

## CHAPTER 5

# WATER QUALITY PROGRAMS AND PROGRAM INITIATIVES IN THE BASIN

### 5.1 INTRODUCTION

This chapter summarizes the programs available for protecting water quality and addressing water quality problems in the Hiwassee River Basin. It also includes a number of important initiatives being implemented by federal, state, local and private interests. Section 5.2 summarizes the state and federal legislative authorities developed to protect water quality. Section 5.3 presents the water quality standards and classifications program. Sections 5.4 and 5.5, respectively, present existing point and nonpoint source pollution control programs. A more complete description of these programs can be found in Appendix VI. Section 5.6 presents water quality program initiatives that have been implemented within the basin. Section 5.7 discusses integration of point and nonpoint source control management strategies and introduces the concept of *total maximum daily loads* (TMDLs). Section 5.8 presents potential sources of funding for water quality projects.

### 5.2 STATE AND FEDERAL LEGISLATIVE AUTHORITIES FOR NORTH CAROLINA'S WATER QUALITY PROGRAM

Authorities for some of the programs and responsibilities carried out by the Water Quality Section are derived from a number of federal and state legislative mandates outlined below. The major federal authorities (Section 5.2.1) for the state's water quality program are found in sections of the Clean Water Act (CWA). State authorities listed in Section 5.2.2 are from state statutes.

#### 5.2.1 Federal Authorities for NC's Water Quality Program

- **Section 301** - Prohibits the discharge of pollutants into surface waters unless permitted by EPA.
- **Section 303(c)** - States are responsible for reviewing, establishing and revising water quality standards for all surface waters.
- **Section 303(d)** - Each state shall identify those waters within its boundaries for which the effluent limits required by section 301(b)(1) A and B are not stringent enough to protect any water quality standards applicable to such waters.
- **Section 305(b)** - Each state is required to submit a biennial report to the EPA describing the status of surface waters in that state.
- **Section 319** - Each state is required to develop and implement a nonpoint source pollution management program.
- **Section 402** - Establishes the National Pollutant Discharge Elimination System (NPDES) permitting program. Allows for delegation of permitting authority to qualifying states (includes North Carolina).
- **Section 404/401** - Section 404 regulates the discharge of fill materials into navigable waters and adjoining wetlands unless permitted by the US Army Corps of Engineers. Section 401 requires the Corps to receive a state Water Quality Certification prior to issuance of a 404 permit.

## 5.2.2 State Authorities for NC's Water Quality Program

- **G.S. 143-214.1** - Directs and empowers the NC Environmental Management Commission (EMC) to develop a water quality standards and classifications program.
- **G.S. 143-214.2** - Prohibits the discharge of wastes to surface waters of the state without a permit.
- **G.S. 143-214.5** - Provides for establishment of the state Water Supply Watershed Protection Program.
- **G.S. 143-214.7** - Directs the EMC to establish a Stormwater Runoff Program.
- **G.S. 143-215** - Authorizes and directs the EMC to establish effluent standards and limitations.
- **G.S. 143-215.1** - Outlines methods for control of sources of water pollution (NPDES and nondischarge permits, statutory notice requirements, public hearing requirements, appeals, etc.).
- **G.S. 143-215.1** - Empowers the EMC to issue *special orders* to any person whom it finds responsible for causing or contributing to any pollution of the waters of the state within the area for which standards have been established.
- **G.S. 143-215.3(a)** - Outlines additional powers of the EMC including provisions for adopting rules, charging permit fees, delegating authority, investigating fish kills and investigating violations of rules, standards or limitations adopted by the EMC.
- **G.S. 143-215.6A, 143-215.6B and 143-215.6C** - Includes enforcement provisions for violations of various rules, classifications, standards, limitations, provisions or management practices established pursuant to G.S. 143-214.1, 143-214.2, 143-214.5, 143-215, 143-215.1, 143-215.2. 6A describes enforcement procedures for civil penalties. 6B outlines enforcement procedures for criminal penalties. 6C outlines provisions for injunctive relief.
- **G.S. 143-215.75** - Outlines the state's Oil Pollution and Hazardous Substances Control Program.

## 5.3 Surface Water Classifications and Water Quality Standards

### Program Overview

North Carolina has established a water quality classification and standards program pursuant to G.S. 143-214.1. Classifications and standards are developed pursuant to 15A NCAC 2B. 0100 - Procedures for Assignment of Water Quality Standards. Waters were classified for their "best usage" in North Carolina beginning in the early 1950's, with classification and water quality standards for all the state's river basins adopted by 1963. The effort to accomplish this included identification of waterbodies (which included all named waterbodies on USGS 7.5 minute topographic maps), studies of river basins to document sources of pollution and appropriate best uses and formal adoption of standards/classifications following public hearings.

The Water Quality Standards program in North Carolina has evolved over time and has been modified to be consistent with the Federal Clean Water Act and its amendments. Water quality classifications and standards have also been modified to promote protection of surface water supply watersheds, high quality waters and the protection of unique and special pristine waters with outstanding resource values. Classifications and standards are applied to provide protection of uses from both point and nonpoint source pollution.

## Statewide Classifications

Appendix II summarizes the state's primary and supplemental classifications including, for each classification, the best usage, key numeric standards, stormwater controls and other requirements as appropriate. This information is derived from 15A NCAC 2B .0200 - Classifications and Water Quality Standards Applicable to Surface Waters of North Carolina.

### Primary Classifications

Under this system, all surface waters in the state are assigned a *primary* classification that is appropriate to the best uses of that water body (e.g., aquatic life support and swimming). Primary freshwater classifications include the following: *C*, *B* and *WS* (Water Supply) *I* through *WS-V*. The *WS* freshwater classifications may also include a *CA* designation which stands for critical area. The critical area is an area in close proximity to a water supply intake and/or the shoreline of the reservoir in which it is located. Primary saltwater classifications include *SC*, *SB* and *SA*. *SC* and *SB* are saltwater counterparts to the freshwater *C* and *B* classifications. *SA* is a classification assigned to waters used for shellfish harvesting. *SA*, *WS-I* and *WS-II* are also, by definition, considered to be High Quality Waters, as discussed below.

### Supplemental Classifications

In addition to primary classifications, surface waters may be assigned a supplemental classification. The supplemental classifications include *HQW* (High Quality Waters), *ORW* (Outstanding Resource Waters), *NSW* (Nutrient Sensitive Waters), *Tr* (Trout Waters) *FWS* (Future Water Supply) and *Sw* (Swamp Waters). Most of these have been developed in order to afford special protection to sensitive or highly valued resource waters. Therefore, while all surface waters are assigned a primary classification, they may also have one or more supplemental classifications. For example, a typical freshwater stream in the mountains might have a *C* *Tr* classification where *C* is the primary classification followed by the *Tr* supplemental classification.

## Statewide Water Quality Standards

Each primary and supplemental classification is assigned a set of water quality *standards* that establish the level of water quality that must be maintained in the water body to support the uses associated with each classification. Some of the standards, particularly for *HQW* and *ORW* waters, outline protective management strategies aimed at controlling point and nonpoint source pollution. These strategies are discussed briefly below. The standards for *C* and *SC* waters establish the basic protection level for all state surface waters. With the exception of *Sw*, all of the other primary and supplemental classifications have more stringent standards than for *C* and *SC* and therefore require higher levels of protection.

### High Quality Waters

Some of North Carolina's surface waters are relatively unaffected by pollution sources and have water quality higher than the standards that are applied to the majority of the waters of the state. In addition, some waters provide habitat for sensitive biota such as trout, juvenile fish or rare and endangered aquatic species.

In an effort to protect waters that possess such characteristics, surface waters in the following categories qualify for classification as High Quality Waters or *HQW*:

- 1) waters rated as Excellent based on chemical and biological sampling (Division of Water Quality (DWQ) assigns water quality ratings to North Carolina's surface waters based on biological and chemical data);
- 2) streams designated by the Wildlife Resources Commission as native and special native trout waters or primary nursery areas;
- 3) waters designated as primary nursery areas by the Division of Marine Fisheries; and

- 4) critical habitat areas designated by the Wildlife Resources Commission or the Department of Agriculture. Waters classified by the Division of Water Quality as WS-I, WS-II and SA are HQW by definition, but these waters are not specifically assigned the HQW classification because the standards for WS-I, WS-II and SA waters are at least as stringent as those for waters classified as HQW.

Special HQW protection management strategies are presented in 15A NCAC 2B.0201(d), and implemented through 15A NCAC 2B .0224. Copies of these rules can be found in Appendix II. These measures are intended to prevent degradation of water quality below present levels from both point and nonpoint sources. HQW requirements for new wastewater discharge facilities and facilities which expand beyond their currently permitted loadings address oxygen-consuming wastes, total suspended solids, disinfection, emergency requirements, volume, nutrients (in nutrient sensitive waters) and toxic substances.

For nonpoint source pollution, development activities which require an Erosion and Sedimentation Control Plan in accordance with rules established by the NC Sedimentation Control Commission or local erosion and sedimentation control program approved in accordance with 15A NCAC 4B .0218, and which drain to and are within one mile of HQWs will be required to control runoff from the development using either a low density or high density option described in 15A NCAC 2H. 1006. In addition, the Division of Land Quality requires more stringent sedimentation controls for land disturbing projects within one mile and draining to HQWs.

#### Outstanding Resource Waters

A small percentage of North Carolina's surface waters have excellent water quality (rated based on biological and chemical sampling as with HQWs) and an associated outstanding resource. The Outstanding Resource Waters rule defines outstanding resource values as:

- 1) outstanding fishery resource;
- 2) a high level of water-based recreation;
- 3) a special designation such as National Wild and Scenic River or a National Wildlife Refuge;
- 4) being within a state or national park or forest; or 5) having special ecological or scientific significance.

The requirements for ORW waters are more stringent than those for HQWs. Special protection measures that apply to North Carolina ORWs are set forth in 15A NCAC 2B .0225. At a minimum, no new discharges or expansions are permitted, and stormwater controls for most new development are required. In some circumstances, the unique characteristics of the waters and resources that are to be protected require that a specialized (or customized) ORW management strategy be developed.

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## 5.4 NORTH CAROLINA'S POINT SOURCE CONTROL PROGRAM

North Carolina does not allow point source discharges without a permit. Discharge permits are issued under the authority of North Carolina General Statute (NCGS) 143.215.1 and the National Pollutant Discharge Elimination System (NPDES) program. The NPDES program was delegated to North Carolina from the US Environmental Protection Agency. These permits serve as both state and federal permits. North Carolina has a comprehensive NPDES program which includes the permitting of both wastewater and stormwater discharges. Refer to Appendix VI for a full program description and Appendix I for the Organizational Duties Flow Chart for the DWQ Water Quality Section.

NPDES permits are issued in two categories; individual or general. Individual permits are issued to a specific facility and contain site specific requirements and incorporate recommendations from the basinwide water quality management plan. Individual NPDES permits are typically issued for

a five year cycle with all permits in a river basin expiring at the same time. This permitting strategy allows for comprehensive review of individual dischargers within the basin and implementation of recommendations contained in the basinwide water quality management plan. New discharge permits issued during an interim period are given a shorter cycle so that expiration coincides with the basin permitting cycle. Individual permits in the Hiwassee River basin are scheduled for expiration and renewal in December 1997.

General permits are developed for a general type of industry and contain permit requirements that are appropriate for a typical facility within a specific industrial classification. Facilities engaged in the specific industrial activities are eligible for permit coverage under the general permit. Facilities that are deemed to be atypical or have a history of water quality problems are required to obtain an individual permit. Because general permits are specific to a type of industrial activity and are issued statewide they do not contain basin specific measures. A general permit is typically issued for a five year cycle, which expires statewide on the same date.

#### 5.4.1 NPDES Permits for Wastewater Discharges

Under the NPDES wastewater permitting program, each NPDES discharger is assigned either *major* or *minor* status. For municipalities, all dischargers with a flow of greater than 1 million gallons per day (MGD) are classified as major. There is only one major discharger (Town of Andrews) in the Hiwassee River basin.

All new wastewater discharge permit applications must include an engineering proposal which includes a description of the origin, type, and flow of wastewater, a summary of waste treatment and disposal options, and a narrative description of the proposed treatment works and why the proposed system and point of discharge were selected. The summary must contain sufficient detail to assure that the most environmentally sound alternative was selected from the reasonably cost effective options. An assessment report describing the impact on waters in the area must be submitted for all applications of new discharges in excess of 500,000 gallons per day or 10 million gallons per day of cooling water or any other proposed discharge of 1 million gallons per day or more.

Under the NPDES program, wastewater treatment systems must be operated by a certified operator. Training and certification of operators is conducted by DWQ. It is the goal of the program to provide competent and conscientious professionals that will protect both the environment and public health.

The amount or loading of specific pollutants that are allowed to be discharged into surface waters are defined in the NPDES permit and are called *effluent limits*. Point source discharges generally have the most impact on a stream during low flow conditions when the percentage of treated effluent within the stream is greatest. Effluent limits are generally set to protect the stream during these low flow conditions. The standard low flow used for determining point source impacts is called the *7Q10*. This is the lowest flow which occurs over seven consecutive days and which has an average recurrence of once in ten years. Computer modeling may be used to determine the fate and transport of pollutants, reduction goals for contaminants, and to derive effluent limits for NPDES permits. A wasteload allocation is performed to ensure the effluent limits are set at levels that can be safely assimilated by the receiving stream.

Most dischargers are required to periodically sample their treated effluent. This process is called self-monitoring. Larger and more complex dischargers are also required to sample both upstream and downstream of the discharge point. NPDES facilities are required to monitor for all pollutants for which they have permit limits as well as other pollutants which may be present in their wastewater. Sampling results are submitted to DWQ each month for compliance evaluations. If

limits are not being met, various legal actions may be taken against the discharger to ensure future compliance.

All domestic wastewater dischargers are required to monitor flow, dissolved oxygen, temperature, fecal coliform, BOD, ammonia, and chlorine (if they use it as a disinfectant). In addition, wastewater treatment facilities with industrial sources may have to monitor for chemical specific toxicants and/or whole effluent toxicity, and all dischargers with design flows greater than 50,000 gallons per day (GPD) monitor for total phosphorus and total nitrogen. Minimum NPDES wastewater monitoring requirements are provided in 15A NCAC 2B .0500.

Other methods of collecting point source information include effluent sampling by DWQ during inspections and special studies. The regional offices may collect data at a given facility if they believe there may be an operational problem or as a routine compliance check. DWQ may collect effluent data during intensive surveys of segments of streams. Extensive discharger data have been collected during on-site toxicity tests.

A pretreatment program is aimed at protecting municipal wastewater treatment plants and the environment from the adverse impacts that may occur when hazardous or toxic wastes are discharged into a public system. This program requires that businesses and other entities that use or produce toxic wastes pretreat their wastes prior to discharging into a public wastewater system.

#### 5.4.2 NPDES Permits Stormwater Discharges

As currently defined by the NPDES program, stormwater point source discharges originate from two distinct sources; municipalities and selected industrial facilities. Subject municipalities are defined as those incorporated areas that encompass a population of 100,000 or more. There are currently no municipalities in the Hiwassee River basin that are subject to NPDES stormwater permitting.

Stormwater discharges directly related to manufacturing, processing or raw materials storage areas at industrial plants are also subject to NPDES stormwater permitting. A complete definition of "stormwater discharge associated with industrial activity" including a comprehensive listing of subject industries can be found in 40 CFR 122.26. The types of industrial activities that are subject to permitting are typically defined by Standard Industrial Classification (SIC) codes. SIC codes have been developed by the federal Office of Management and Budget to define industries in accordance with the composition and structure of the economy.

There are currently 19 general stormwater permits available for specific types of industrial activities across the state. In the Hiwassee River basin, all of the sixteen issued stormwater discharge permits are general permits. ~~These sixteen permittees fall into eight specific types of industrial activities covered by general permits.~~ As previously explained, the general permits define stormwater controls and monitoring for a typical facility within an industrial classification. General stormwater permits incorporate requirements determined to be appropriate based upon an analysis of available analytical monitoring data, input from industry and associations, site visits, and review of federal and other documents providing guidance on specific types of industries, pollutants and stormwater discharges.

General permits may specify monitoring and reporting requirements for both quantitative and qualitative assessment of the stormwater discharge as well as operational inspections of the entire facility, including all stormwater systems. The specific pollutant parameters for which sampling must be performed are based upon the types of materials used and produced in the manufacturing processes and the potential for contamination of the stormwater runoff at a typical facility.

All NPDES stormwater permits require the development and implementation of a Stormwater Pollution Prevention Plan (SPPP). The SPPP requires the permitted facility to develop a comprehensive stormwater management plan. This plan is the basis for evaluating the pollution potential of the site and implementing best management practices (BMPs) to reduce pollutants in runoff from the site.

All stormwater permits specify qualitative monitoring of each stormwater outfall for the purposes of evaluating the effectiveness of the Stormwater Pollution Prevention Plan and assessing new sources of stormwater pollution. Qualitative monitoring parameters include color, odor, clarity, floating and suspended solids, foam, oil sheen, and other obvious indicators of stormwater pollution.

Stormwater permits may provide for the use of cut-off concentrations in order to minimize the required analytical monitoring for facilities which are not significant contributors to stormwater pollution. These cut-off concentrations are not intended to be effluent limits (as used in wastewater permitting), but to provide guidelines for determining which facilities are major contributors to stormwater pollution and need further monitoring. The arithmetic mean of all monitoring data collected during the term of the permit must be calculated for each parameter and compared to the permitted cut-off concentration. If the mean is below the cut-off concentration, then the facility may discontinue analytical monitoring for that parameter until the final year of the permit. This approach inhibits facilities from using the cut-off concentrations as target concentrations for purposes of evaluating the effectiveness of the Stormwater Pollution Prevention Plan while ensuring that problem facilities continue to collect analytical information on their discharges.

## 5.5 NONPOINT SOURCE CONTROL PROGRAMS

When rainfall or snowmelt washes off an undisturbed natural area, it contains few pollutants and a significant portion of it infiltrates into the ground. This infiltration process cleanses, reduces and delays runoff. However, human disturbances of land often cause runoff of pollutants into surface waters. For instance, runoff from agricultural lands can include fertilizers, sediment and pesticides; runoff from roads and parking lots in urban areas can include petroleum products and toxic substances (these impervious surfaces also increase flow volume and velocity); construction activities can cause runoff of sediment, etc. These are examples of *nonpoint source* (NPS) pollution. Unlike effluent from a wastewater treatment plant, NPS pollution often originates from harder to identify, widely dispersed areas.

In addition to over-land runoff, some NPS pollution originates from the atmosphere, such as acid deposition. Some of the most common nonpoint sources of pollution and their causes are presented in Chapter 3.

The two approaches that are used to address nonpoint source pollution are prevention and engineered controls. Some of the methods of pollution prevention include minimizing built-upon areas, protection of sensitive areas, optimum site planning, use of natural drainage systems rather than curb and gutter, nutrient management plans, public/farmer education, storm drain stenciling, and hazardous waste collection sites. It is generally more cost-effective to prevent and minimize pollution than to build engineered controls. For example, developers who are subject to stormwater requirements often choose to build low density developments rather than bearing the expense of building engineered BMPs. Engineered BMPs also have on-going expenses associated with long-term operation and maintenance.

Engineered BMPs generally work by capturing, retaining, and treating runoff before it leaves an area. Some commonly used types of BMPs include stormwater wetlands, wet detention ponds, water control structures, bioretention areas, and infiltration basins. Often higher levels of pollutant

removal can be achieved by using a combination of different control systems. The main advantage of engineered controls is that they can treat runoff from high density developments.

The current trend is toward a more comprehensive "systems approach" to managing nonpoint source pollution. This involves using an integrated system of preventive and control practices to accomplish nonpoint pollution reduction goals. This approach emphasizes site planning, protecting important natural areas such as wetlands, and finding the most cost-effective engineered controls for high density areas. Programs which are currently using the systems approach include the animal waste regulations and the regulations for coastal stormwater management and water supply watersheds. In general, the goals of the nonpoint source management program include the following:

1. Continue to build and improve existing programs,
2. Develop new programs to control nonpoint pollution sources that are not addressed by existing programs,
3. Continue to target geographic areas and waterbodies for restoration and protection,
4. Integrate the NPS Program with other state programs and management studies (e.g., Albemarle-Pamlico Estuarine Study, Clean Water Trust Fund, Wetlands Restoration Program) and
5. Monitor the effectiveness of BMPs and management strategies, both for surface and groundwater quality.

Table 5.1 lists a number of federal and state programs that address nonpoint source pollution. These programs are listed by category based on the type of activity. A complete program description can be found in Appendix VI for nonpoint source control programs. Refer to Table 5.2 for a brief description of each program and the contact persons within the basin for each program.

Table 5.1 List of Nonpoint Source Programs

PROGRAM	LOCAL	STATE	FEDERAL
<b>AGRICULTURE:</b> Agriculture Cost Share Program N.C. Pesticide Law of 1971 Pesticide Disposal Program Animal Waste Management Laboratory Testing Services Watershed Protection (PL-566) 1985 ,1990 and 1995 Farm Bills - Conservation Reserve Program; Conservation Compliance; Sodbuster/Swampbuster; Conservation Easement; Wetland Reserve; Water Quality Incentive Program	SWCD  SWCD	SWCC, DSWC NCDA NCDA DWQ,DSWC, CES NCDA	NRCS  NRCS USDA
<b>URBAN</b> Coastal Stormwater Program ORW, HQW, NSW Management Strategies Water Supply Watershed Protection Program Stormwater Control Program	city, county city, county	DWQ DWQ DWQ DWQ	EPA
<b>CONSTRUCTION</b> Sedimentation and Erosion Control Coastal Area Management Act Coastal Stormwater Program	ordinance ordinance	DLR, DOT DCM DWQ	
<b>ON-SITE WASTEWATER DISPOSAL</b> Sanitary Sewage Systems Program	county	DEH	
<b>SOLID WASTE DISPOSAL</b> Resource Conservation and Recovery Act Solid Waste Management Act of 1989	city, county	DSWM	EPA
<b>FORESTRY</b> Forest Practice Guidelines National Forest Management Act Forest Management Program Services Forestry Best Management Practices Forest Stewardship Program		DFR  DFR DFR DFR	NFS
<b>MINING</b> Mining Act of 1971			DLR
<b>HYDROLOGIC MODIFICATION</b> Clean Water Act (Section 404) Rivers and Harbors Act of 1899 Dam Safety Permit		DCM, DWQ  DLR	COE COE
<b>WETLANDS:</b> Wetlands Restoration Program Clean Water Act (Sections 401 and 404) Wetland Reserve Program		DWQ DWQ	COE USDA

COE: US Army Corps of Engineers  
 DWQ: Division of Water Quality  
 DFR: Division of Forest Resource  
 DSW: Division of Soil and Water  
 USDA: US Department of Agriculture

DCM: Division of Coastal Management  
 DLR: Division of Land Resources  
 DOT: Department of Transportation  
 DSWM: Division of Solid Waste Mgt.

NCDA: NC Department of Agriculture  
 NRCS: Natural Resources Conservation Service  
 SWCC: Soil and Water Cons. Commission  
 SWCD: Soil and Water Conservation District

Table 5.2 Hiwassee River Nonpoint Source Program Description and Contacts

<b>Agriculture</b>			
<b>USDA Natural Resources Conservation Service -- Soil &amp; Water Conservation Districts:</b>			
Formerly the Soil Conservation Service; provides technical assistance for numerous issues, including:			
<ul style="list-style-type: none"> <li>• certifying waste management plans and training animal waste applicators;</li> <li>• helping farmers and ranchers to develop conservation systems suited to their individual land and business;</li> <li>• assisting rural/urban communities in reducing erosion, protecting water, and solving other resource problems;</li> <li>• conducting site evaluations and soil surveys;</li> <li>• administering the Agriculture Cost-Share Program and assisting landowners in installing BMPs; and</li> <li>• administering the Wetlands Reserve Program and offering technical assistance for wetlands determination.</li> </ul>			
Clay County	Clay Logan	704-389-9764	P.O. Box 57 Hayesville, NC 28904
Cherokee County	Richard Greene	704-837-6928	409 Valley River Ave. Suite J Murphy, NC 28906
<b>NC Division of Soil and Water Conservation:</b>			
Provides administrative and technical assistance to the Soil & Water Conservation Districts in areas pertaining to soil science and engineering; distributes Wetlands Inventory maps for a small fee. Administers the Agriculture Cost Share Program (ACSP).			
Central Office	Donna Moffitt (ACSP)	919-715-6108	512 N. Salisbury St. Raleigh NC 27626
Regional Office	Ralston James	704-251-6208	59 Woodfin Pl. Asheville, NC 28801
<b>NC Department of Agriculture (NCDA) Regional Agronomists:</b>			
Provides technical specialists for certifying waste management plans. Provides certified trainers for animal waste applicators training sessions. Tracks, monitors, and accounts for use of nutrients on agricultural lands. Identifies and evaluates the use of nutrient management plans.			
Central Office	Tom Ellis	919-733-7125	Box 27647 Raleigh, NC 27611
<b>NC Cooperative Extension Service:</b>			
Provides practical, research-based information and education programs to help individuals, families, farms, businesses and communities.			
Clay County	Terry King	704-389-6305	P.O. Box 1156 Hayesville, NC 28904
Cherokee County	Craig Mauney	704-837-2210	115 Peachtree St. Murphy, NC 28906
<b>Forestry</b>			
<b>NC Division of Forest Resources:</b>			
Develop, protect, and manage the multiple resources of North Carolina's forests through professional stewardship, enhancing the quality of our citizens while ensuring the continuity of these vital resources.			
Central Office	Mickey Henson	919-733-2162	P.O. Box 29581 Raleigh, NC 27626-0581
<b>S Department of Agriculture - US Forest Service:</b>			
Develop, protect and manage North Carolina's federal forest lands for multiple uses including sustainable timber harvest, recreation, and motorized vehicle access.			
Asheville Office	Richard Burns	704-257-4248	PO Box 2750 Asheville, NC 28802

Table 5.2 Hiwassee River Nonpoint Source Program Description and Contacts (Cont'd)

<b>General Water Quality</b>			
<b>NC DWQ Water Quality Section:</b>			
Control of water pollution from point sources such as municipal and industrial wastewater discharges, and from nonpoint sources that originate from agricultural drainage, urban runoff, land clearing, construction, mining, forestry, septic tanks and land application of waste; issues permits for both discharging and on-site wastewater treatment systems, conducts compliance inspections, operates an ambient water quality monitoring program, and performs a wide variety of special studies on activities affecting water quality; administers the 319 projects statewide.			
Central Office	Linda Hargrove (319 Projects)	919-733-5083	DWQ - Planning Branch, P.O. Box 29535 Raleigh NC 27626
Asheville Region	Forrest Westall	704-251-6208	59 Woodfin Pl. Asheville, NC 28801
<b>NC Wildlife Resources Commission:</b>			
To manage, restore, develop, cultivate, conserve, protect, and regulate the wildlife resources of the State, and to administer the laws relating to game, game and freshwater fishes, and other wildlife resources enacted by the General Assembly to the end that there may be provided a sound, constructive, comprehensive, continuing, and economical game, game fish, and wildlife program.			
Central Office	Frank McBride	919-528-9886	P.O. Box 118 Northside, NC 27564
Local Office	Mark Davis (?)	704-452-0422	Balsam Depot, Rt. 1, Box 624 Waynesville 28786
<b>U.S. Army Corps of Engineers:</b>			
Responsible for: investigating, developing and maintaining the nation's water and related environmental resources; constructing and operating projects for navigation, flood control, major drainage, shore and beach restoration and protection; hydropower development; water supply; water quality control, fish and wildlife conservation and enhancement, and outdoor recreation; responding to emergency relief activities directed by other federal agencies; and administering laws for the protection and preservation of navigable waters, emergency flood control and shore protection. Responsible for wetlands and 401 Water Quality certifications.			
Asheville Office	David Baker	704-271-4854	151 Patton Ave., Rm. 141 Asheville, NC 28801-5006
<b>NC DWQ Groundwater Section:</b>			
Groundwater classifications and standards, enforcement of groundwater quality protection standards and cleanup requirements, review of permits for wastes discharged to groundwater, issuance of well construction permits, underground injection control, administration of the underground storage tank (UST) program (including the UST Trust Funds), well head protection program development, and ambient groundwater monitoring.			
Central Office	Carl Bailey	919-733-3221	P.O. Box 29578 Raleigh, NC 27626-0578
Asheville Region	Don Link	704-251-6208	59 Woodfin Pl. Asheville, NC 28801

Table 5.2 Hiwassee River Nonpoint Source Program Description and Contacts (Cont'd)

<b>Construction/Mining</b>			
<b>NC Division of Land Resources:</b>			
Conducts inspections and protects the state's land and mineral resources. Administers the NC Sedimentation and Erosion Control Program.			
Central Office	Mel Nevills	919-733-4574	512 N. Salisbury St. Raleigh NC 27626
Asheville Region	Dennis Owenby	704-251-6208	59 Woodfin Pl. Asheville, NC 28801
<b>Solid Waste</b>			
<b>NC Division of Solid Waste Management:</b>			
Management of solid waste in a way that protects public health and the environment. The District includes three sections and one program -- Hazardous Waste, Solid Waste, Superfund, and the Resident Inspectors program.			
Asheville Region	Jim Patterson	704-251-6208	59 Woodfin Pl. Asheville, NC 28801
<b>On-Site Wastewater Treatment</b>			
<b>NC Division of Environmental Health:</b>			
Safeguards life, promotes human health, and protects the environment through the practice of modern environmental health science, the use of technology, rules, public education, and above all, dedication to the public trust.			
Services include:			
<ul style="list-style-type: none"> <li>• Training of and delegation of authority to local environmental health specialists concerning on-site wastewater</li> <li>• Engineering review of plans and specifications for wastewater systems 3,000 gallons or larger and industrial process wastewater systems designed to discharge below the ground surface</li> <li>• Technical assistance to local health departments, other state agencies, and industry on soil suitability and other site considerations for on-site wastewater systems.</li> </ul>			
Central Office - DEH	Steve Steinbeck	919-715-3273	2728 Capital Blvd. Raleigh, NC 27604
Clay County	Tim Birch	704-389-6301	P.O. Box 55 Hayesville, NC 28904
Cherokee County	Mike Thompson, Anthony Tipton or Kim McClain	704-837-7486	206 Hilton St. Murphy 28906

### 5.6 PROGRAM INITIATIVES IN THE HIWASSEE RIVER BASIN

Through the development of this plan, efforts were made to identify efforts that have been undertaken within the basin to protect water quality. The following discussion focuses on program initiatives that have been implemented or are underway within the Hiwassee River basin. These initiatives demonstrate a tremendous effort to protect surface waters in the basin. There may be other initiatives underway in the basin that we are not yet aware of. Table 5.3 presents a summary of the agency or organizations that have program initiatives in the basin.

Table 5.3 Program Initiatives in the Hiwassee River Basin

Level of Agency	Name of Agency	Type of Initiative
Federal	Southern Appalachian Assessment	Ecosystem, Social/Cultural/Economic and Atmospheric Conditions
	US Department of Agriculture - National Resource Conservation Service	Various Projects
	US Forest Service	Land and Resource Management Plan for the Nantahala National Forest
	US Forest Service - Coweeta Hydrologic Laboratory	Hydrologic Studies
	Southeastern Natural Resources Leaders Group	Interagency Project
State	NC Soil and Water Conservation District	Various Projects
	NC Cooperative Extension Service	Various Projects
	NC Department of Transportation	Road Construction Erosion Control
	NC Division of Forest Resources	Forest Practice Guidelines Best Management Practices Forest Management Program Services
	NC Division of Land Resources	Sedimentation Pollution Control Act Mining Act
	Southern Appalachian Mountains Initiative	Regional Partnership on Air Quality Issues
Local Govt. and Citizen Groups	Hiwassee Watershed Coalition	Various Projects
	Town of Murphy	Developed Hiwassee River Park
	Town of Andrews	Developed Tree Ordinance
	Clay County	Took Over Operations of WWTP
Corporate	Tennessee Valley Authority	Clean Water Initiative, Shoreline Management Initiative, Hiwassee River Action Team
	Duke Power	Total Suspended Solids and Total Phosphorous Studies
Regional Organizations and Commissions	Year of the Mountains Commission	Recommendations to Governor Relating to Natural Resource Protection

### **5.6.1 Federal Initiatives**

#### **The Southern Appalachian Assessment**

The Southern Appalachian Assessment (SAA) is a cooperative effort among many federal and state agencies and was conducted through coordination with the Southern Appalachian Man and Biosphere (SAMAB) program. The SAA began in the summer of 1994 and was completed in May 1996. Public meetings were conducted in the SAA study area (Figure 5.1) to get input from the public on specific issues. Several teams of professionals were formed to gather and interpret information about terrestrial and aquatic ecosystems, social/cultural/economic status, and atmospheric conditions for the SAA area. Full reports have been published on each of these categories (SAMAB 1996).

While the findings of the SAA are based on information to be used at a larger scale than a single river basin, some of the key findings of the SAA pertaining to water quality are notable here. Of particular interest to the Hiwassee River basin are the findings related to acid deposition and its effects on the aquatic ecosystem. While overall atmospheric sulfate concentrations seem to be decreasing, so too is the ability of the aquatic systems to buffer the incoming acidity (SAMAB 1996). This program and issue is discussed further in Chapter 4.

#### **U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS)**

- NRCS has developed several prototypes of trout waste management systems using Agriculture Cost Share Funds. One of these projects is the first trout waste spray irrigation system in the state. Another farm, located in the Savannah basin on Thompson River, has retrofit its existing trout raceways with baffles and computer actuated valves to collect waste and uneaten food. These trout waste management facilities exceed the requirements of the law; however, managing this type of waste is important to protecting water quality in this part of the state.
- NRCS is initiating "critical area treatment", the control of sediment by vegetating areas that show serious erosion problems. Many of their critical areas include highway corridors.
- NRCS and the SWCD have a partnership with Duke Power to protect the company's 6,000 acre "auger hole area." Previously, the unsupervised use of off-road vehicles in this area caused serious erosion problems. Now, the area is closely supervised and the property has been stabilized and seeded. The roads have also been stabilized with gravel.
- A federal Farm Bill program administered by the NRCS provides an incentive not to farm on highly erodible land (HEL) by taking away federal subsidies from a farmer that fails to comply with the provision.

#### **US Forest Service - Land and Resource Management Plan (Amendment 5) for Nantahala-Pisgah National Forests**

The US Forest Service released the Land and Resource Management Plan Amendment 5 in April 1994. Amendment 5 is a major revision to the 10-year 1987 forest plan established to manage the 1.2 million acres of Nantahala-Pisgah National Forests in North Carolina. The revised plan was in response to public concerns over past forest management practices. The new forest service approach applies the principles of ecosystem management; fostering old growth forests, neotropical bird habitat, and biodiversity; reducing clearcutting activities by providing a wood product supply that is sustainable and cost-effective; and maintaining forest aesthetics.

The 1994 amendment reduces the clearcutting rate from 1,500 acres per year to 240 acres per year. Under the new plan, total timber harvested will be reduced by 50% with a reduction from 72 million board feet annually to 34 million board feet. In addition, the primary method of harvesting trees shifted away from clearcutting to shelterwood (2-age) regeneration and selection harvesting in 1990. The two-age shelterwood harvest method allows 15 to 40 percent of the trees to grow,



creating a stand with at least two ages of trees. Selective harvesting allows for groups of trees averaging one acre in size or less to be removed. Harvested acres and percent of total acreage per county in the basin can be found in Chapter 2 of this plan. Total harvest activities on the Nantahala and Pisgah National Forests as an annual percentage of total National Forest acres has gradually declined from 44% in 1990 to 26% in 1995.

In using this new approach, the US Forest Service has identified transportation system management standards (Appendix VII) in an effort to reduce water quality problems due to roads. Implementation of these standards in all National Forests should help reduce sedimentation due to roads. The US Forest Service is also testing the effectiveness of BMP's to reduce sedimentation from roads (Burns, 1994).

### Southeastern Natural Resources Leaders Group (SENRLG)

SENRLG is an association of regional managers from federal agencies with natural resource management responsibilities. SENRLG has four main purposes: 1) to broaden the perspective of regional natural resource leaders on economic, social, political and environmental issues and trends and their implications for natural resource programs; 2) to further develop community, constituency and agency support for natural resource activities; 3) to establish and maintain an interagency network of natural resource managers; and 4) to collaborate on specific activities of mutual interest which enable the Federal natural resource agencies to more effectively carry out their missions and responsibilities.

SENRLG has chosen the Hiwassee River watershed in North Carolina, Georgia and Tennessee as a demonstration watershed. A working group has been formed to coordinate the various activities of federal agencies in this watershed. The proposed North Carolina waterbodies for fiscal year 1997 activities include Shuler Creek (streambank stabilization) and Brasstown Creek (survey for potential restoration activities).

For more information on the Hiwassee Interagency Working Group, contact Janice Cox with TVA at (423) 751-7337.

### **5.6.2 State Agency Initiatives**

#### NC Division of Soil and Water Conservation

The NC Division of Soil and Water Conservation administers the *NC Agriculture Cost Share Program for Nonpoint source Pollution Control (NCACSP)*. This program provides incentives to farmers to install best management practices (BMPs) by offering to pay up to 75% of the average cost of approved BMPs. The NC Agriculture Cost Share Program funding totals for the Hiwassee River basin from 1985 through 1995 is \$121,497. The cost share figures include a wide array of BMPs including conservation tillage, crop conversion to grass or trees, critical area plantings, sod-based rotation, land application of animal waste, diversions, livestock exclusion, grade stabilization structures, and animal waste management systems.

- Through the Agriculture Cost Share Program, agricultural land in these basins has 45% compliance with required BMPs for livestock stream crossings and 84% compliance with other BMPs.
- The Clay and Cherokee County Soil and Water Conservation Districts have developed over 250 agricultural related water quality plans and implemented 90% of them, covering over 25,000 acres.

### **NC Cooperative Extension Service**

- The Cooperative Extension Service works with the NRCS on trout farm projects. They have an aquacultural specialized agent who helps trout farmers to address waste management problems. (Contact Skip Thompson, 704-456-3575)
- The CES has produced an educational booklet and cassette titled "Tobacco Scouting Manual" that instructs farmers about how to determine if pesticide applications are necessary. The material is easy to understand and using this program reduced pesticide use up to 40% for those who have implemented it. This program not only saves the environment, it saves money. (Contact Alan Caldwell, 704-757-1290)
- The CES has a comprehensive natural resources education program for children and adults. Some of the components of this program include Project Learning Tree, Teacher education, and field days (four each year). (Contact Craig Mauney, 704-389-6305)
- The CES also facilitates recycling and composting programs as well as Community Development Groups which clean up unattractive, bare urban areas.

### **NC Department of Transportation**

- DOT uses intensive erosion controls for road construction in mountain areas. Some of the practices they use include working on only a small portion of roadway at once, seeding and mulching immediately after construction, and using straw bales in addition to the required silt fences.
- DOT's Transportation Improvement Program calls for paving all gravel roads by the year 2002. This will eliminate sediment runoff from gravel roads which is one of the biggest contributors of sediment in the basin.
- Anakeesta rock formations are sometimes found as underlying rock in the Hiwassee River basin. As explained in Chapter 4, this type of rock formation can cause serious water quality impairment when the rock is disturbed and exposed to air and water. DOT geotechnical staff do exploratory drilling for Anakeesta early in the stages of road planning to allow time for road alignment to minimize contact with the rock. DOT implements two primary management strategies to reduce the potential for leachate from the rock surfaces from entering surface waters. These strategies include: 1) removing waste rock from the site and placing on DOT property in clay liners that are encapsulated or using as road fill materials and encapsulating with the paved surface; or 2) creating wetlands areas downstream of the site to allow wetland plants to reduce the acidity of the water before entering a surface water. Using this method, a series of dams are built with Gabion baskets to catch overflow. The dams are filled and islands are built within the pond. Riparian vegetation is planted around the wetland.
- Where there is the potential for water quality degradation due to unavoidable disturbance with Anakeesta rocks, stream sites are monitored for water quality changes over time. Monitoring is coordinated with the US Army Corps of Engineers, the Department of Environmental Health, the US Fish and Wildlife Service and private consultants. Streams are monitored at least one year in advance of construction for baseline data. The streams are monitored throughout construction and then for one year after construction is complete.

### **NC Division of Land Resources**

The NC Division of Land Resources (DLR) is responsible for administering the Sedimentation Pollution Control Act of 1973 (SPCA). Since the inception of the SPCA, the Sedimentation Control Commission has funded extensive workshops and educational programs aimed at children throughout the state. During fiscal year 1996, the DLR conducted workshops and symposiums, funded research and intern programs, reprinted manuals and developed video modules and produced newsletters on a budget of over \$270,000 for the entire state. The DLR has the following materials available.

- Erosion and Sediment Control Field Manual
- Erosion and Sediment Control Practices: Video Modules
- Erosion and Sediment Control "Inspector's Guide"
- Erosion and Sediment Control Planning and Design Manual
- "Erosion Patrol" Package for Grade 3

The DLR is also responsible for administering the Mining Act of 1971. The mining program currently has the "Surface Mining Manual" available to the public. This manual covers the requirements of the Mining Act and for final reclamation of the site. The DLR has conducted mine operator workshops, has a reclamation awards program in place and has calendared "Surface Mining Manual" workshops.

### NC Division of Forest Resources

The DFR is implementing various measures for protecting water quality statewide. These measures include the continued implementation of the Forest Practice Guidelines (FPGs) Related to Water Quality of 1976 and Best Management Practices (BMPs) of 1987. The FPGs have mandatory performance standards that must be met in order for landowners to remain exempt from all of the requirements associated with the Sedimentation Pollution Control Act enforced by the Division of Land Resources.

The FPG requirements include:

- establishment of a Streamside Management Zone,
- prohibition of debris entering streams,
- access and skid trail stream crossing protection measures,
- access road entrance restriction,
- prohibition of waste entering streams,
- waterbodies, and groundwater,
- pesticide and fertilizer application restrictions, and
- rehabilitation of project site requirements.

Overall compliance with Best Management Practices (BMP) in the Hiwassee River basin has been very good. Permanent logging roads in the basin avoided sensitive areas, met grade specifications, crossed streams properly, and BMPs were used and prevented sediment from reaching the stream. Skid trails and temporary roads in the basin had minimized and correct stream crossings, BMPs were used and prevented sediment from reaching the stream, water bars were evident and working 50% of the time. Streamside Management Zones (SMZs) in the basin were usually free of activity, ground cover was adequate, and the stream was clear of debris. However, SMZs met Forest Practice Guidelines (FPG) requirements only 17% of the time. All landings were in good shape.

Landings were free of oil/trash, were located outside of the SMZ, were on a well-drained location, and were adequately stabilized.

Refer to Appendix V, page A-V-14 for a complete list of FPG requirements.

### Southern Appalachian Mountains Initiative (SAMI)

Research and monitoring in national parks and national forest wilderness areas of the Southern Appalachian Mountains have documented adverse air pollution effects on visibility, streams, soils, and vegetation. Beginning in 1990, the Federal Land Managers for Shenandoah National Park, Great Smoky Mountains National Park, and Jefferson National Forest/James River Face Wilderness Area made several adverse impact determinations in the review of proposed air permits for major new sources of air pollution. These actions led to the voluntary formation of a regional public-private partnership called the Southern Appalachian Mountains Initiative (SAMI) in 1992. Now a nonprofit organization, SAMI's goal is to provide a regional strategy for assessing and

improving air quality, based on sound science and data, to protect this unique and sensitive ecosystem.

SAMI is a partnership of more than 100 agencies, including eight state environmental regulatory agencies (AL, GA, KY, NC, SC, TN, VA, and WV), several federal agencies, industries, academia, environmental organizations, and other stakeholders across the region. SAMI addresses the public, policy, and technical aspects of air quality issues through the consensus-building efforts of three main advisory committees comprised of leading scientific experts, as well as corporate, citizen and government stakeholders. SAMI gives affected states, federal agencies, regulated industry and the public an opportunity to broadly debate environmental issues and to propose reasonable solutions to identified problems, based on available science.

Since its formation in 1992, SAMI has operated with limited funding from the EPA and state regulatory agencies and countless in-kind contributions from all participants. By pooling regional resources, SAMI has worked to identify, gather, and evaluate all existing data, models, and studies to establish a foundation of current knowledge and identify critical information gaps. SAMI is now finalizing the design for an integrated assessment framework (IAF) that will project the environmental and socioeconomic responses to changes in air emissions. This tool will be useful to decision-makers in evaluating the costs and benefits to society and the environment of the 1990 Clean Air Act Amendments (CAAA) and selected emission management options.

The IAF is divided into six linked areas of concern: (1) base year emission inventory, emissions projections and control costs, (2) atmospheric transport and air chemistry, (3) effects of acid deposition on aquatic and terrestrial resources, (4) effects of ozone deposition on terrestrial resources, (5) effects of visibility degradation, and (6) socioeconomic consequences.

The entire integrated assessment is projected to cost about \$3 million overall and should be completed June 1998. SAMI peer-reviewed reports have been compiled on the following topics which describe the current state of knowledge as it pertains to air quality related values of the Southern Appalachian region: (1) emission inventories, (2) atmospheric transport and air chemistry, (3) acid deposition effects to aquatic resources, (4) acid deposition effects to terrestrial resources, (5) ozone effects to terrestrial resources, (6) visibility degradation, and (7) IAF design. During this information gathering phase, SAMI collaborated with other organizations with similar regional concerns to avoid duplication of efforts.

In order to evaluate how changes in emissions will affect natural resources, SAMI is establishing an emission-response relationship for the entire SAMI region by a series of computer model runs. By first characterizing an emission-response "surface," SAMI hopes to produce an analytical tool that can be used by decision makers to estimate the benefits and costs of custom "what if" emission management scenarios. Currently, SAMI is attempting to determine what pollutants and magnitude of emissions reductions will be necessary to detect a change at the resource (receptor) of concern.

For instance, work in the acid deposition area is occurring in two phases. The first phase focuses on understanding how selected sensitive receptors might respond to changes in deposition levels of sulfate and nitrate using indicators, such as soil solution chemistry, stream water quality, vegetation nutrient content, or forest productivity. Of particular interest to this basinwide report, Noland Divide in Swain County, North Carolina (having tributaries to the Little Tennessee River) has been selected as one of three targeted watersheds for this scope of work. The second phase will take a more regional approach to assessing resource responses to changes in deposition and will use indicators that are more meaningful to the general public, such as acres of forests that are healthy or miles of streams that support fish. Work in the other IAF areas of concern is proceeding concurrently or in phases, as appropriate.

Upon completion of this project, SAMI will have accomplished several things: a better understanding of the current health of the ecosystem (baseline); a projection of the changes in ecosystem health due to the CAAA; an idea as to whether or not such changes are enough to protect and preserve the air quality related values of the region; an evaluation of many options for reducing emissions (appropriateness, cost effectiveness, environmental benefit, etc.); better working relations among government, industries, and public interest groups; and recommendations for managing air quality in the Southern Appalachians.

SAMI has undertaken a task of monumental proportions with enormous implications for future economic development and environmental sustainability. The most extraordinary aspect of SAMI is that it is a voluntary effort not required by federal nor state statutes. This is truly the first attempt to define an equitable and objective process for addressing complex environmental issues fraught with uncertainties. It is hoped that this process will stimulate efforts to develop cost-effective, innovative and flexible solutions to balance future economic growth with environmental protection.

The above summary was excerpted from chapter titled: "Air Quality Management: A Policy Perspective", in J. Peine et. al., In Press..

### **5.6.3 Local Government and Citizen Initiatives**

#### **Hiwassee River Watershed Coalition**

The Hiwassee River Watershed Coalition is a local organization with representatives from North Carolina and Georgia, the four counties of Clay, Cherokee (N.C.), Towns and Union (GA.), three Soil and Water Conservation Districts (Blue Ridge Mountain, Clay County and Cherokee County), several towns (Andrews, Hayesville, Murphy (all N.C.) and Hiwassee, Young Harris, Blairsville (all GA) and individuals, businesses and organizations throughout the basin. A Memorandum of Agreement was signed in June 1994 to form the basis of cooperation and coordination for these Soil and Water Conservation Districts and county commissions. Initial funding for the Coalition came from each district and counties.

The goal of the organization is to increase emphasis on improving water quality for recreation use, water supply, fishery and wildlife habitat and other associated environmental amenities in the watershed above the Hiwassee Dam. The Coalition would like to oversee and coordinate watershed planning and water quality efforts throughout this portion of the watershed in NC as well as the upper Hiwassee watershed in GA. (42% of the Hiwassee River watershed is in GA). The mission of the coalition is to develop and implement a total watershed-water quality plan for the Upper Hiwassee River. The Coalition is promoting and encouraging quality growth and development while maintaining a quality environment.

The Coalition is working with GA and N.C. state wildlife biologists and the TVA River Action Team (see Corporate Initiatives below) to develop a Lake Chatuge Fisheries/Water Quality Plan.

A public opinion survey developed by the Coalition and sponsored by the Cooperative Extension Service was sent to 800 randomly selected citizens in the four county area of the upper Hiwassee watershed (Clay and Cherokee counties in NC and Union and Towns counties in GA). The purpose of the survey was to determine the interest level of the citizens regarding water quality issues and to gauge public perceptions of the severity of water quality problems and sources of these problems. The survey resulted in a 29.8% response rate (238 responses). The survey results suggest that the citizens of the area appreciated natural beauty and opportunities for outdoor recreation, but they are concerned about rapid development, poor construction activities and emerging water quality problems.

The Coalition has recently received Section 319 grant money to hire a full-time coordinator to provide administrative and educational assistance in both Georgia and North Carolina.

#### Water Quality Improvement Projects

The Coalition, in coordination with the Clay County Soil and Water Conservation District, the TVA Hiwassee River Action Team, and the USDA Natural Resources Conservation Service established a demonstration site on Blair Creek. The demonstration site is intended to stabilize streambanks using a "vortex rock weir". The weir dissipates the flow of water as a natural curve would do (the stream has been straightened). The Coalition has been involved in other streambank stabilization projects.

For more information about the Hiwassee Watershed Coalition, contact Hayesville, NC office at (704) 389-9764.

#### Town of Murphy

- Obtained an Urban Forestry Grant from the NC Division of Forest Resources to create the Hiwassee River Park in a previously run-down, bare area.
- The town has problems with Inflow/Infiltration to the wastewater system and there have been problems at the Iceplant Lift Station. The town is currently on a moratorium for sewer hook-ups. The town is working with McGill Associates to address these problems. This should be accomplished within a couple of years.

#### Town of Andrews

- Implements a Tree Ordinance that requires that bare areas be covered.
- The town has problems with Inflow/Infiltration to the wastewater system, along with many other infrastructure problems. There are no funds to correct these problems. The town hopes to obtain grant funding to update their infrastructure.

#### Clay County

Clay County took over operations of the wastewater and water treatment previously operated by the Town of Hayesville. Because of infrastructure problems, Hayesville was no longer able to provide these services. Hayesville is now at plant capacity, so the county is proposing to build a new treatment plant and install two large aeration lagoons. Hopefully this will get failing septic tanks onto an improved treatment facility. The new facility will improve discharge quality over the previous facility.

### **5.6.4 Corporate Initiatives**

#### Tennessee Valley Authority Clean Water Initiative

The goal of the Tennessee Valley Authority (TVA) Clean Water Initiative is to develop a partnership approach to preventing and cleaning up pollution on the Tennessee River and its watershed. In North Carolina, the Watauga, French Broad, Little Tennessee and Hiwassee River basins make up portions of the Tennessee River basin watershed. TVA is working with other agencies to identify pollution problems and implement solutions. TVA is looking for answers to key questions such as: If the water safe for swimming? Are the fish safe to eat? What is the health of the lake? Answers to these questions have been provided to the public in the form of an annual report called, RiverPulse. The RiverPulse report has recently been replaced by a fold-out brochure. A brochure is prepared for each river basin of the Tennessee Valley.

TVA has developed a very comprehensive monitoring program that combines the professional expertise of water resource specialists with local citizens, interest groups, business and industry, and other governmental agencies. This is the baseline for the concept of River Action Teams (RAT's). Water quality data collected from key locations on lakes and streams in the Tennessee River watershed is used to draw attention to pollution problems, set cleanup goals, and measure the effectiveness of water quality improvements over time. Measurements on water quality are based on physical, chemical, and biological variables. There are four RAT sites in the Hiwassee River basin. The results of this monitoring can be found in Chapter 4.

For more information on the TVA Clean Water Initiative contact: Wayne Poppe at (423) 632-8502 or Vicki Warren at (423) 632-3034.

For more information on the Hiwassee River Action Team contact: Jim Hagerman at (423) 632-1822 or Janice Cox at (423) 751-7337.

Lakes in the Hiwassee River basin are operated and managed by TVA. Lake shorelines are under severe pressure from residential development. TVA has recognized the need to control the development of lake shorelines to preserve their aesthetic quality and to reduce the potential for shoreline erosion. The Shoreline Management Initiative (SMI) was launched in 1994 to establish policy to protect shoreline and aquatic resources while allowing adjacent residents reasonable access to the water. TVA requested comments during the scoping phase of the SMI from other agencies and the public. With this feedback, TVA developed a Draft Environmental Impact Statement (DEIS) to examine the issues and alternatives of the expressed viewpoints and alternatives. At the time of writing, the DEIS was out for public review and comment.

Key issues identified in the scoping process are Resource Issues (shoreline vegetation, wetlands, aquatic habitat, water quality, etc.) and Other Public Issues (education and communication, land use rights, enforcement/patrol and design standards). Six alternatives that focus on such activities as dredging and filing, soil erosion, pollution, increased human presence on shoreline areas,, and construction of buildings, piers, etc. are presented in the DEIS.

For more information on the TVA Shoreline Management Initiative contact: David Harrell at (423) 632-1636.

### **Duke Power**

Duke Power Company is the major hydroelectric power generating industry in western North Carolina. Crescent Resources and Nantahala Power and Light are both subsidiaries of Duke Power Company. Duke Power is involved in transmission line construction activities which include clearing of tower sites and upgrading access roads. With the purchase of the subsidiaries over one hundred miles of transmission lines were constructed.

These transmission line activities can increase the potential for erosion and sedimentation which can have an impact on water quality. One water quality monitoring program developed by Duke Power focuses on streamflow total suspended solids (TSS) and Total Phosphorous (TP). Monitoring sites have been established at over 40 sites in western North Carolina. Discussion on the findings of this program as they pertain to the Hiwassee River basin can be found in Chapter 4.

The goals of the Duke Power monitoring program are to assess the effects of BMP's and sediment control plans developed and implemented by Duke Power, and to estimate transport to reservoirs. The program is designed to also identify the extent and source of pre-existing impacts (Braatz 1994).

Depth-integrated composite samples collect baseflow conditions and a series of vertical single-stage samplers are used to collect water samples representative of the rising stage of storm events. As the stream rises due to rainfall or snowmelt, stream water from several stages of the rising flow collects in the sample bottles. In this way, under the rising stage storm event, water samples are collected that represent the worst-case sediment loads to a stream (i.e. - when flow is rising and runoff is greater). Any impacts from Duke Power transmission line activities can be compared to control areas (upstream versus downstream) to paired watersheds, or by time series changes (before, during, and after site activity).

Results from sampling devices are collected on a regular basis and analyzed for TSS and TP. This information is provided to the field crews if impacts from Duke Power activities are documented. Thus, field crews are given quick feedback on where remediation efforts need to be implemented to correct sedimentation problems and protect water quality.

For more information on the Duke Power Stream Sediment Transport Program contact: Dave Braatz at 704-875-5430. For more information on the Duke Power Erosion and Sedimentation Control Program contact: Jim Hollifield at (704) 382-3509.

### **5.6.5 Regional Organizations and Commissions**

#### **Year of the Mountains Commission**

The Year of the Mountains Commission was created and organized under an Executive Order in March 1995 by Governor James B. Hunt. The work plan of the Commission was fashioned after the work of the "Year of the Coast" Commission. The objectives of the Commission were to: 1) Educate, promote and celebrate the distinctive natural and cultural heritage of the WNC communities and region; and 2) Develop and market public policy goals which can address the issues of quality growth and development, natural resource protection, and preservation of the cultural identity of the WNC mountain region. The recommendations of the Commission were presented to the Governor at the final conference of the Commission in June 1996. The Commission was dissolved as of June 30, 1996.

The Commission's recommendations are presented in Section 6.1 of Chapter 6.

### **5.7 Integrating Point And Nonpoint Source Pollution Control Strategies**

Integrating point and nonpoint source pollution controls and determining the amount and location of the remaining assimilative capacity in a basin are key long-term objectives of basinwide management. The information is used for a number of purposes including: determining if and where new or expanded municipal or industrial wastewater treatment facilities can be allowed; setting the recommended treatment level at these facilities; and identifying where point and nonpoint source pollution controls must be implemented to restore capacity and maintain water quality standards.

#### **Total Maximum Daily Loads**

The U.S. Environmental Protection Agency (USEPA) has developed the means to help accomplish these objectives called *total maximum daily loads (TMDL)*. USEPA requires the TMDL approach pursuant to Section 303(d) of the Clean Water Act. The approach uses the concept of determining the total waste (pollutant) loading from point and nonpoint sources that a waterbody (such as a stream, lake or estuary) can assimilate while still maintaining its designated uses.

TMDL's are part of a process in which States identify waterbodies that do not meet water quality standards, establish priorities for action, and determine reductions in pollutant loads or other actions needed to meet water quality goals. This information is submitted to USEPA for approval every two years. The approach is flexible and promotes a watershed approach driven by local needs and States priorities. The TMDL approach emphasizes priority waters and real world solutions.

The TMDL strategy establishes water quality-based controls on point and nonpoint sources of a given pollutant identified as contributing to a waterbody's impairment. The TMDL can reflect quantifiable limits placed on specific pollution sources or it can be programmatic strategies (e.g., implementation of nonpoint source best management practices) established to reduce pollutant loadings in the targeted waterbody. The overall goal in establishing the TMDL is to establish the management actions necessary for a waterbody to meet water quality standards.

A targeted waterbody does not necessarily refer to an entire basin. In the Cape Fear River Basin, for example, there are several major drainage areas (e.g., Deep River, Haw River and Cape Fear River) for which individual TMDLs are being recommended. TMDLs for smaller streams may also serve as important elements in a TMDL covering a larger portion of the basin. Nesting of TMDLs in this fashion constitutes a flexible yet comprehensive management approach that allows for the development of specific strategies for smaller problem areas and yet offers the means to address the large scale problems as well.

As DWQ's abilities to quantify and predict the impacts of point and nonpoint source pollution becomes more sophisticated, the basinwide approach in the Hiwassee River basin will make more innovative management strategies possible.

#### Other Possible Strategies

- *Industrial recruitment mapping* involves providing specific recommendations on the types of industry and land development best suited to the basin's long-term water quality goals and an individual basin's ability to assimilate a particular type or quantity of discharge or nonpoint source pollutants.
- *Consolidation of wastewater discharges*, also referred to as regionalization, entails combining several dischargers into one facility. Local authorities, regulated industries, landowners, and other interested parties are encouraged to provide ideas to develop these strategies. By accommodating, to the degree possible, local needs and preferences, the probability of the plan's long-term success will be increased.

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## **5.8 POTENTIAL SOURCES OF FUNDING FOR WATER QUALITY PROJECTS**

### **Section 319(h) Grants:**

Clean Water Act Section 319(h) grant monies are made available to the states on an annual basis by EPA. Agencies in the state that deal with NPS problems submit proposals to DWQ each year for use of these funds in various projects. Projects that have been funded in the past include BMP demonstrations, watershed water quality improvement projects, data management, educational activities, modeling, stream restoration efforts, riparian buffer establishment, and others. DWQ established a Workgroup process in 1995 for prioritizing and selecting projects from the pool of cost-share proposals and includes this list in its annual application to EPA. The Workgroup consists of representatives from the state and federal agencies that deal with NPS issues, including agricultural, silvicultural, on-site wastewater, mining, solid waste and resource protection.

DWQ staff first reviews proposals for minimum 319 eligibility criteria such as:

- Does it support the state NPS Management Program milestones?
- Does the project address targeted, high priority watersheds (See Table 5.4)?
- Is there sufficient nonfederal cost-share match available (40% of project costs)?
- Is the project period adequate?
- Are measurable outputs identified?
- Is monitoring required? Is there a QA/QC plan for monitoring?
- If GIS is used, is it compatible with those of the state?
- Is there a commitment for educational activities and a final report?

Workgroup members separately review and rank each proposal which meets the minimum 319 eligibility criteria. In their review, members consider such factors as: technical soundness; likelihood of achieving water quality results; degree of balance lent to the statewide NPS Program in terms of project type; and competence/reliability of contracting agency. They then convene to discuss individual projects' merits, to pool all rankings and to arrive at final rankings for the projects. The Workgroup seeks a balance between geographic regions of the state and types of projects. All proposals that rank above the funding target are included in the annual grant application to EPA, with DWQ reserving the right to make final changes to the list. Actual funding depends on approval from EPA and yearly Congressional appropriations.

While it is preferable that 319(h) proposals address high or medium priority watersheds, it is not necessary.

Table 5.4 Nonpoint Source (NPS) 319 Priority Ratings for Non-Coastal Waters

<p><b>High priority waters</b></p> <ul style="list-style-type: none"><li>• monitored waters that have an overall use support rating of non-supporting,</li><li>• monitored waters that have a use support rating of partially supporting but have a high predicted loading for one or more pollutants,</li><li>• highly valued resource waters as documented by special studies<ul style="list-style-type: none"><li>- High Quality Waters</li><li>- Outstanding Resource Waters</li><li>- Water Supply I, Water Supply II, Critical areas of WS-II, WS-III or WS-IV</li></ul></li></ul> <p><b>Medium priority waters</b> (None in the Savannah River basin):</p> <ul style="list-style-type: none"><li>• monitored waters that have an overall use support rating of partially supporting,</li></ul> <p><b>Low priority waters:</b></p> <ul style="list-style-type: none"><li>• All other waters not considered high or medium priority</li></ul>
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All proposals that rank above the annual funding target are included in the grant application to EPA, with DWQ reserving the right to make final changes to the list. Obtaining the funding depends on approval from EPA and yearly Congressional appropriations. To obtain more information about applying for section 319(h) grants, contact:

Linda Hargrove, DWQ - Planning Branch  
P.O. Box 29535, Raleigh, NC 27626-0535  
(919) 733-5083 ext. 352

**Other Sources of Funding**

Besides Section 319(h) funding, there are numerous sources of funding for all types of water quality projects. The sources of funding include federal and state agencies, nonprofits, and private funding. Funds may be loans, cost-shares, or grants.

If a local government, environmental group, university researcher, or other individual or agency wants to find funding to address a local water quality problem, it is well worth the time to prepare a thorough but concise proposal and submit it to applicable funding agencies. The list of goals for Section 319(h) proposals can be used as a guideline for other funding agencies. Even if a project is not funded, persistence may be beneficial when funding agencies observe several consecutive proposals from the same group.

Tables 5.5 and Appendix VIII provide summaries of the agencies that are potential sources of funds for point sources of pollution. Table 5.6 and Appendix IX provide summaries of the agencies that are potential funding sources for nonpoint sources of pollution.

In addition to these sources, the Clean Water Management Trust Fund will be another source of funding for both point and nonpoint sources of pollution. The 1996 General Assembly earmarked 6.5% annually of the year end General Fund credit balance to help finance projects that address water pollution problems and focus on upgrading surface waters, eliminating pollution and protecting and preserving unpolluted surface waters. Contact the Executive Director, Dave McNaught at 919-974-5497 and refer to Appendix VI for more details on this program.

Table 5.5 Funding Agencies for Assistance With Point Sources

Source	Agency and Name of Funding Source
Federal	<u>U.S. Rural Utilities Service:</u> Water and Wastewater Loan and Grant Program <u>Rural Business and Cooperative Service:</u> Rural Business Enterprise Grants <u>Appalachian Regional Commission:</u> Supplements to Other Federal Grants in Aid <u>U.S. Economic Development Administration:</u> Public Works and Development Facilities Grant Program
State	<u>NC Division of Water Quality:</u> <del>Construction Grants and Loans Program</del> <u>NC Division of Community Assistance:</u> Small Cities Community Development Block Grant <u>NC Commerce Finance Center:</u> Industrial Development Fund
Private	<u>Rural Economic Development Center, Inc.:</u> Supplemental and Capacity Grants Program

Table 5.6 Funding Agencies for Assistance with Nonpoint Sources

NPS Assistance Needed	Name of Funding Source
Agriculture	NC Agriculture Cost Share Program for NPS Pollution Control (NCACSP) Environmental Quality Incentives Program (EQIP) Conservation Reserve Program (CRP) Wetland Reserve Program (WRP) Small Watershed Program, PL-566 Conservation Easement Soil and Water Conservation Loan Program
Education	GTE Foundation Toyota TAPESTRY Grants National Environmental Education and Training Foundation (NEETF)
Water Quality Planning	Section 205(j) Water Quality Planning Grants
Stream Restoration	NC Division of Water Resources Stream Repair Funding
Forestry	Forestry Stewardship Incentive Program Forestry Incentives Program
Land Conservation	National Wetland Priority Conservation Plan NC Conservation Tax Credit Program Federal Wild and Scenic Rivers Program Emergency Wetlands Resources Act of 1986

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