comprehensive plan. Ultimately, a minimum of twenty (20) percent of natural greenspace, including lands adjacent to Reed Creek, in Columbia County will be preserved. The Greenspace Plan is complete and is awaiting approval from the Georgia Department of Natural Resources. The plan should be approved during Spring, 2001.

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 Assembly which calls for EPD to develop river basin management plans for each of the major river basins in Georgia. The Savannah River Basin Management Plan should be adopted in April, 2001.

Another project underway involving water quality is the Central Savannah River Area (CSRA) Source Water Assessment. The Augusta Utilities Department is responsible for coordinating this effort, and is working with consulting firm Parsons Brinkerhoff. This study includes determining levels and sources of pollution, and the development of an action plan to protect source waters in the CSRA. This study involves several counties in

the CSRA region. Some results from this plan are expected in October 2001. The action plan developed as part of this project will be useful in determining what measures need to be taken lower fecal coliform levels in Reed Creek.

Three environmental protection ordinances are scheduled for implementation in Columbia County by February of 2002. These ordinances include Groundwater Recharge Protection, Water Supply/ Watershed Protection, River Corridor Protection Ordinance, and Wetlands Protection Ordinance. The Groundwater Recharge Area Protection Ordinance protects lands within recharge areas by limiting the number and density of septic tank drainfields, hazardous waste storage, disposal, and handling facilities, and chemical storage facilities. Some of the types of development regulated by this ordinance directly relate to fecal coliform levels. Thus, the enforcement of this ordinance keeps fecal coliform levels lower in groundwater recharge areas.

The Water Supply/ Watershed Protection Ordinance will limit types and density of development that would impair the water supply or watershed. This ordinance will allow for the establishment of protective buffers around streams where septic tanks are not allowed to be placed. This ordinance will also limit impervious surface adjacent to streams.

The River Corridor Protection Ordinance protects land within 100 feet horizontally on both sides of the Savannah River. Since the impaired Reed Creek flows directly into the Savannah River, it is directly affected by this ordinance. New construction is prohibited in the river corridor except for single family houses on two-acre or larger lots. Septic tanks and septic tank drainfields are prohibited in the river corridor, as are hazardous waste and solid waste landfills. These provisions help to keep pollution flowing into the river at a minimum. Potential for fecal coliform bacteria caused by leaking septic tanks is decreased by this ordinance.

The Wetlands Protection Ordinance protects wetlands in Columbia County from alterations that will significantly affect or reduce their primary functions for water quality control, floodplain and erosion control, groundwater recharge, aesthetic nature, and wildlife habitat. This protection is achieved through land use controls on lands surrounding wetlands. The floodplain control measures contained in the ordinance also serve to indirectly control fecal coliform bacteria levels because of the direct correlation between fecal coliform bacteria levels and flow rates. Less unnatural flooding and water diversion means lower flow rates, and therefore, lower fecal coliform levels.

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 quality baseline water quality data. The Georgia Adopt-A-Stream has been a successful program in Columbia County. A partnership between Grovetown Elementary School, Harlem Middle School, Greenbrier High School, and Baker Road Landfill in Columbia County has proven to be very successful in maintaining quality monitoring of Euchee

Creek in Columbia County. The program is not currently active in the Reed Creek drainage basin; however, the coordinator for Columbia County, Ginny Brady, is making plans to incorporate Reed Creek into the Adopt-A-Stream program in Columbia County.

The Sierra Club, with over 600,000 members, has an active chapter in the Reed Creek area. The mission of the Sierra Club is as follows: explore, enjoy, and protect the wild places of the earth; practice and promote the responsible use of the earth's ecosystems and resources; educate and enlist humanity to protect and restore the quality of the natural and human environment; and use all lawful means to carry out these objectives. The presence of a group with strong dedication to the protection of the environment is positive for the area. The Sierra Club should take an active role in helping in the implementation of the strategies identified in this plan.

A new volunteer activist group has formed recently in the area. The Savannah Riverkeeper, Inc. is a part of the national Riverkeepers program. This group is concerned with protecting the water quality of the Savannah River watershed. The group's efforts will be mainly concentrated around the Augusta area, which will be beneficial in terms of the water quality of streams and creeks flowing into the Savannah River. This group should also take an active role in the implementation of strategies identified in this plan.

Metro Augusta Clean and Beautiful works each year in conjunction with the Jefferson and Columbia County Clean and Beautiful organizations to conduct the Rivers Alive annual volunteer river clean-up. This statewide event occurs annually in September or October. Georgia's rivers are targeted for cleaning by the volunteers in the community. The mission of this program is to create awareness of and involvement in preserving Georgia's waters. Although this type of clean-up effort does not directly reduce the level of fecal coliform bacteria in the water, it does bring attention to the issue of water quality. This event should be used to raise awareness of specific pollutants in the water, such as fecal coliform bacteria, and solutions to the pollution problems.

The educational outreach at the Southeastern Natural Sciences Academy's Phinizy Swamp Nature Park is targeted at area teachers and students. The park offers teacher orientation, field trips for students, and other educational opportunities for area citizens. This program could incorporate the fecal coliform problem in Reed Creek into a workshop for school children in Columbia County. This resource is invaluable to the area, and should be utilized appropriately during the implementation phase of this plan.

Recommended Regulatory or Voluntary Actions

Implementation of measures to address the TMDL 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. Through careful land use planning and the use of best management practices, impacts of stormwater runoff can be minimized. Stormwater runoff can be improved through methods like erosion control and the establishment of green spaces, park lands, and stream buffers.

The Columbia County Board of Education should also get involved in the process of reducing fecal coliform bacteria by including educational programs in the curriculums of local schools. The River Kids program (See Appendix E) or a program called Enviroscape (See Appendix F) could be effective if implemented in Columbia County schools. Through these programs, children take water samples and learn how to keep water bodies clean as a part of their regular schoolwork. Introducing water quality issues to children at a young age, and following up with the program through middle school and high school can lead to long-term action and dedication on the part of the citizens of Columbia County.

The expansion of the Adopt-a-Stream program to include the monitoring of Reed Creek could be accomplished through a partnership of the local chapter of the Sierra Club and the already active school system in Columbia County. The formation of this partnership would depend on local interest in water quality and other environmental issues. The local Sierra Club chapter should promote the Adopt-a-Stream program in Columbia County. The local chapter of the club should serve to educate other citizens and officials of Columbia County and arouse further interest in clean water. For effective TMDL compliance, all landowners and land users in the drainage basin must be educated about water quality and the steps necessary to minimize the impacts of stormwater runoff.

Another program to explore for inclusion in the Columbia County school system is the Global Learning and Observation to Benefit the Environment (GLOBE) Program. This program brings together K-12 students, teachers, and scientists from around the world who work together to help us learn more about the environment. This program would be helpful in raising environmental awareness in Columbia County.

The Water Environment Federation (WEF) offers training and an annual WEFTEC conference (See Appendix G). The conference offers training workshops and technical sessions on a wide variety of water quality topics, including TMDL issues, monitoring for water quality, watershed management, and stormwater management. WEF also offers various workshops and sessions throughout the year. These training sessions could be beneficial to city and county officials that deal with water quality issues, as well as teachers who wish to incorporate some environmental aspects into their lessons. Involvement with this organization could bring about awareness of water quality and give county officials tools to implement some strategies to ensure clean water throughout the county.

Columbia County should conduct a septic tank survey to identify those locations with septic tanks in use. Once the locations of the septic tanks are determined, a "Septic to Sewer" incentive program should be implemented to encourage conversion from the use of a septic tank to the use of Columbia County's sewer system. An educational program teaching citizens about the importance of septic tank repair and maintenance could help reduce leaks from septic tanks.

The development of a system to treat stormwater runoff before it enters Reed Creek should be explored. As a part of the Municipal Separate Storm Sewer System (MS4)

Permit, Columbia County is likely to explore the possibility of treating storm water before it enters Reed Creek. This treatment may be in the form of physical structures like ponds or devices installed in the storm water traps to facilitate the fallout of pollution before it enters Reed Creek. The use of any chemicals that may be harmful to wildlife in the area should be avoided.

The Columbia County Water Works Department plans to develop additional proactive measures to ensure that leaks and spills from the sanitary sewer system are prevented. The Water Works Department has a camera system that is used to explore the sewer system to detect any areas the need to be repaired or replaced. Often, roots intrude into the sewer line and this can lead to clogging of the sewer line. The Water Works Department plans to rely on outside contractors to correct the root intrusion problem by treating roots with a foaming agent to physically rot the root in the sewer system. Global Positioning Systems (GPS) will be used to identify the location of the main trunk lines adjacent to the creeks in Columbia County. This will provide a tool for identifying the location of potential problems with the trunk lines as they occur.

Columbia County should adopt the Georgia Stormwater Management Manual as a policy for local development. This manual was developed by the Atlanta Regional Commission to address water quality by addressing BMPs and other development measures. The manual contains three sections: one on policy issues, one on technical and design standards, and one on rules and regulations. This manual, although still in draft form, would be beneficial in regulating stormwater flow in developing areas of the county. Slower stormwater flow results in lower fecal coliform levels.

The Spirit Creek Educational Forest is located in Richmond County. This site trains teachers on monitoring and testing methods for a variety of parameters. The site does not currently have testing equipment for fecal coliform bacteria, but would be willing to obtain the necessary equipment if there was an interest in the community for such a program. The program uses Spirit Creek as a model for hands-on teacher training. The teachers can then carry their knowledge into other streams in the area, and teach students the value of water quality testing and monitoring with hands-on projects.

The National Science Center's Fort Discovery hosts a satellite television program called "Teltrain" that is used in middle school classrooms around the nation (See Appendix H). This program frequently focuses on science issues, and could be used as a vehicle to raise water quality awareness in area schools. This program could be used in conjunction with the River Kids program, the Enviroscape program, Spirit Creek Educational Forest, or other hands-on lessons focusing on water quality.

Schedule for Implementing Management Measures

In order to establish an effective TMDL implementation plan, an implementation schedule must be carefully adhered to. A stakeholder group for the Reed Creek drainage basin has been established and this group has been instrumental in the identification of

potential sources of fecal coliform in the Reed Creek area and in the development of potential measures to reduce or eliminate the excessive levels of fecal coliform present in the creek. A stakeholder group of land owners, business owners, government officials, elected officials, and environmental activists has been formed to help identify the problem and to help implement identified solutions. The list of Stakeholders is attached in Appendix D.

During the first year, this group of stakeholders must actively work together to continue to identify remedial measures and potential funding sources necessary to implement these remedial measures. Initial management controls and best management practices must be established and initial implementation must begin in the first year. Educational programs in the schools and throughout the community must be implemented as soon as possible during the first year of the plan. Monitoring and status reports of any improvement or worsening of the fecal coliform levels must be implemented within the first year. Any illicit discharges must be detected and eliminated as soon as possible.

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 200cfu/100ml May through October and 1000cfu/ 100ml November through April 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 the 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 Reed Creek 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, biannually. 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 Reed Creek 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 identification of sources of fecal coliform bacteria. If a source of the fecal coliform bacteria has not been determined after periodic monitoring, the smaller tributaries to Reed Creek 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.

There has been some discussion about the possibility of the Department of Natural Resources, Environmental Protection Division contributing to the cost of monitoring these impaired water bodies. Further research into possible funding sources should be continually conducted over the five-year implementation period. Additional information and contact information for the funding mentioned above is listed in Appendix I.

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 Reed Creek 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 Reed Creek are below the of 200cfu/100ml May through October and 1000cfu/ 100ml November through April recommended in the TMDL document and the stream is removed from the 303(d) list.

Conclusion

The establishment of an effective TMDL implementation plan is essential to the environmental and economic health of Columbia County. In order for Columbia 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. As stated in the Clean Water Act, if the implementation plan is not efficiently executed, Columbia County could face difficulties in such development as expansion of wastewater treatment facilities and certain industries that could contribute to increased levels of fecal coliform.

The implementation of regulatory and voluntary management measures, coupled with the regular monitoring of Reed Creek, 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 Reed Creek are not at an acceptable level by the end of the fourth year of the plan, a second phase of the implementation plan will be developed.

APPENDIX A
REED CREEK DATA

Date	Above Discharge Fecal Coliform	Below Discharge Fecal Coliform	Mouth of Reed Creek Fecal Coliform	Rainfall in Inches
2-Mar-1999				
3-Mar-1999				
4-Mar-1999	72	29		
9-Mar-1999				0.20
10-Mar-1999				
11-Mar-1999	44	12		
16-Mar-1999				
17-Mar-1999				
18-Mar-1999	120	64		
23-Mar-1999				
24-Mar-1999				
25-Mar-1999	16	6		
Total for Month				2.90
Geometric Mean	50	19		
30-Mar-1999				0.10
31-Mar-1999				0.30
1-Apr-1999	25	2		
6-Apr-1999				
7-Apr-1999				
8-Apr-1999	22	30		
13-Apr-1999				
14-Apr-1999				
15-Apr-1999	2440	46		0.30
20-Apr-1999				
21-Apr-1999				
22-Apr-1999	26	40		
27-Apr-1999				
28-Apr-1999				
29-Apr-1999	16	4		0.30
Total for Month				1.50
Geometric Mean	56	13		

4-May-1999			
5-May-1999			
6-May-1999	32	48	0.85
11-May-1999			
12-May-1999			
13-May-1999	208	20	0.10
18-May-1999			
19-May-1999			
20-May-1999	832	64	
25-May-1999			
26-May-1999			
27-May-1999	1100	60	
Total for Month			1.25
Geometric Mean	279	44	

1-Jun-1999			
2-Jun-1999			0.10
3-Jun-1999	176	6	
8-Jun-1999			
9-Jun-1999			
10-Jun-1999	156	12	
15-Jun-1999			0.35
16-Jun-1999			
17-Jun-1999	880	170	
22-Jun-1999			
23-Jun-1999			
24-Jun-1999	460	8	0.30
Total for Month			5.35
Geometric Mean	325	18	

29-Jun-1999			0.20
30-Jun-1999			
1-Jul-1999	76	80	0.80
6-Jul-1999			
7-Jul-1999			
8-Jul-1999	48	10	
13-Jul-1999			
14-Jul-1999			
15-Jul-1999	2000	264	
20-Jul-1999			
21-Jul-1999			
22-Jul-1999	160	28	
27-Jul-1999			
28-Jul-1999			
29-Jul-1999	2000	24	
Total for Month			6.30
Geometric Mean	298	43	
3-Aug-1999			
4-Aug-1999			
5-Aug-1999	320	2	
10-Aug-1999			
11-Aug-1999			
12-Aug-1999	4	2	
17-Aug-1999			
18-Aug-1999			
19-Aug-1999	42	10	0.04
24-Aug-1999			0.40
25-Aug-1999			
26-Aug-1999	400	1	
Total for Month			2.15
Geometric Mean	68	3	

31-Aug-1999			
1-Sep-1999			
2-Sep-1999	1	10	
7-Sep-1999			
8-Sep-1999			
9-Sep-1999	20	2	0.10
14-Sep-1999			
15-Sep-1999			
16-Sep-1999	480	1	
21-Sep-1999			
22-Sep-1999			
23-Sep-1999	1	1	
28-Sep-1999			0.10
29-Sep-1999			
30-Sep-1999	14	8	
Total for Month			4.50
Geometric Mean	11	3	

5-Oct-1999			
6-Oct-1999			
7-Oct-1999	24	8	
12-Oct-1999			0.80
13-Oct-1999			
14-Oct-1999	14	10	
19-Oct-1999			
20-Oct-1999			
21-Oct-1999	2	1	
26-Oct-1999			
27-Oct-1999			
28-Oct-1999	44	1	
Total for Month			2.55
Geometric Mean	13	3	

2-Nov-1999				
3-Nov-1999				
4-Nov-1999	68	8		
8-Nov-1999				
9-Nov-1999				
10-Nov-1999	1	4		
16-Nov-1999				
17-Nov-1999				
18-Nov-1999	10	6		
22-Nov-1999				
23-Nov-1999				
24-Nov-1999	2	1		
Total for Month				1.60
Geometric Mean	6	4		
30-Nov-1999				
1-Dec-1999				
2-Dec-1999	2	2		
7-Dec-1999				
8-Dec-1999				
9-Dec-1999	14	14	1	
14-Dec-1999				
15-Dec-1999				
16-Dec-1999	14	1	16	
19-Dec-1999				0.05
20-Dec-1999				
21-Dec-1999	22	16	6	0.55
28-Dec-1999				
29-Dec-1999				
30-Dec-1999	6	10	98	
Total for Month				1.45
Geometric Mean	9	5	10	

4-Jan-2000				0.20
5-Jan-2000				
6-Jan-2000	18	1	122	
11-Jan-2000				
12-Jan-2000				
13-Jan-2000	210	280	122	
18-Jan-2000				0.05
19-Jan-2000				0.60
20-Jan-2000	8	2	18	
25-Jan-2000				
26-Jan-2000				
27-Jan-2000	430	62	510	
Total for Month				7.40
Geometric Mean	60	14	108	

1-Feb-2000				
2-Feb-2000				
3-Feb-2000	48	52	52	
7-Feb-2000				
8-Feb-2000				
9-Feb-2000	96	12	18	
15-Feb-2000				
16-Feb-2000				
17-Feb-2000	124	56	72	
22-Feb-2000				
23-Feb-2000				
24-Feb-2000	2	36	4	
Total for Month				0.90
Geometric Mean	33	33	23	

29-Feb-2000				
1-Mar-2000				
2-Mar-2000	2	2	4	
7-Mar-2000				
8-Mar-2000				
9-Mar-2000	112	56	24	
14-Mar-2000				
15-Mar-2000				
16-Mar-2000	8	20	8	0.30
21-Mar-2000				
22-Mar-2000				
23-Mar-2000	96	56	28	
28-Mar-2000				
29-Mar-2000				
30-Mar-2000	14	86	4	
Total for Month				3.20
Geometric Mean	19	26	10	
4-Apr-2000				
5-Apr-2000				
6-Apr-2000	4	1	1	
11-Apr-2000				
12-Apr-2000				
13-Apr-2000	52	2	30	
17-Apr-2000				
18-Apr-2000				
19-Apr-2000	2	8	24	
25-Apr-2000				
26-Apr-2000				
27-Apr-2000	44	1	1	
Total for Month				0.95
Geometric Mean	12	2	5	

2-May-2000				
3-May-2000				
4-May-2000	10	10	10	
9-May-2000				
10-May-2000				
11-May-2000	13	1	12	
16-May-2000				
17-May-2000				
18-May-2000	14	1	28	
23-May-2000				
24-May-2000				
25-May-2000	50	14	26	
Total for Month				0.05
Geometric Mean	17	3	17	
30-May-2000				
31-May-2000				
1-Jun-2000	100	60	210	
6-Jun-2000				
7-Jun-2000				
8-Jun-2000	36	6	174	
13-Jun-2000				
14-Jun-2000				
15-Jun-2000	50	1	6	0.30
20-Jun-2000				3.50
21-Jun-2000				0.25
22-Jun-2000				0.70
27-Jun-2000				0.25
28-Jun-2000				
29-Jun-2000	1400	570	20	0.80
Total for Month				6.50
Geometric Mean	126	21	46	

4-Jul-2000				
5-Jul-2000				
6-Jul-2000	910	320	200	0.05
11-Jul-2000				0.05
12-Jul-2000				
13-Jul-2000	150	1020	170	
18-Jul-2000				
19-Jul-2000				
20-Jul-2000	40	10	110	
25-Jul-2000				
26-Jul-2000				
27-Jul-2000	10	10	40	
Total for Month				2.65
Geometric Mean	86	76	111	

1-Aug-2000				3.60
2-Aug-2000				0.40
3-Aug-2000	7200	520	420	1.80
8-Aug-2000				
9-Aug-2000				
10-Aug-2000	1	1	50	
15-Aug-2000				
16-Aug-2000				
17-Aug-2000	30	5200	910	
22-Aug-2000				
23-Aug-2000				
24-Aug-2000	1500	10	50	1.00
29-Aug-2000				
30-Aug-2000				0.50
31-Aug-2000	1670	470	1500	
Total for Month				9.35
Geometric Mean	222	105	270	

5-Sep-2000				0.15
6-Sep-2000				0.30
7-Sep-2000	120		180	
12-Sep-2000				
13-Sep-2000				
14-Sep-2000	3	1	50	
19-Sep-2000				
20-Sep-2000				0.05
21-Sep-2000	680	110	200	0.48
26-Sep-2000				
27-Sep-2000				
28-Sep-2000	30	90	20	
Total for Month				9.28
Geometric Mean	52	21	77	

3-Oct-2000				
4-Oct-2000				
5-Oct-2000	10	1	20	
10-Oct-2000				
11-Oct-2000				
12-Oct-2000	10	1	20	
17-Oct-2000				
18-Oct-2000				
19-Oct-2000	10	16	10	
24-Oct-2000				
25-Oct-2000				
26-Oct-2000	1	10	1	
Total for Month				0.05
Geometric Mean	6	4	8	

31-Oct-2000				
1-Nov-2000				
2-Nov-2000	10	20	1	
6-Nov-2000				
7-Nov-2000				
8-Nov-2000	1	30	1	
14-Nov-2000				
15-Nov-2000				
16-Nov-2000	190	30	1	0.25
19-Nov-2000				
20-Nov-2000				
21-Nov-2000	1370	450	44	
28-Nov-2000				
29-Nov-2000				
30-Nov-2000	30	10	1	
Total for Month				3.80
Geometric Mean	38	38	2	
5-Dec-2000				
6-Dec-2000				
7-Dec-2000	1	1	1	
12-Dec-2000				
13-Dec-2000				
14-Dec-2000	40	1	10	
19-Dec-2000				0.10
20-Dec-2000				
21-Dec-2000	100	140	1	
26-Dec-2000				
27-Dec-2000				0.20
28-Dec-2000	1	1	10	
Total for Month				1.45
Geometric Mean	8	3	3	

2-Jan-2001				
3-Jan-2001				
4-Jan-2001	2	1	25	
9-Jan-2001				
10-Jan-2001				
11-Jan-2001	30	12	44	0.60
16-Jan-2001				
17-Jan-2001				
18-Jan-2001	14	6	58	
23-Jan-2001				
24-Jan-2001				
25-Jan-2001	28	22	76	
Total for Month				2.55
Geometric Mean	12	6	47	

30-Jan-2001				
31-Jan-2001				
1-Feb-2001	2	16	22	
6-Feb-2001				
7-Feb-2001				
8-Feb-2001	8	8	10	
12-Feb-2001				0.10
13-Feb-2001				
14-Feb-2001	14	6	62	
20-Feb-2001				
21-Feb-2001				0.50
22-Feb-2001	1	16	650	1.10
Total for Month				2.65
Geometric Mean	4	11	55	

27-Feb-2001				
28-Feb-2001				
1-Mar-2001	16	6	22	
6-Mar-2001				
7-Mar-2001				
8-Mar-2001	120	104	22	
13-Mar-2001				
14-Mar-2001				1.30
15-Mar-2001	154	324	196	0.40
20-Mar-2001				0.65
21-Mar-2001				
22-Mar-2001	704	922	558	
27-Mar-2001				
28-Mar-2001				0.25
29-Mar-2001	24	42	62	
Total for Month				6.55
Geometric Mean	87	95	80	
2-Apr-2001				
3-Apr-2001				0.20
4-Apr-2001	14	12	22	
10-Apr-2001				
11-Apr-2001				
12-Apr-2001	38	34	52	
17-Apr-2001				
18-Apr-2001				
19-Apr-2001	14	1	16	
23-Apr-2001				
24-Apr-2001				
25-Apr-2001	132	8	108	0.40
Total for Month				1.00
Geometric Mean	31	8	37	

1-May-2001				
2-May-2001				
3-May-2001	52	4	126	
8-May-2001				
9-May-2001				
10-May-2001	56	956	334	
15-May-2001				
16-May-2001				
17-May-2001	44	48	86	
22-May-2001				0.40
23-May-2001				
24-May-2001	34	82	88	
29-May-2001				0.05
30-May-2001				
31-May-2001	1250	1600	520	0.30
Total for Month				4.90
Geometric Mean	89	119	175	
5-Jun-2001				
6-Jun-2001				0.10
7-Jun-2001	60	10	980	0.10
12-Jun-2001				3.40
13-Jun-2001				1.30
14-Jun-2001	6100	4300	6200	
19-Jun-2001				
20-Jun-2001				
21-Jun-2001	62	36	50	
26-Jun-2001				
27-Jun-2001				0.03
28-Jun-2001	288	74	84	0.03
Total for Month				7.56
Geometric Mean	284	103	400	

3-Jul-2001				
4-Jul-2001				
5-Jul-2001	374	126	96	
10-Jul-2001				
11-Jul-2001				
12-Jul-2001	30	442	796	
17-Jul-2001				
18-Jul-2001				
19-Jul-2001	158	456	122	
24-Jul-2001				
25-Jul-2001				0.20
26-Jul-2001	182	212		
Total for Month				1.60
Geometric Mean	134	271	210	

31-Jul-2001				
1-Aug-2001				
2-Aug-2001	6	18	250	
7-Aug-2001				
8-Aug-2001				
9-Aug-2001	96	16	132	
14-Aug-2001				
15-Aug-2001				
16-Aug-2001	74	568	168	
20-Aug-2001				
21-Aug-2001				
22-Aug-2001	3200	414	96	
26-Aug-2001				
27-Aug-2001				
28-Aug-2001	96	558	420	
Total for Month				1.85
Geometric Mean	106	130	186	

APPENDIX B
TMDL DOCUMENT

TOTAL MAXIMUM DAILY LOAD (TMDL) DEVELOPMENT

For FECAL COLIFORM in the

REED CREEK WATERSHED

(HUC 03060106)

Columbia County, Reed Creek, Georgia

EPA United States Environmental Protection Agency

Region 4 serving the southeast

APPROVAL PAGE

for FECAL COLIFORM in

Reed Creek, GA

Georgia's final 1998 303(d) list identified Reed Creek near Augusta, GA as not supporting its designated use for fishing, with the pollutant of concern being fecal coliform. This total maximum daily load (TMDL) is being established pursuant to the 1998 Georgia 303(d) list and the Consent Decree in the Georgia TMDL Lawsuit.

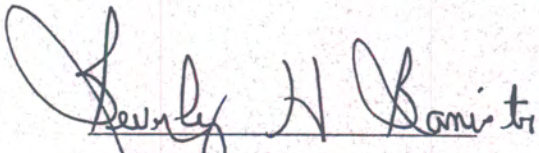
The load allocation for Reed Creek is based on the low flow value and the background concentration of fecal coliform in the stream. Low flow in Reed Creek is assumed to be 0.042 cubic meters per second (USGS, 1988). The background concentration of fecal coliform in Reed Creek is assumed to be 20 counts/100ml. This concentration is based on the background levels in other streams in the basin.

The Total Maximum Daily load for Reed Creek for fecal coliform is given below:

Pollutant	**TMDL (counts/day)**	**WLA (counts/day)**	**LA (counts/day)**	**MOS**
Fecal Coliform	4.41×10^{10}	4.34×10^{10}	7.34×10^{8}	Implicit

The Fecal Coliform TMDL for Reed Creek is 4.41×10^{10} counts/day. This accounts for a maximum load from the Reed Creek Water Pollution Control Plant and natural background conditions.

APPROVED BY:



Robert F. McGhee, Director
Water Management Division
EPA-Region 4

3/7/00
Date

Table of Contents

Introduction 1

Problem Definition 1

Target Identification 2

Background 2

Numeric Targets and Sources - Model Development 3

Critical Condition Determination 3

Total Maximum Daily Load (TMDL) 3

Margin of Safety 3

TMDL Calculation 4

Seasonal Variation 5

Allocation of Responsibility and Recommendations 5

References: 6

Appendix A: Water Quality Data at Station 01009051 7

Appendix B: Location Map 8

Appendix C: Units Conversion Table 9

Administrative Record Index 10

Response to Public Comment on Proposed TMDL 11

Introduction

Section 303(d) of the Clean Water Act (CWA) as Amended by the Water Quality Act of 1987, Public Law 100-4, and the United States Environmental Protection Agency's (USEPA/EPA) Water Quality Planning and Management Regulations [Title 40 of the Code of Federal Regulation (40 CFR), Part 130] require each State to identify those waters within its boundaries not meeting water quality standards applicable to the waters' designated uses. Total maximum daily loads (TMDLs) for all pollutants violating or causing violation of applicable water quality standards are established for each identified water. Such loads are established at levels necessary to implement the applicable water quality standards with consideration given to seasonal variations and margins of safety. The TMDL process establishes the allowable loadings of pollutants or other quantifiable parameters for a water body, based on the relationship between pollution sources and in-stream water quality conditions, so that states can establish water-quality based controls to reduce pollution from both point and nonpoint sources and restore and maintain the quality of their water resources (USEPA, 1991a).

Problem Definition

Georgia's final 1998 Section 303(d) list identified 1 mile of Reed Creek in Columbia County as not supporting its designated use for fishing, with the pollutant of concern being Fecal Coliform. This listing decision was based on limited data collected at water quality station 01009051.

The TMDL is being established pursuant to EPA commitments in the October 1997 Consent Decree in the Georgia TMDL lawsuit (Sierra Club v. EPA & Hankinson, 1998). These conditions include a requirement that TMDLs be proposed by August 30, 1999, for each water on the 1998 303(d) list that is impacted by a National Pollutant Discharge Elimination System (NPDES) permitted point source or point sources, and is located in the Savannah/Ogeechee Basins.

Target Identification

The target level for the development of the Fecal Coliform TMDL in Reed Creek is the numeric criterion established in Georgia's Rules and Regulations for Water Quality Control, Chapter 391-3-6, Revised July 6, 1999. The regulation establishes the freshwater criteria for Fecal Coliform expressed in terms of a geometric mean concentration of no more than 200 counts/100 ml for the months of May through October and 1,000 counts/100 ml for the months of November through April.

Background

The segment that is impaired is 1 mile in Columbia County. This segment of Reed Creek is on the State of Georgia's §303 (d) list for violating the total fecal coliform standard for the State of Georgia. The State of Georgia collects water quality data on Reed Creek at State Route 28 near Martinez, Georgia (please see Appendix A). A review of the limited data collected at this station indicates two violations during the months May through October 1997 and five violations during the months November through April 1997.

The only point source on Reed Creek is the Columbia County Reed Creek Water Pollution Control Plant (WPCP). The Reed Creek WPCP is downstream of the monitoring station. The facility is currently operating at end-of-pipe criteria. A suspected source of the fecal coliform contamination is failures in the sewer collection systems. Other contributing sources of contamination could be non-point source urban runoff.

A dam is located in Reed Creek downstream of the WPCP facility and is used to create the effluent pond for the facility. Flow in Reed Creek downstream of the facility is discharged from the effluent pond. The facility is permitted to discharge 0.25 cms (5.75 MGD) to Reed Creek.

Numeric Targets and Sources - Model Development

A steady-state water quality model provides predictions for only a single set of environmental conditions. For NPDES permitting purposes, steady-state models are applied for "critical" environmental conditions that represent conditions when the assimilative capacity of a waterbody is very low. For discharges to riverine systems, critical environmental conditions correspond to drought upstream flows. The assumption behind steady-state modeling is that permit limits that protect water quality during critical conditions will be protective for the large majority of environmental conditions that occur. This TMDL does not consider the impacts of non-point source loadings of fecal coliform due to wet weather events when the assimilative capacity of a waterbody is greater.

Critical Condition Determination

The most critical condition for Reed Creek will be used to determine the TMDL. Fecal coliform will be considered a conservative substance in the TMDL calculation. The influence on the instream fecal coliform concentration will be river flow. For Reed Creek, the critical flow will be considered 0.042 cms.

Total Maximum Daily Load (TMDL)

The TMDL is the total amount of pollutant that can be assimilated by the receiving water body while achieving water quality standards. The components of the TMDL are the Wasteload Allocation (WLA) and the Load Allocation (LA) and the TMDL must take into consideration a Margin of Safety and seasonality. The WLA is the pollutant allocation to point sources while the LA is the pollutant allocation to natural background and nonpoint sources.

Margin of Safety

The margin of safety (MOS) is part of the TMDL development process. There are two basic methods for incorporating the MOS (USEPA, 1991a):

- Implicitly incorporating the MOS using conservative model assumptions to develop allocations, or
- Explicitly specifying a portion of the total TMDL as the MOS; using the remainder for allocations.

The MOS is incorporated implicitly into this modeling process by selecting the critical low flow based on 20 years of flow data.

TMDL Calculation

The TMDL calculation will utilize the conservation of mass principle, where the load can be calculated by using the following relationship:

Concentration = Load / Flow

Rearranging this equation the maximum load can be calculated as follows:

Load = Concentration (Water Quality Standard) * Flow

The load allocation for Reed Creek is based on the low flow value and the background concentration of fecal coliform in the stream. Low flow in Reed Creek is assumed to be 0.042 cms (USGS, 1988). The background concentration of fecal coliform in Reed Creek is assumed to be 20 counts/100ml. This concentration is based on the background levels in other streams in the basin. The resulting load allocation for Reed Creek is 7.34×10^8 counts/day.

The Total Maximum Daily load for Reed Creek for fecal coliform is given in Table 1.

Table 1 TMDL Calculation and Waste Load Allocation

Pollutant	TMDL (counts/day)	WLA (counts/day)	LA (counts/day)	MOS
Fecal Coliform	4.41×10^{10}	4.34×10^{10}	7.34×10^8	Implicit

The Fecal Coliform TMDL for Reed Creek is 4.41×10^{10} counts/day. This accounts for a maximum load from the Reed Creek WPCP and natural background conditions.

Seasonal Variation

The permitted discharge condition represents the most critical design condition and will provide year round protection. There are no seasonal variations that impact the concentration of fecal coliform in the river due to biological activities.

Allocation of Responsibility and Recommendations

The allocation for fecal coliform to Reed Creek is given in Table 1. For a potential future point or nonpoint source of fecal coliform loading introduced into the system, the total of the WLA (wasteload allocations for point source loadings) and LA (load allocation for nonpoint source loadings) shall not exceed this TMDL.

References:

USEPA. 1991a. *Guidance for Water Quality –based Decisions: The TMDL Process.* U.S. Environmental Protection Agency, Office of Water, Washington, DC. EPA-440/4-91-001, April 1991.

USEPA. 1998. *Better Assessment Science Integrating Point and Nonpoint Sources, BASINS, Version 2.0 User's Manual.* U.S. Environmental Protection Agency, Office of Water, Washington, DC. EPA-823-B-98-006, November 1998.

Georgia Department of Natural Resources, Environmental Protection Division. 1998. *Rules and Regulations for Water Quality Control, Chapter 391-3-6-.03, Water Use Classifications and Water Quality Standards*, July 1999 .

Sierra Club v. EPA & Hankinson. 1998. USDC-ND-GA Atlanta Div. #1: 94-CV-2501-MHS.

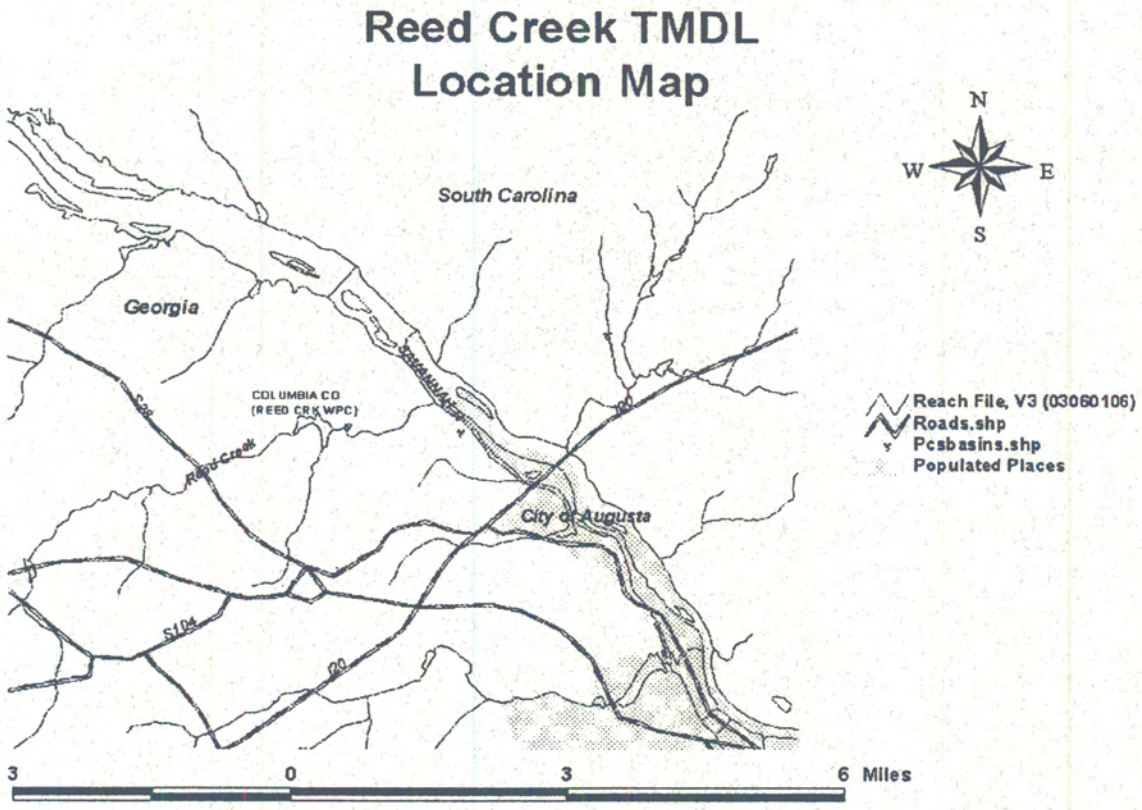
USGS. 1988. *Low-Flow Profiles of the Upper Savannah and Ogeechee Rivers and Tributaries in Georgia.* R.F. Carter, E.H. Hopkins, and H.A. Perlman, Water Resources Investigations Report 88-4047.

Appendix A: Water Quality Data at Station 01009051

```
01009051        02196488
                   STORET System
33 32 19.3 082 04 48.7  4
REED CK AT SR 28 NR MARTINEZ
13073 GEORGIA           COLUMBIA
SOUTHEAST                 031300
SAVANNAH
21GAEPD  03060106                    /TYPA/AMBNT/STREAM
        970208     DEPTH    0
```

DATE FROM TO	TIME OF DAY	DEPTH FEET	31615 FEC COLI MPNECMED /100ML
97/02/03	0730	0	330
97/02/20	0630	0	170
97/03/20	0650	0	230
97/04/17	0600	0	490
97/05/22	0620	0	790
97/06/19	0530	0	490
97/07/23	0530	0	88500
97/08/21	0530	0	170000
97/09/18	0530	0	790
97/10/16	0600	0	13000
97/11/06	0630	0	490
97/12/04	0630	0	490

Appendix B: Location Map



Appendix C: Units Conversion Table

From	To	Multiply by:
Million Gallons per Day (MGD)	Cubic Meters per Second (cms)	0.04381
Cubic Feet per Second (cfs)	Cubic Meters per Second (cms)	0.02832
Pounds (lbs)	Kilograms (Kg)	0.4536
Tons (Short)	Kilograms (Kg)	907.1848
Tons (Long)	Kilograms (Kg)	1016.00

Administrative Record Index

1. Columbia County, Georgia, Water Pollution Control Plant NPDES Permit No. GA0031992.
2. Compilation of Georgia's Current Modeling Guidelines for the Development of Wasteload Allocations and NPDES Permit Limitations. January 1991
3. Georgia Department of Natural Resources, Environmental Protection Division, Rules and Regulations for Water Quality Control, Chapter 391-3-6-.03, Water Use Classifications and Water Quality Standards
4. Shivalingaiah, B. and James, W. (June 1984) Algorithms for buildup washoff and routing pollutants in urban runoff., Proceedings of 3rd International Conference on Urban Storm Drainage, Goteborg Sweden, pp. 1445-1456., Reference No. I3147
5. USGS. 1988. *Low-Flow Profiles of the Upper Savannah and Ogeechee Rivers and Tributaries in Georgia*. R.F. Carter, E.H. Hopkins, and H.A. Perlman, Water Resources Investigations Report 88-4047.
6. STORET Water Quality Data
7. Stored on TMDL Shared drive m:/apps32/tmdl/reed STORET Water Quality Data
8. Stored on TMDL Shared drive m:/apps32/tmdl/reed Excel Spreadsheet to calculate fecal coliform concentration
9. Stored on TMDL Shared drive m:/apps32/tmdl/reed Proposed TMDL Report

Response to Public Comment on Proposed TMDL

COMMENT

The wasteload allocation to the Columbia County Water Pollution Control Plant should bear the full burden of pollutant reduction (no load allocation) because it is a controllable source and the load allocation is not controllable.

Mr. Eric E. Huber, EarthJustice Legal Defense Fund, 400 Magazine Street, Suite 401, New Orleans, Louisiana 70130-2453, December 7, 1999

RESPONSE

The LA portion of the TMDL represents background conditions in Reed Creek. The Reed Creek WPCP is currently operating at end-of-pipe criteria.

COMMENT

The TMDLs were calculated using mass balance techniques. Commenters do not believe that the mass balance technique addresses the complexity of the sampling and potential elevated background loading associated with fecal coliform.

Mr. Michael E. Wilder, Water Resources Workgroup Chair, and Mr. James R. Baker, Chair, Georgia Industry Environmental Coalition, 112 Town Park Drive, Kennesaw, Georgia 30144, December 14, 1999

RESPONSE

Comment noted.

COMMENT

The low flow scenario is not the only water quality limited situation for this water. It is not legally or technically acceptable for a TMDL to fail to address all pertinent critical flow scenarios. Failure to address high flow scenarios at this time will allow the most serious fecal problems to go unaddressed for a long time.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

RESPONSE

The low flow scenario represents critical conditions. Load allocations established for this period will provide an added margin of safety during high flow scenarios.

COMMENT

EPA needs to justify its intention to set a TMDL at low flow and to use that as a margin of safety. There must be some accounting of nonpoint loads of fecal. The evident desire of EPA to split fecal into two separate TMDLs in order to address high flow TMDL considerations at a later time is not an appropriate approach and it fails to adequately address the required seasonal variation component of a TMDL.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

RESPONSE

The Georgia TMDL Lawsuit consent decree required that TMDLs be developed for waterbodies impacted by NPDES permitted point sources only. There is insufficient data collected on Reed Creek for wet weather analysis, therefore this TMDL did not address wet weather issues.

COMMENT

Fecal problems occur mostly at higher flows from nonpoint sources, from sewer leaks/overflows, as well as from some permitted discharges. A standard protocol is needed for addressing typical fecal TMDLs where site specific models are not available.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

RESPONSE

The Georgia TMDL Lawsuit consent decree required that TMDLs be developed for waterbodies impacted by NPDES permitted point sources only. There is insufficient data collected on Reed Creek for wet weather analysis, therefore this TMDL did not address wet weather issues. In general, geometric means of fecal coliform concentrations are higher in the summer dry months than corresponding annual or winter wet weather geometric mean concentrations. This is due to a rate of dilution by high, wet weather discharge that exceeds the subsequent increase in fecal coliform loading.

COMMENT

EPA guidance requires that, where nonpoint sources cannot be reduced through enforceable controls, the reduction burden must be placed on permitted sources. The TMDL has applied the standard to the end of the pipe with an expectation that any necessary reductions would come from unregulated, uncontrolled, or unknown nonpoint sources. In the TMDL, the WLA for the point sources should be established at a lower level than the in-stream standard before there can be any contention that EPA has incorporated any MOS. This is especially true because the TMDL only addresses the low flow situation where there would be zero MOS.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

RESPONSE

The Georgia TMDL Lawsuit consent decree required that TMDLs be developed for waterbodies impacted by NPDES permitted point sources only. There is insufficient data collected on Reed Creek for wet weather analysis, therefore this TMDL did not address wet weather issues. The margin of safety incorporated in the TMDL includes a background concentration of fecal coliform bacteria of 20 counts/100ml.

COMMENT

The TMDL addresses only the single criterion of 200/100 ml geometric mean. There are other criterion in the regulations. If EPA contends that its reference to the single criterion is sufficient to address all other regulatory standards, this needs to be stated, explained, and supported.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

RESPONSE

The TMDL based on the single criterion of 200 counts/100ml reflects critical conditions. Using this approach, the TMDL provides reasonable assurance that other water quality standards can be met under various flow conditions.

COMMENT

No Appendix A is included as stated on page 2.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

RESPONSE

Appendix A contains water quality data collected on Reed Creek at State Route 28 near Martinez, Georgia. This appendix is included in the final TMDL.

COMMENT

On page 2, there is mention of a dam on the creek to create the effluent pond. What is meant by an effluent pond, and what is the purpose ? Is there in-stream treatment or a mixing zone approval ? This also suggests that this is a flow regulated stream and 7Q10 may not apply.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

RESPONSE

The dam on Reed Creek is used to create a pond for storing effluent before it is discharged downstream. The purpose of the pond is for controlling the rate of discharge to Reed Creek. The WPCP facility is required to meet end-of-pipe criterion for fecal coliform bacteria and there is no in-stream treatment for fecal coliform. The dam is located upstream of the impaired segment and other drainage areas flow into Reed Creek below the dam. The 7Q10 flow on Reed Creek is assumed to be 0.042 cms (1.5 cfs) whereas the permitted discharge from the WPCP facility is 0.25 cms (8.86 cfs). A more conservative TMDL is obtained using the 7Q10 flow rate.

COMMENT

The flow from the STP is 8.86 cfs and the low flow of the stream is 1.5 cfs. This indicates that the stream should be listed as WQLS for other parameters also.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

RESPONSE

The comment concerns a § 303(d) listing issue and is not directly relevant to the matter of the public opportunity for comment on numerous proposed TMDLs for waters and pollutants in the State of Georgia.

It is recommended that the commenter provide his written comments, along with supporting data and information, to the Georgia EPD for consideration in the development of the 2000 303(d) list.

COMMENT

It is stated on page 3 that nonpoint loadings are not considered but Table 1 shows a LA value. This is inconsistent. It is also stated that at higher flows there is greater assimilative capacity, but that would not be the case if runoff contained high fecal, thus yielding less capacity if the stream exceeded standards. At low flow, the background is assumed to be 20/100 ml allowing for some dilution, but this may not be the case at higher flows when it appears that stream standards have been exceeded.

Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

RESPONSE

The LA portion of the TMDL is the pollutant allocation to natural background and non-point sources. Insufficient data are available for wet weather analysis to evaluate the impact of non-point source loadings of fecal coliform. In Table 1, the LA value represents background conditions.

COMMENT

Why is the background of 20/100 ml used in this TMDL different from other TMDLs ?

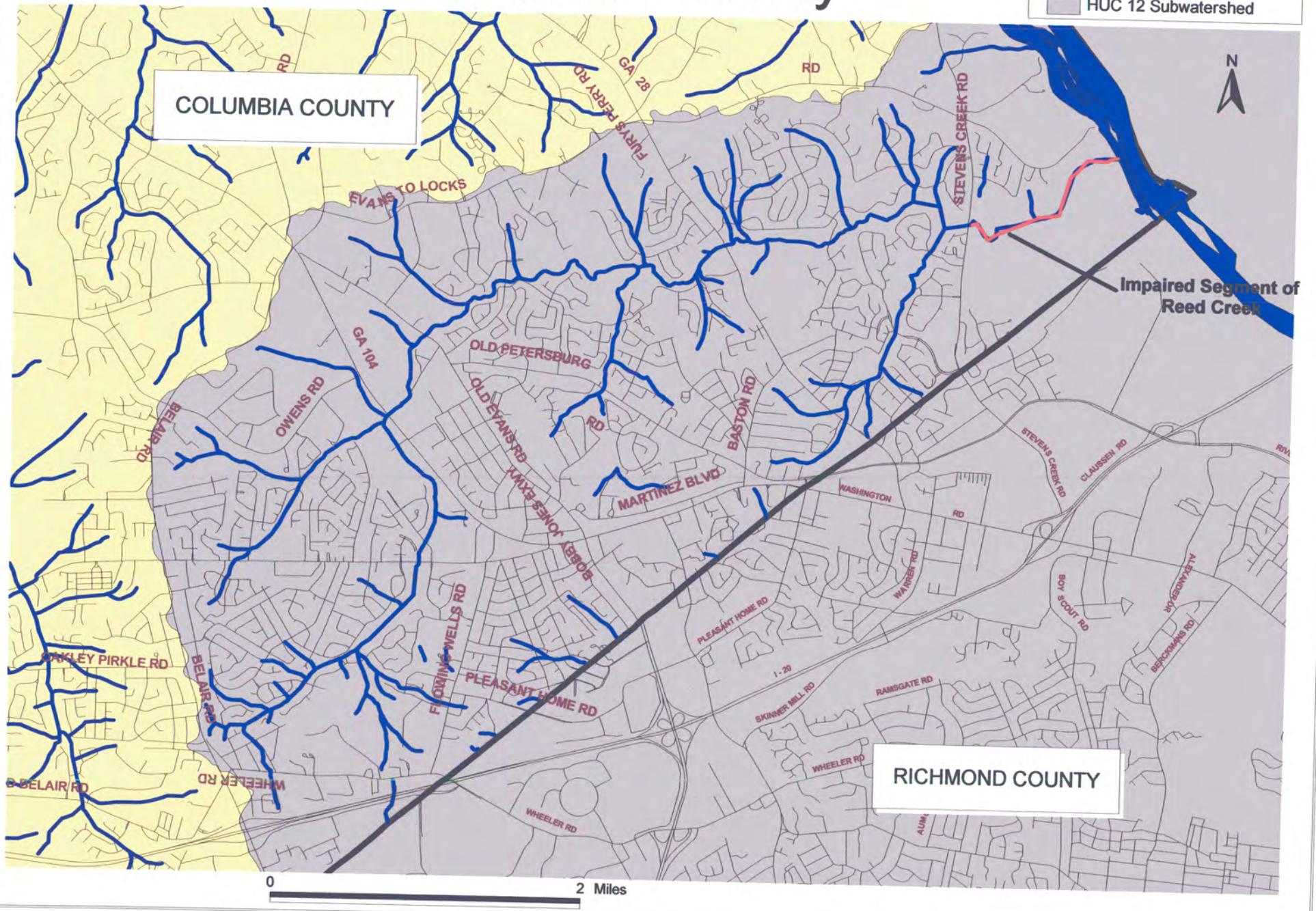
Mr. Douglas P. Haines, Executive Director, Georgia Legal Watch, 264 North Jackson Street, Athens, Georgia 30601, December 22, 1999

RESPONSE

The background concentration of 20 counts/100ml is an assumed value and is consistent with other fecal coliform bacteria TMDLs developed by EPA.

APPENDIX C
REED CREEK LOCATION MAP

Reed Creek in Columbia County



APPENDIX D
STAKEHOLDER LIST

Mr. Srinivas Jalla
5390 Triangle Pkwy, #100
Augusta, GA 30809

Mr. Oliver Owens
3535 Pebble Beach Drive
Augusta, GA 30907

Mr. Nathan Youngblood
3683 Wheeler Road
Augusta, GA 30909

Mr. Glenn Atkinson
International Paper
4231 Mike Padgett Hwy.
Augusta, GA 30907

Mr. and Mrs. Alan Moore
3133 West Lake Forest Drive
Augusta, GA 30909

Mr. Paul Decamp
525 Telfair Street
Augusta, GA 30901

Dr. Hameed Malik
Room 701- Municipal Bldg.
530 Greene Street
Augusta, GA 30911

Ms. Wendy Lowenthal
6343 Columbia Road
Appling, GA 30802

Ms. Cathy Black
4052 Smokey Road
Augusta, GA 30815

Ms. Zulakha Ahmad
630 Ronald Reagan Drive
Evans, GA 30809

Mr. Frank Carl
14501 Smith Road
Charlotte, NC 28273

Mr. George Patty
525 Telfair Street
Augusta, GA 30901

Mr. C. J. Singleton
3731 West Lake Drive
Augusta, GA 30907

Mr. Allen Saxon
Augusta Utilities
360 Bay Street
Augusta, GA 30901

Mr. David Simoneau
1233 Augusta W. Pkwy
Augusta, GA 30909

Mr. Max Hicks
Augusta Utilities Department
360 Bay Street, Suite 180
Augusta, GA 30901

Ms. Acetra McWilliams
2692 Sharon Road
Washington, GA 30673

Mr. Ted Jovanis
IFF
P. O. Box 250
Augusta, GA 30903

Mr. and Mrs. Richard Leopard
1184 Dogwood Drive
Lincolnton, GA 30817

Mr. W. J. Townsend
2515 Tobacco Road
Augusta, GA 30906

Mr. Richard Barrett
2029 Lumpkin Road
Augusta, GA 30906

Mr. Matthew Gibbs
1130 Maple Ridge Drive
Evans, GA 30809

Mr. Sam Booher
4387 Roswell Drive
Augusta, GA 30907

Mr. Buford Sanders
1465 Tignall Road
Washington, GA 30673

Mr. Jim Bartley
P. O. Box 457
Evans, GA 30809

Mr. Fred Geurant
McDuffie County Planning Comission
P. O. Box 7
Thomson, GA 30824

Ms. Colleen Cunningham
3730 Chamblee Tucker Rd.
Atlanta, GA 30341

Ms. Maggie Kelly
Georgia PIRG
1447 Peachtree St.
Suite 304
Atlanta, GA 30309

Mr. Glenn Atkinson
International Paper
4231 Mike Padgett Highway
Augusta, GA 30906

Mr. Don Rhodes
City of Louisville
PO Box 527
Louisville, GA 30434

Mr. John Colberg
Georgia Forestry Commission
2088 Warrenton Hwy.
Thomson, GA 30824

Mr. Greg Kist
CSRA Resource Conservation & Development
3456 D Peach Orchard Road
August, GA 30906

Mr. David Ferrell
USDA NRCS
Federal Building, Room 214
601 Tebeau Street
Waycross, GA 31502

Mr. Charles Phillips
Columbia County Cooperative Extension Agency
3300 B Evans To Locks Rd. - Savannah Rapids
Martinez, GA 30907

Mr. Ray Hicks
Cooperative Extension Service
321 Rocky Ford Road
Sylvania, GA 30467

Mr. Drew Goins
Augusta Utilities
360 Bay Street, Suite 180
Augusta, GA 30901

Mr. Drew Marczak
The Timber Company
PO Box 1069
Watkinsville, GA 30677

Ms. Karen Austin
GA Sierra Club
1447 Peachtree St.
Suite 305
Atlanta, GA 30309

Mr. Sam Booher
4387 Roswell Dr.
Martinez, GA 30907

Mr. Jim Leiper
Columbia County Engineering & Environmental Services
P O Box 498
630 Ronald Reagan Dr.
Evans, GA 30809

Mr. Willard Fell
Georgia Forestry Commission
18899 U.S. Hwy. 301 N.
Statesboro, GA 30458

Mr. Earl Brantley
USDA NRCS
Area 2 Office Stop #211
355 East Hancock Ave.
Athens, GA 30601

Ms. Wendy Lowenthal
Columbia County Water & Soil Conservation District
6343 Columbia Rd.
Appling, GA 30802

Mr. Austin Blackburn
USDA Soil Conservation
216 Mims Road
Sylvania, GA 30467

Mr. Max Hicks
Augusta Utilities
360 Bay Street, Suite 180
Augusta, GA 30901

Mr. Alan Saxon
Augusta Utilities
360 Bay Street, Suite 180
Augusta, GA 30901

Dr. Hameed Malik
Public Works – Engineering
530 Green St., Room 701
Augusta, GA 30901

Commissioner Barry Fleming
Columbia County Commission
170 West Forrest Street
Harlem, GA 30814

Commissioner Diane Ford
Columbia County Commission
946 Windmill Lane
Evans, GA 30809

Commissioner Frank Spears
Columbia County Commission
540 McKinne's Lane
Evans, GA 30809

Chairman George Grimaud, Jr.
Wilkes County Commission
23 Court Street, Rm. 222
Wasington, GA 30673-1593

Chairman Walker Norman
Lincoln County Commission
PO Box 340
Lincolnton, GA 30817

Mr. Lamar Hamill
McDuffie County
PO Box 28
Thomson, GA 30824

APPENDIX E
RIVER KIDS PROGRAM

River Kids' Network

The River Kids' Network is an interdisciplinary river awareness project developed by third grade teacher, Dee Shore. The project focuses on the water quality of Georgia's waterways especially the Chattahoochee River and its tributaries. This environmental project is designed for grades 3-8.

It was piloted in the '94-95 school year with 3 Columbus elementary schools and one middle school. There were twelve schools with approximately 600 River Kids registered during the '96-97 school year. The 1997-98 project has 18 schools enrolled.

The goals of the project are to help students develop a sense of pride, awareness, and appreciation for their environment; understand the interdependence between animals and their environment; and realize that they can help save our most precious natural resource, water.

We would like to expand the project to include schools along tributaries of the Chattahoochee River and other waterways in Georgia. We are also accepting applications outside Georgia. If you are interested in joining this award-winning project, please contact Dee Shore, Project Coordinator at Clubview Elementary School.

If you would like to contact Dee Shore please feel free to E-mail her at

deeshore@aol.com

Back to Our Homepage

The ETTC is a part of the State Data and Research Center

Augusta

Up

Stream Data

National Science Center's Fort Discovery

State of Georgia 1776

Grovetown Elementary Student tests for dissolved oxygen.

Article, Augusta Chronicle - Peggy Ussery

This five year project with an Grovetown Elementary School, Harlem Middle School, Greenbrier High School, and Baker Road Landfill in Columbia County is designed to provide students and teachers with technology-rich, real-world work. Students using Georgia's Adopt-a-Stream protocol will monitor Euchee Creek in a fast growing area of Columbia County. Ginny Brady is the project leader for this project (706-821-0632)

We would like to give a big thanks to Metro Augusta Clean & Beautiful (525 Telfair Street, Augusta, GA, 722-8192) for their contribution of $300 per school for stream monitoring supplies.

Key Benefits

- Real world work
- Technology-rich
- Student and school collaboration

APPENDIX F
ENVIROSCAPE

EnviroScape® — Nonpoint Source Model

Enviroscape Nonpoint Source Patent Number 5,427,530

Explore Landscape Please be patient, this page contains a 40 kb image, but the tour is worth the brief wait!

Nonpoint Source is the first in the EnviroScape series -- also know as EnviroScape I and EnviroScape II.

Water pollution comes from many sources. Nonpoint sources contribute a great deal to the pollution in our water bodies. The combined affect of pollution from many small sources can have a real impact on the quality of our shared water resources.

EnviroScape Nonpoint Source tracks pollution from nonpoint sources, including residential areas, forestry, transportation, recreation, agriculture and construction, as well as from industry as a point source. Pollution and runoff are visually apparent when rain falling over the landscape top carries soil (cocoa), chemicals (colored drink mixes) and oil (cocoa and water mixture) through a watershed to a body of water.

Best management practices include felt buffer strips as vegetation, clay to create berms and other methods to show conservation and water pollution prevention measures at work. It discusses nonpoint source pollution and the steps everyone can take to help prevent environmental contamination. It is also good for discussion about overall watershed concepts.

Nonpoint Source teaches the watershed concept in addition to point and nonpoint source pollution. Two waterways flow into a larger water body, which is representative of a lake, river, bay, or ocean. The unit comes complete with a kit containing

everything you need to demonstrate the movement of water through a watershed and the pollution that runoff may cause.

What Users Say . . .

"Using the EnviroScape unit, people can learn how water can become polluted when it travels over land, streets, yards and through storm drains and how their personal actions can affect the health of waterways where they live. The statistics collected over the years show that students have a better understanding of the stormwater runoff problem through the use of this model. This helps the RCD show its funders that the program is educating the students."

★CYNTHIA MALLETT, Education Coordinator Resource Conservation District of Greater San Diego County

---

"It's a people thing. At Cargill, the employees are the volunteers who go into the communities. With EnviroScape, they can show why pollution prevention is important for everyone. It's our way of giving back and more."

★BILL PRESTON, Cargill, Saginaw Foods Division

"EnviroScape is the leading teaching tool that water educators have for portraying the complexity and importance of water quality practices. We have used EnviroScape at every one of our Children's Groundwater Festivals. And, the expansion of the program and supplemental teaching materials just keep getting better through time."

★SUSAN SEACREST, President, The Groundwater Foundation

The Nonpoint Source unit includes: Nonpoint source landscape top (topographical map), clear base, houses, barn, factory, drain pipe, treatment plant, trees, golf flags, cows, cars and best management practices such as buffer strips, clay berms, manure container, soil, oils and chemicals (cocoa, drink mixes and oil mix), bridges, watercatcher, rainmaker, water plug, and User's Guide.

ITEM#	EnviroScape Product	Price + shipping
71005C	Nonpoint Source Unit	$679 + $25

ORDER NOW

Groundwater	Hazardous Materials	Landfill
Nonpoint Source	Riparian Kit	Wetlands

Home | EnviroScape Program | EnviroScape Models
Quick Facts | News | Frequently Asked Questions
Our Users Say... | Regional Contacts
Request Information | Ordering
Our Favorite Links
Your Feedback
Support
E-Mail

EnviroScape
14524-F Lee Road
Chantilly, VA 20151

Voice: +1 703-631-8810
Fax: +1 703-631-6558
E-mail: info@enviroscapes.com

APPENDIX G
WATER ENVIRONMENT FEDERATION (WEF) PROGRAM

Water Environment Federation

WEF.ORG

SEARCH go!

WEF Site Internet

Advanced WEF Search?

Technical Discussion Groups
Operations Central

WEFTEC
Conferences & Workshops
Career Opportunities

Bookstore
Membership Benefits
Periodicals & Newsletters

Buyer's Guide
Government Affairs
Public Information

What is WEF?

WEF Leadership

News Room

Fact Sheets

Glossary
Water Infrastructure Network Report
Educational Products
Stockholm Junior Water Prize

WEF for Students
Member Associations

WEF Committees
Technical Activities

About/Contact

Site Outline

WERF

MyWEF

Personalize!

Already Personalized?

Log In Now!

Forgot your password?

Public Information

Founded in 1928, the Water Environment Federation (WEF) is a not-for-profit technical and educational organization with members from varied disciplines who work toward the WEF vision of preservation and enhancement of the global water environment. The WEF network includes more than 100,000 water quality professionals from 77 Member Associations in 31 countries.

The WEF Public Information staff includes:

Nancy Blatt, Director, Public Information
1-703-684-2456
nblatt@wef.org

Lorraine Loken, Senior Manager, Public Education
1-703-684-2487
lloken@wef.org

Barry Eisenberg, Manager, Public Information
1-703-684-2480
beisenberg@wef.org

Keicha Barnum, Special Projects Manager
1-703-684-2400 ext.7021
kbarnum@wef.org

Lori Burkhammer, Administrative Assistant
1-703-684-2400 ext. 7020
lburkhammer@wef.org

Technical Discussion Groups
Operations Central
WEFTEC Conferences & Workshops Career Opportunities
Bookstore Membership Benefits Periodicals & Newsletters
Buyer's Guide Government Affairs
Public Information
WEF for Students Member Associations Technical Activities
About/Contact
Site Outline
WERF

WEFTEC 2001

October 13-17, 2001

Atlanta, Georgia, U.S.A.

Description

74th Annual Conference & Exposition on Water Quality and Wastewater Treatment

Click here to view Annual Conference Workshops and Technical Sessions by track.

Workshops

Creating a Water Reuse Market [View]
Small and Natural Systems and Water Reuse
October 13 8:30AM-5:00PM

Implementing Instrumentation, Control, and Information Technology in Activated Sludge Systems [View]
Computer Applications
October 13 8:30AM-5:00PM

Monitoring to Support Watershed Assessments and Total Maximum Daily Load (TMDL) [View]
Surface Water Quality and Ecology
October 13 8:30AM-5:00PM

Odor and Corrosion Characterization, Measurement, and Control in Collection Systems [View]
Plant Operations II
October 13 8:30AM-5:00PM

The People Side of Change Management [View]
October 13 8:30AM-5:00PM

Inoculate Yourself Against Ignorance: Learn about the CDC and ATSDR [View]
Plant Operations II
October 13 8:30AM-5:00PM

Research and Applications in Wastewater Treatment [View]
Municipal Wastewater Treatment Process
October 13 8:30AM-5:00PM

WERF: The Cyanide Challenge: Lessons Learned from WERF's Three-Year Study [View]
Research
October 13 8:30AM-5:00PM

Joint WEF/WERF: Is Your Utility "Measuring Up?" [View]
Management
October 14 8:30AM-5:00PM

WERF: Public Perception and Participation: When Emotion Trumps Reason, How Not to Fold [View]
Residuals and Biosolids Management

October 14 8:30AM-5:00PM

WERF: State-of-the-Art WWTP Sensing and Control Systems [View]
Plant Operations I
October 14 8:30AM-5:00PM

WERF: Technology and Watershed Assessment: Application to Reasonable Assurance Determinations in Columbus, Georgia [View]
Surface Water Quality and Ecology
October 14 8:30AM-5:00PM

Analytical Data QA/QC, Validation and Management [View]
Surface Water Quality and Ecology
October 14 8:30AM-5:00PM

Decentralized Wastewater Management - Best Practices 2001 [View]
Small and Natural Systems and Water Reuse
October 14 8:30AM-5:00PM

Market Opportunities in Asia and Resources to Help U.S. Companies Succeed [View]
Local, International, and Public Education
October 14 12:00PM-5:00PM

Operation of Industrial Wastewater Treatment Plants [View]
Industrial Issues and Treatment Technology
October 14 8:30AM-5:00PM

Selection and Application of Residual Transport Systems: Rheology and Mythology [View]
Residuals and Biosolids Management
October 14 8:30AM-5:00PM

The Benefits to Performing an EPA cMOM Audit [View]
Collection Systems
October 14 8:30AM-5:00PM

Traits of a Successful LIMS Implementation: Approaches to Selecting and Implementing a LIMS in Your Lab [View]
Plant Operations II
October 14 8:30AM-5:00PM

Operation and Maintenance of Pumps [View]
Plant Operations I
October 13 8:30AM-5:00PM

The Habitat Assessment Process: An Introduction to Ecological Assessment Using U.S. EPA's Bioassessment Procedures [View]
Surface Water Quality and Ecology
October 13 8:30AM-5:00PM

Wastewater Microbiology [View]
Plant Operations I
October 13 8:30AM-5:00PM

Wastewater Microbiology [View]
Plant Operations I
October 14 8:30AM-5:00PM

Technical Programs

Biological Nutrient Removal with AEESP Lecture [View]
Research
October 15 1:30PM-5:00PM

Watershed Management for Lakes [View]
Surface Water Quality and Ecology
October 15 1:30PM-5:00PM

Watershed Assessment Modeling [View]
Surface Water Quality and Ecology

October 15 1:30PM-5:00PM

Privatization—Two Panel Presentations [View]
Management
October 15 1:30PM-5:00PM

Water Reclamation and Reuse I [View]
Small and Natural Systems and Water Reuse
October 15 1:30PM-5:00PM

Instrumentation, Control and Automation [View]
Computer Applications
October 15 1:30PM-5:00PM

Plant Operations and Maintenance: Clarification and Plant [View]
Models
Plant Operations I
October 15 1:30PM-5:00PM

Management of Odors and VOCs I [View]
Plant Operations I
October 15 1:30PM-5:00PM

Plant Operations and Maintenance [View]
Plant Operations II
October 15 1:30PM-5:00PM

Local Issues–Planning for Growth [View]
Local, International, and Public Education
October 15 1:30PM-5:00PM

Regulatory Update 2001 and A Focus on TMDLs [View]
Local, International, and Public Education
October 15 1:30PM-5:00PM

Pretreatment of Industrial Wastes [View]
Industrial Issues and Treatment Technology
October 15 1:30PM-5:00PM

Molecular Techniques [View]
Research
October 16 8:30AM-12:00PM

Physical-Chemical Processes [View]
Research
October 16 8:30AM-12:00PM

Pharmaceutical and Chemical Industries [View]
Industrial Issues and Treatment Technology
October 16 8:30AM-12:00PM

Biological Nutrient Control [View]
Municipal Wastewater Treatment Process
October 16 8:30AM-12:00PM

Anaerobic Digestion [View]
Residuals and Biosolids Management
October 16 8:30AM-12:00PM

In Situ Remedial Technologies [View]
Remediation of Soils and Groundwater
October 16 8:30AM-12:00PM

Wet Weather Issues II [View]
Collection Systems
October 16 8:30AM-12:00PM

CSO and Urban Stormwater Issues [View]
Surface Water Quality and Ecology
October 16 8:30AM-12:00PM

Watershed Plan Implementation [View]

Surface Water Quality and Ecology
October 16 8:30AM-12:00PM

Watersheds--Assessment, Source Water and Non-point BMPs [View]
Surface Water Quality and Ecology
October 16 8:30AM-12:00PM

Membrane Bioreactor and Membrane Systems [View]
Municipal Wastewater Treatment Process
October 15 1:30PM-5:00PM

Total Quality Case Studies [View]
Management
October 16 8:30AM-12:00PM

Water Reclamation and Reuse II [View]
Small and Natural Systems and Water Reuse
October 16 8:30AM-12:00PM

AWWA/WEF Joint Session [View]
Computer Applications
October 16 8:30AM-12:00PM

Plant Operations & Maintenance—Energy Management and Plant Optimization [View]
Plant Operations I
October 16 8:30AM-12:00PM

Management of Odors and VOCs II [View]
Plant Operations I
October 16 8:30AM-12:00PM

UV Disinfection [View]
Plant Operations II
October 16 8:30AM-12:00PM

International Issues [View]
Local, International, and Public Education
October 16 8:30AM-12:00PM

Building Trust and Stewardship Through Education and Outreach [View]
Local, International, and Public Education
October 16 8:30AM-12:00PM

Activated Sludge [View]
Research
October 16 1:30PM-5:00PM

Biodegradation [View]
Research
October 16 1:30PM-5:00PM

Attached Growth and Hybrid Treatment Systems [View]
Municipal Wastewater Treatment Process
October 15 1:30PM-5:00PM

Pulp and Paper Wastewater [View]
Industrial Issues and Treatment Technology
October 16 1:30PM-5:00PM

Egg and Poultry Wastewater Treatment Issues [View]
Industrial Issues and Treatment Technology
October 16 1:30PM-5:00PM

Treatment Process Modeling [View]
Municipal Wastewater Treatment Process
October 16 1:30PM-5:00PM

Physical-Chemical Treatment Processes [View]
Municipal Wastewater Treatment Process
October 16 1:30PM-5:00PM

Innovative Technology Forum
Municipal Wastewater Treatment Process [View]
October 16 1:30PM-5:00PM

Class A. Beneficial Reuse
Residuals and Biosolids Management [View]
October 16 1:30PM-5:00PM

Phased Digestion
Residuals and Biosolids Management [View]
October 16 1:30PM-5:00PM

Remediation Technologies – Development and Application
Remediation of Soils and Groundwater [View]
October 16 1:30PM-5:00PM

Trenchless Technology
Collection Systems [View]
October 16 1:30PM-5:00PM

TMDL I—Regulation and Technical Issues
Surface Water Quality and Ecology [View]
October 16 1:30PM-5:00PM

Thickening and Dewatering
Residuals and Biosolids Management [View]
October 15 1:30PM-5:00PM

Water Quality Criteria–Toxicity Issues
Surface Water Quality and Ecology [View]
October 16 1:30PM-5:00PM

Asset Management
Management [View]
October 16 1:30PM-5:00PM

Small Communities
Small and Natural Systems and Water Reuse [View]
October 16 1:30PM-5:00PM

Integration of Information Technologies
Computer Applications [View]
October 16 1:30PM-5:00PM

Plant Operations and Maintenance—Biological Nutrient Removal Systems [View]
Plant Operations I
October 16 1:30PM-5:00PM

Hot Topics in Disinfection
Plant Operations II [View]
October 16 1:30PM-5:00PM

Latin America
Local, International, and Public Education [View]
October 16 1:30PM-5:00PM

Nitrification
Research [View]
October 17 8:30AM-12:00PM

Health Related Topics
Research [View]
October 17 8:30AM-12:00PM

Membrane Processes
Research [View]
October 17 8:30AM-12:00PM

Heat Drying and Incineration
Residuals and Biosolids Management [View]
October 15 1:30PM-5:00PM

October 15 1:30PM-5:00PM

Biological Treatment in the Food Processing Industry [View]
Industrial Issues and Treatment Technology
October 17 8:30AM-12:00PM

Biological Treatment [View]
Industrial Issues and Treatment Technology
October 17 8:30AM-12:00PM

Wet Weather Treatment Systems [View]
Municipal Wastewater Treatment Process
October 17 8:30AM-12:00PM

Selected Topics [View]
Municipal Wastewater Treatment Process
October 17 8:30AM-12:00PM

Biosolids Management [View]
Residuals and Biosolids Management
October 17 8:30AM-12:00PM

Risk Management—Modeling-The Crystal Ball of the 21st Century [View]
Collection Systems
October 17 8:30AM-12:00PM

Regulations—What's in Store, cMOM/GASB/SSO/CSO [View]
Collection Systems
October 17 8:30AM-12:00PM

TMDL II—Implementation, Design and Case Studies [View]
Surface Water Quality and Ecology
October 17 8:30AM-12:00PM

Western Streams [View]
Surface Water Quality and Ecology
October 17 8:30AM-12:00PM

Environmental Monitoring [View]
Surface Water Quality and Ecology
October 17 8:30AM-12:00PM

Wet Weather Issues I [View]
Collection Systems
October 15 1:30PM-5:00PM

Total Quality Tool Kit [View]
Management
October 17 8:30AM-12:00PM

Natural Soil Based Systems [View]
Small and Natural Systems and Water Reuse
October 17 8:30AM-12:00PM

Information Technologies for Planning, Modeling, and Design [View]
Computer Applications
October 17 8:30AM-12:00PM

Plant Operations and Maintenance—Biological Systems [View]
Plant Operations I
October 17 8:30AM-12:00PM

Implementing a Wastewater Laboratory Analyst Certification Program [View]
Plant Operations II
October 17 8:30AM-12:00PM

Local Issues—Watersheds and Water Quality in Georgia [View]
Local, International, and Public Education
October 17 8:30AM-12:00PM

Privatization, Public/Private Partnerships, Creative Financing [View]

Local, International, and Public Education
October 17 8:30AM-12:00PM

Clarifier-Thickener Processes
Research [View]
October 17 1:30PM-5:00PM

Automotive and Metals Wastewater
Industrial Issues and Treatment Technology [View]
October 17 1:30PM-5:00PM

Biological Nutrient Removal
Municipal Wastewater Treatment Process [View]
October 17 1:30PM-5:00PM

Operation and Maintenance–May the Flow Be with You
Collection Systems [View]
October 15 1:30PM-5:00PM

Chlorine Safety in the Wastewater Industry
Municipal Wastewater Treatment Process [View]
October 17 1:30PM-5:00PM

Operations and Maintenance
Residuals and Biosolids Management [View]
October 17 1:30PM-5:00PM

Incorporating Chemical Exposure Frequency, Magnitude, and
Duration Into Water Quality Criteria and NPDES Permit Limits [View]
Remediation of Soils and Groundwater
October 17 1:30PM-5:00PM

The Real Time Experience
Collection Systems [View]
October 17 1:30PM-5:00PM

Ecological Issues
Surface Water Quality and Ecology [View]
October 17 1:30PM-5:00PM

Strategic Planning
Management [View]
October 17 1:30PM-5:00PM

Natural Systems in Small Communities
Small and Natural Systems and Water Reuse [View]
October 17 1:30PM-5:00PM

Access to Information and Records Management
Computer Applications [View]
October 17 1:30PM-5:00PM

Wastewater Laboratory Analytical Issues
Plant Operations II [View]
October 17 1:30PM-5:00PM

Plant Operations and Maintenance—Solids Digestion
Plant Operations I [View]
October 17 1:30PM-5:00PM

Stormwater Treatment
Surface Water Quality and Ecology [View]
October 15 1:30PM-5:00PM

Facility Tours

Cobb County Chattahoochee Tunnel
October 14 1:00PM-5:00PM [View]

City of Atlanta Utoy Creek Water Reclamation Center
October 17 8:00AM-12:00PM [View]

Lockheed Martin Aeronautics Company [View]
October 17 8:00AM-12:00PM

Clayton County Water Authority E.L. Huie Water Reclamation Facility [View]
October 15 1:00PM-5:00PM

Douglasville-Douglas County Water And Sewer Authority South Central Urban W [View]
October 15 1:00PM-5:00PM

Gwinnett County SCADA-Based Flow Management System And Suwanee Creek Pumpin [View]
October 15 1:00PM-5:00PM

DeKalb County Biosolids Land Application Facility [View]
October 16 8:00AM-12:00PM

City Of Atlanta R.M. Clayton Water Reclamation Center [View]
October 16 8:00AM-12:00PM

Cobb County Water System Operations Facility [View]
October 16 8:00AM-12:00PM

Columbus Water Works Combined Sewer Overflow Advanced Demonstration Facilit [View]
October 16 9:00AM-4:00PM

Gwinnett County F. Wayne Hill Water Resources Center [View]
October 16 1:00PM-5:00PM

Water Environment Federation
601 Wythe Street
Alexandria, VA 22314-1994 USA
Tel 1-800-666-0206 (U.S. and Canada)
Tel 1-703-684-2452 (Outside the U.S. and Canada)
Fax: 1-703-684-2492
www.wef.org

The Water Environment Federation, The Water Environment Federation, The Water Environment Federation, The Water Environment Federation, The Water Environment Federation

Technical Discussion Groups
Operations Central
WEFTEC Conferences & Workshops
Career Opportunities
Bookstore
Membership Benefits
Periodicals & Newsletters
Buyer's Guide
Government Affairs
Public Information
WEF for Students
Member Associations
Technical Activities
About/Contact
Site Outline
WERF

Back

Monitoring to Support Watershed Assessments and Total Maximum Daily Load (TMDL)

Saturday, October 13, 2001
08:30 AM- 05:00 PM

Sponsor: WEF Nonpoint Source Committee and the WEF Watershed Management Committee

Number: S106

Track Name: Surface Water Quality and Ecology

Description:
Watershed monitoring is a crucial step to assessing the health of watersheds and determining the status of stream designated uses. Due to widespread litigation, the recent new emphasis on the development of Total Maximum Daily Loads (TMDLs) and the promulgation of new TMDL regulations has initiated a burst of TMDL development and implementation activity throughout the country. As the TMDLs are developed and implemented, monitoring will play a pivotal role in determining if TMDLs are being met, and in developing pollutant trading programs to help meet regulatory requirements. This workshop is intended to provide all stakeholders with the latest information regarding:

· Important considerations for designing a monitoring program;
· Basic components of water quality and biological monitoring, including choosing representative study and reference stations, developing appropriate metrics, and interpreting and presenting results;
· Examples of monitoring programs and lessons learned from several case studies;
· Creative and innovative technologies for collecting and managing monitoring data.

Speakers
Avinash Patwardhan, CH2M HILL, Inc., Workshop Chair
Trent Stober, Midwest Environmental Consultants, Workshop Vice Chair
James Karr, University of Washington
Tony Roux, Mecklenburg County Environmental
Larry Ausley, NC DWQ-Environmental Sciences Branch
Margaret Heber, U.S. EPA
Chris Yoder, Ohio EPA
Susan Gilbertson, U.S. EPA
Tyler Richards, City of Atlanta
Charles Hagedorn III, Virginia Technology Institute and State University
Carol Crouch, U.S. Geological Survey
Bill Kreutzberger, CH2M HILL, Inc.
Douglas Baughman, CH2M HILL, Inc.
Bill Showers, North Carolina State University
Ned Pennock, CH2M HILL, Inc.

APPENDIX H
TELTRAIN

NSC Educational Programs

TELTRAIN

At various intervals during the year, the National Science Center broadcasts satellite programs called TELTRAIN, producing 21 programs to date. The programs focus on science, math, or technology subjects and are usually geared to middle school teachers and students; however, anyone with the capability to receive C band signal is able to participate. Some broadcasts are live, interactive videoteleconferences (one-way video, two-way audio), but most are pre-recorded. The footprint of the satellite used to broadcast is nationwide. Announcements about upcoming programs are mailed out to a database of other satellite consortiums, school districts, public broadcast television stations, and individual teachers. Announcements also are published in SATLINK, a videoteleconference programming guide.

APPENDIX I
POTENTIAL FUNDING SOURCES

Potential Funding Sources:

Capitalization Grants for Clean Water State Revolving Funds
Contact:
US Environmental Protection Agency
Office of Wastewater Management
SRF Branch, Municipal Support
Division (4204)
Ariel Rois Building
1200 Pennsylvania Avenue, NW
Washington DC 20460
(202) 260-7360

Nonpoint Source Implementation Grants
Contact:
US Environmental Protection Agency
Office of Wetlands, Oceans and Watersheds
Nonpoint Source Control Branch (4503F)
Ariel Rois Building
1200 Pennsylvania Avenue, NW
Washington DC 20460
(202) 260-7100

Watershed Assistance Grants
Contact:
US Environmental Protection Agency
Office of Wetlands, Oceans and Watersheds
Nonpoint Source Control Branch (4501F)
Ariel Rois Building
1200 Pennsylvania Avenue, NW
Washington DC 20460
(202) 260-4538

Funding Information

New Catalog of Federal Funding Sources for Watershed Protection (Second Edition) available

This new Catalog provides a guide for watershed practitioners on the federal monies that might be available to fund a variety of watershed protection projects. This version of the Catalog updates EPA's Catalog of Federal Funding Sources for Watershed Protection published in 1997 (EPA 841-B-97-008). This new funding Catalog presents information on 69 federal funding sources (grants and loans) that may be used to fund watershed projects. The Catalog includes key words which may be used to search for funding programs for particular subject areas. Copies of the Catalog are available from NSCEP at 800-490-9198 (include document number in requests: EPA 841-B-99-003)

- **Section 319 Nonpoint Source Program**
- **Community Based Environmental Protection (CBEP) Financial and Technical Resources**
- **Section 314 Clean Lakes Program**
- **Questions and Answers on the Relationship Between Sec. 319 Nonpoint Source and Sec. 314 Clean Lakes Program**
- **Clean Water Act State Revolving Fund**
- **Drinking Water State Revolving Fund**
- **Environmental Finance Centers**
- **Transportation Equity Act for the 21st Century**

Watershed Assistance Grants EXIT EPA

The Environmental Finance Center
--The University System of Maryland EXIT EPA

Office of Wetlands, Oceans & Watersheds Home | Watershed Protection Home

EPA Home | Office of Water | Search | Comments

http://www.epa.gov/owow/watershed/funding.html
Revised August 25, 1999

United States
Environmental Protection Agency

Office of Water
(4503F)

EPA 841-B-99-003
December 1999

Catalog of Federal Funding Sources for Watershed Protection Second Edition

Table of Contents

Foreword

Preface

Introduction

Private, Nonprofit Sources
Federal Sources

Funding Sources (organized according to topic)

Index by Department/Agency

Index by Keyword

Index by Statute

Index by Title

Appendix A. Federal Agnecy Regional and State Offices (HTML or PDF, 42K)

Appendix B. EMPACT Metropolitan Areas (HTML or PDF, 43K)

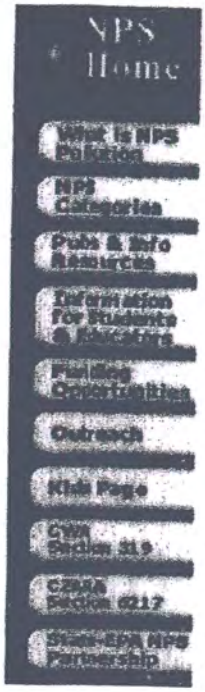
Appendix C. User Feedback (HTML or PDF, 14K)

Download Entire Catalog (WordPerfect, 2MG, Doesn't include the appendixes.)
Download Entire Catalog (PDF, 427K, Doesn't include the appendixes.)

Adobe Acrobat Reader is required to view PDF documents. The most recent version of the Adobe Acrobat Reader is available as a free download. An Adobe Acrobat plug-in for assisted technologies is also available.

This page was updated 05/18/2001 11:15:18
http://www.epa.gov/OWOW/watershed/wacademy/fund.html

EPA Server Information



Clean Waters Act Section 319

Congress amended the Clean Water Act (CWA) in 1987 to establish the section 319 Nonpoint Source Management Program because it recognized the need for greater federal leadership to help focus State and local nonpoint source efforts. Under section 319, State, Territories, and Indian Tribes receive grant money which support a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the success of specific nonpoint source implementation projects.

- Section 319 of the Clean Water Act
Text of section 319 from the CWA.

- Process for Applying for 319(h) Funds

- Section 319 Final Project Reports (PDF, 3.3MB)
This document describes the purpose of section 319 final reports, the information that should be included in the report, examples of especially effective elements from 319 reports, and ways to expand the final report to be used for outreach and education, building partnerships, and many other uses.

- Tribal Information

- Section 319 National Monitoring Program EXIT EPA
The Section 319 National Monitoring Program projects comprise a small subset of NPS pollution control projects funded under Section 319 of the Clean Water Act as amended in 1987. The goal of the program is to support 20 to 30 watershed projects nationwide that meet a minimum set of project planning, implementation, monitoring, and evaluation requirements designed to lead to successful documentation of project effectiveness with respect to water quality protection or improvement.

- Section 319 Nonpoint Source National Monitoring Program Successes and Recommendations (November 2000 -- pre-print) EXIT EPA
The Section 319 National Monitoring Program projects have quantified water quality improvements from nonpoint source controls and strengthened strategies for effective future watershed programs. Highlights are given from each of the 23 Section 319 National Monitoring Program projects.

- Section 319 Nonpoint Source Success Stories

This document demonstrates the successful implementation of the section 319 Clean Water Act Nonpoint Source program. The report provides examples of successful solutions to a variety of water quality problems caused by nonpoint source pollution.

- Section 319 Success Stories: Volume II

This document is the second volume of *Section 319 Success Stories.* The document gives examples of success stories that have come with the maturation of state nonpoint source programs.

EPA Guidance

- Supplemental Guidelines for the Award of Section 319 Nonpoint Source Grants in FY 2001

EPA has developed guidelines for the award of Clean Water Act Section 319 nonpoint source grants in FY 2001. The guidelines are intended to assist States, Territories, and Tribes in identifying the process and criteria to be used in distributing FY 2001 319 grants. The process and criteria are generally the same as were used in FY 2000, which are provided in four documents: *Nonpoint Source Program and Grants Guidance for Fiscal Years 1997 and Future Years* (May 1996); *Process and Criteria for Funding State and Territorial Nonpoint Source Management Programs in FY 1999* (August 18, 1998); *Funding the Development and Implementation of Watershed Restoration Action Strategies under Section 319 of the Clean Water Act* (December 4, 1998); and *Supplemental Guidance for the Award of Section 319 Nonpoint Source Grants in FY 2000* (December 21, 1999). The guidance provided by each of these four documents remains fully in effect except to the extent that they are specifically modified in these guidelines.

- Supplemental Guidance for the Award of Section 319 Nonpoint Source Grants in FY 2000

- Guidance on Awarding Section 319 Grants to Indian Tribes in FY 2000

- Nonpoint Source Program and Grants Guidance for Fiscal Year 1997 and Future Years

This guidance promotes a new generation of strong partnerships between the U.S. Environmental Protection Agency (EPA) and State lead nonpoint source agencies.

- Process and Criteria for Funding State and Territorial Nonpoint Source Management Programs in FY 1999

This guidance provides updated information to the Nonpoint Source Program Grants Guidance (link immediately above). The previous guidance remains in effect except for the modifications listed within this link.

- Funding the Development and Implementation of Watershed Restoration Action Strategies under Section 319 of the Clean Water Act

Congress has appropriated an extra $100 million for the development and implementation of Watershed Restoration Action Strategies under Section 319 of the Clean Water Act for fiscal year 1999. This document provides guidance for the

allocation and use of those funds.

- Process for Approval of Upgraded State and Territorial Nonpoint Source Management Programs and Formal Recognition of Enhanced Benefit Status
This memorandum reviews the specific process that EPA is using to approve upgraded State and Territorial Nonpoint Source Management Programs and to formally recognize Enhanced Benefits Status, as described in the Nonpoint Source Program and Grants Guidance for Fiscal Years 1997 and Future Years (May 1996--link above).

- Section 319 Federal Consistency Guidance

- The Draft Proposed Strategy for Strengthening Nonpoint Source Management
The Draft Proposed Strategy for Strengthening Nonpoint Source Management was presented by EPA, at the Wye River Conference Center, to stakeholders in the National Nonpoint Source Program on October 14, 1997

- Guidance on the Use of Clean Water Act and Safe Drinking Water Authorities to Address Management Needs for Lakes and Reserviors
This guidance, issued on July 9, 1998, provides information on the eligibility of lake and reservoir restoration and protection activities under section 319 of the CWA. It also encourages the use of other CWA and SDWA authorities for restoring and protec ting lakes and reservoirs.

- Questions and Answers on the Relationship Between the Sec. 319 Nonpoint Source Program and the Sec. 314 Clean Lakes Program
This guidance clarifies the relationship between the Clean Water Act section 319 Nonpoint Source Program and the section 314 Clean Lakes Program.

Adobe Acrobat Reader is required to view PDF documents. The most recent version of the Adobe Acrobat Reader is available as a free download. An Adobe Acrobat plug-in for assisted technologies is also available.

Office of Wetlands, Oceans & Watersheds Home | Watershed Protection Home

EPA Home | Office of Water | Search | Comments | Contacts

Revised: 07/25/2001 16:01:42
http://www.epa.gov/owow/nps/cwact.html

Process for Applying for 319(h) Funds

Clean Water Act Section 319(h) funds are provided only to designated state and tribal agencies to implement their approved nonpoint source management programs. State and tribal nonpoint source programs include a variety of components, including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and regulatory programs. Each year, EPA awards Section 319(h) funds to states in accordance with a state-by-state allocation formula that EPA has developed in consultation with the states.

In accordance with guidance issued by EPA under Section 319 of the Clean Water Act, Section 319(h) funding decisions are made by the states. States submit their proposed funding plans to EPA. If a state's funding plan is consistent with grant eligibility requirements and procedures, EPA then awards the funds to the state.

For state-specific application information, please contact your state NPS coordinator.

Download WordPerfect list of state NPS coordinators

Office of Wetlands, Oceans & Watersheds Home | Watershed Protection Home

EPA Home | Office of Water | Search | Comments | Contacts

Revised: 04/10/2001 10:07:58
http://www.epa.gov/owow/nps/319hfunds.html

EPA United States Environmental Protection Agency

Environmental Finance Program

State Revolving Fund Events and Announcements

State Revolving Fund - Events and Announcements

- **EPA Proposes Future Funding for Water State Revolving Fund,** Announcement: June 17, 1997

The U.S. Environmental Protection Agency (EPA) has issued a proposal to provide future funding for two key environmental infrastructure programs, the Clean Water and Drinking Water State Revolving Funds (SRFs).

Working in cooperation with the Office of Management and Budget (OMB), EPA's Office of Water has developed a plan to capitalize the Clean Water and Drinking Water SRFs so that, on a national basis, they will generate average annual assistance (that is, revolve) at a level of about $2 billion and $500 million, respectively. The Agency's proposed capitalization schedule, which extends through fiscal year 2003 for each program, represents efforts to fund the Clean Water and Drinking Water SRFs so that they will provide a perpetual source of financial assistance for eligible high-priority water quality and public health projects. The plan is consistent with the deficit-reduction initiative currently under discussion by the Administration and the Congress.

For more information about this capitalization proposal, or for more information about the SRFs, please contact Kevin Rosseel at 202 260-3715 or via Internet at rosseel.kevin@epamail.epa.gov

---

- **Final Guidelines for the New Hardship Grants Program for Rural Communities**

The U.S. Environmental Protection Agency published a Federal Register Notice of Availability of Final Guidelines for the new Hardship Grants Program for Rural Communities, as well as a state-by-state funding allotment.

The final guidelines implement a $50 million grant program authorized by the Congressional Appropriations Act of 1996. EPA will make grants to States, which in turn can provide assistance to improve wastewater treatment services in poor, rural communities with populations of 3,000 or fewer where such services are currently inadequate.

Many small, rural communities have outdated or failing on-site wastewater treatment systems, but often lack the resources to improve service. Such communities can qualify for assistance if: they lack access to centralized wastewater treatment or collection systems, or need improvements to on-site treatment systems; per capita income is less than 80 percent of the national average; the

unemployment rate exceeds the national average by one percentage point or more; and the proposed project will improve public health or reduce environmental risk.

The Hardship Grants Program will be implemented in conjunction with the Clean Water State Revolving Fund loan program, which offers low-interest loans for wastewater treatment and other water-quality projects.

For a copy of the Federal Register Notice, please visit this Internet site (copy and paste URL from this message and insert into your Internet locator): http://www.epa.gov/docs/fedrgstr/EPA-WATER/1997/March/Day-20/w7070.htm

For a copy of the guidelines, you may also contact: Stephanie vonFeck (4204), Environmental Protection Agency, 401 M Street SW, Washington, DC 20460; via Internet at vonfeck.stephanie@epamail.epa.gov; or at (202)260-2268.

- Hardship Grants Program for Rural Communities Fact Sheet and Guidelines Note: the Guidelines are in the PDF Format.

- **EPA Press Release, March 7, 1997:**

EPA Issues Final Guidelines For Drinking Water State Revolving Fund

EPA has released to states its final guidelines for implementing the nation's first Drinking Water State Revolving Fund dedicated to protecting public health and compliance with the 1996 Safe Drinking Water Act. Congress has authorized $9.6 billion for the revolving loan fund through the year 2003. EPA soon will begin awarding the first round of federal capitalization grants to states totaling $1.275 billion nationally.

Under the revolving loan fund program, EPA awards grants to states which, in turn, provide loans and other assistance to qualifying communities.The fund will help ensure that the nation's drinking water supplies remain safe and affordable, allowing each state to provide financial support for drinking water needs for years to come.

A particular emphasis has been placed on assisting smaller drinking water systems to ensure that such systems have adequate technical, managerial and financial resources to maintain compliance and provide safe water. The new program also establishes a strong new emphasis on preventing contamination problems through source water protection and enhanced system management. Each state will be allowed considerable flexibility in determining the design of its program and to direct funding towards its most pressing compliance and public health protection needs.

For additional information or copies of the guidelines, the general public can call EPA's Safe Drinking Water Hotline at 1-800-426-4791.The guidelines are also available through the internet: Drinking Water State Revolving Fund Guidelines.

- **State Revolving Fund Workshops**

These workshops, conducted with the Region 3 Environmental Finance Center have been postponed. For further information call 301-405-6384 (the Environmental Finance Center).

- State Revolving Fund State Contacts

[EPA Home Page | Comments | Browse | Index | EFP Home Page]

Send comments, questions or suggestions to: efin@epamail.epa.gov

Modified 6/17/97
URL: http://www.epa.gov/efinpage/srfann

River Network Offers

Two Grants Programs:

Grant	Who's Eligible	Type of Funding
Partner Grants	River Network Partners	to support member and volunteer development activities
Watershed Assistance Grants(funds provided by EPA)	Local Watershed Partnerships	to support organizational development and long-term effectiveness

Watershed Assistance Grants 2001

WAG
WATERSHED ASSISTANCE GRANTS

River Network makes grants available to local watershed partnerships to support their organizational development and long-term effectiveness.

Criteria and Application | Background Information | 2000 Awardees
1999 WAG Evaluation (Adobe Acrobat File)

2001 UPDATE

(updated August 10, 2001)

EPA awarded River Network $200,000 to distribute to watershed partnerships via the WAG program.

Criteria and application information are now available

Proposals were due (postmarked by) **JULY 20, 2001**.
184 proposals were submitted requesting over $3.7 million.

Awards will be announced by **NOVEMBER 30, 2001**.

Not sure if WAG is for you? Take a quick **Self Pre-test** and find out!

2000 WAG Awardees

In 2000, River Network received $363,000 from EPA to distribute to watershed partnerships through the **Watershed Assistance Grant** (WAG) program. River Network staff and the WAG Advisory Committee reviewed 400 proposals representing 46 states and requesting over $8,928,396.

The following organizations' projects were approved for funding in 2000.

- **Pilot Point Traditional Council, AK**: "Ugashik Watershed Coalition"
- **Yukon River Inter-Tribal Watershed Council, AK**: Yukon River River-Wide Assessment Project
- **Upper Eel Watershed Forum, CA**: "The Upper Eel Watershed Forum Assistance Project"
- **Pomperaug River Watershed Coalition, CT**: "An Outreach Program for the Pomperaug Watershed-Building & Sustaining Community Support for a Coalition
- **University of Hawaii - Hawaii Stream Research Center, HI**: "Laupahoehoe Nui Ahupua'a Management Project"
- **Bonner Soil & Water Conservation District, ID**: "Pack River Watershed Group"
- **Bull Creek Stakeholders Association, IL**: "Bull Creek Stakeholders Association: Growing the Watershed Partnership"
- **Little Tchefuncte River Association, LA**: "Building Partnerships on the Little Tchefuncte and Tributaries"
- **Jones Falls Watershed Association, MD**: "Outreach and Membership Development"
- **Union River Watershed Coalition, ME**: "Union River Watershed Coalition: The Next Stop"
- **Blackfoot Challenge, MT**: "Blackfoot Drought Response Plan to Protect Native Fisheries Resources"
- **Watershed Association of the Tuskasegee River, NC**: "WATR 2001 Expansion Project"
- **Eastern Band of Cherokee Indians, NC**: "Lower Little Tennessee Watershed Project 2001"
- **Picuris Pueblo, NM**: "Picuris Pueblo Water Quality Monitoring Program"
- **Woonasquatucket River Watershed Council, RI**: "Woonasquatucket River Watershed Project Coordinator"
- **Friends of the Edisto, SC**: "Edisto River Basin Community Outreach for Partnerships in Watershed Protection"
- **Clean Water Fund of Texas, TX**: "Upper Trinity Watershed Partnership Project"
- **Browns River Watershed Council, VT**: "Crafting a vision for the Browns River Watershed through public forums."
- **Thornton Creek Alliance, WA**: "Thornton Creek Watershed Oversight Council"
- **Friends of Lake Wingra, WI**: "The Lake Wingra Watershed: Building a Sustainable Community"

If you have further questions, please email them to wag@rivernetwork.org.

Background Information

In February 1998, the U.S. Environmental Protection Agency, the Departments of Agriculture, Commerce, Defense, Energy, Interior, Justice and Transportation and the Tennessee Valley Authority joined forces in issuing the Clean Water Action Plan.

The Clean Water Action Plan calls for the creation of a dedicated source of funding to build the capacity of existing or new watershed partnerships to protect and restore their watershed. These partnerships would serve as national demonstrations or models of how to bring together diverse interests to achieve watershed protection and restoration and of how to ensure diversity in watershed partnerships.

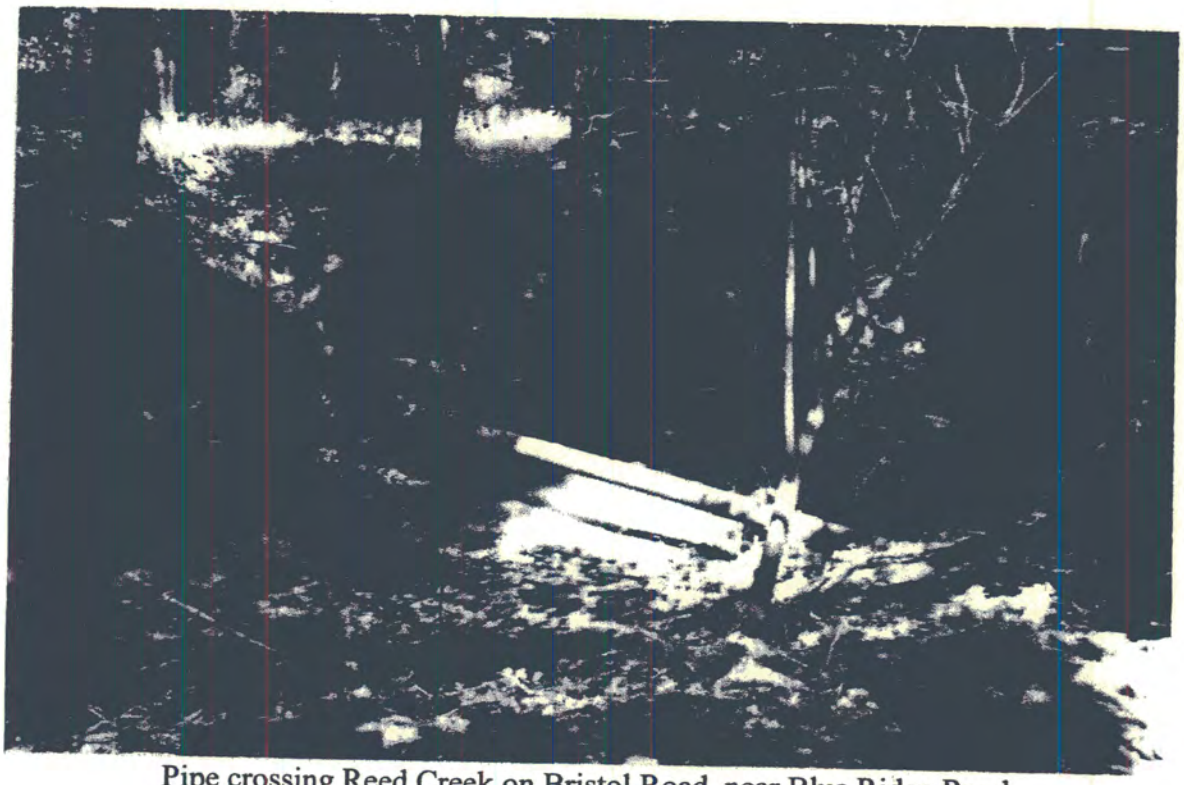
In September 1998, the Environmental Protection Agency's Office of Wetlands, Oceans, & Watersheds selected River Network to coordinate and administer the Watershed Assistance Grants Program (WAG). The WAG program will make grants to local watershed partnerships to support their organizational development and long-term effectiveness.

Grants will be distributed to a pool of applicants, which are diverse in terms of geography, watershed issues, the type of partnership, and approaches.

(Call 1-800-490-9198 to order a copy of the Clean Water Action Plan, or go to: www.cleanwater.gov)

River Network, 520 SW 6th Ave., Portland, OR 97204 * 503/241-3506

APPENDIX J
PHOTO



Pipe crossing Reed Creek on Bristol Road, near Blue Ridge Road