



April 22, 2003

Thank you for your interest in North Carolina's water quality issues. Enclosed is the basinwide water quality plan that you recently requested from the Division of Water Quality (DWQ).

The basinwide planning program aims to identify and restore full use to impaired waters, identify and protect highly valued resource waters, and protect the quality and intended uses of North Carolina's surface waters while allowing for sound economic planning and reasonable growth. North Carolina relies on the input and experience of its public to ensure that the water quality plans are effective. DWQ coordinates plan development; however, plan implementation and effectiveness entails the coordinated efforts and endorsement of many agencies, groups, local governments, and the general public. Your participation is essential for us to achieve our goals.

Our website (<http://h2o.enr.state.nc.us/wqs/>) provides detailed information on our program, other basin plans, current events, publications, and rules and regulations. Please visit us at this site.

DWQ appreciates your interest in water quality issues, and we hope to continue working with you into the future. Please contact me if you have any further questions or ideas on specific basins at (919) 733-5083, ext. 354.

Sincerely,

A handwritten signature in cursive script that reads "Darlene Kucken".

Darlene Kucken
Basinwide Planning Program Coordinator

Enclosure

FRENCH BROAD RIVER BASINWIDE WATER QUALITY MANAGEMENT PLAN

**(Includes the French Broad, Pigeon, and
Nolichucky River Watersheds)**

July, 1995

Prepared by:

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This plan was approved and endorsed by the NC Environmental Management Commission on May 11, 1995 to be used as a guide by the NC Division of Environmental Management in carrying out its Water Quality Program duties and responsibilities in the French Broad River Basin.

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EXECUTIVE SUMMARY

NORTH CAROLINA'S BASINWIDE APPROACH TO WATER QUALITY MANAGEMENT - PURPOSE OF FRENCH BROAD RIVER BASIN PLAN

Basinwide management is a watershed-based water quality management initiative being implemented by the North Carolina Division of Environmental Management (DEM). The *French Broad River Basinwide Water Quality Management Plan* (French Broad Plan) is the fifth in a series of basinwide water quality management plans that will be prepared by DEM for all seventeen of the state's major river basins over the next five years. The plan will be used as a guide by DEM in carrying out its water quality program duties and responsibilities in the French Broad River Basin.

A basinwide management plan report is prepared for each basin in order to communicate to policy makers, the regulated community and the general public the state's rationale, approaches and long-term water quality management strategies for each basin. The draft plans are circulated for public review and comment and are presented at public meetings in each basin. The plan for a given basin is completed and approved prior to the scheduled date for basinwide permit renewals in that basin. The plans are then to be evaluated, based on follow-up water quality monitoring, and updated at five year intervals.

The French Broad Plan is due for completion in May of 1995 and will be updated in the year 2000. Basinwide NPDES permitting is scheduled to occur in August, September and November of 1995 and October, November and December of 1996.

BASINWIDE GOALS

The primary goals of DEM's basinwide program are to 1) identify and restore full use to impaired waters, 2) identify and protect highly valued resource waters, and 3) manage problem pollutants throughout the basin so as to protect water quality standards while allowing for sound economic planning by businesses and local governments. In addition, DEM is applying this approach to each of the major river basins in the state as a means of better identifying water quality problems; developing appropriate management strategies; maintaining and protecting water quality and aquatic habitat; assuring equitable distribution of waste assimilative capacity for dischargers; and improving public awareness and involvement in management of the state's surface waters.

PUBLIC WORKSHOP

A public workshop was held on June 2, 1994 in Fletcher, NC to familiarize stakeholders in the basin with DEM's basinwide approach and to solicit their comments on this basinwide plan. The workshop, which had 108 participants, was sponsored by the North Carolina Cooperative Extension Service (CES), DEM and the North Carolina League of Municipalities. Discussion groups identified priority issues and recommended actions:

Priority Issues Identified by Two or More Groups

- Agricultural pollution sources
- Point sources of pollution
- Development and land use planning
- Drinking water protection
- Education and public involvement
- Sedimentation
- Recreation impacts on water

Recommended Actions Identified by Two or More Discussion Groups

- Increase public education and involvement
- Increase technical and financial assistance for nonpoint sources, including agriculture
- Develop land use plans considering environmental and economic impacts
- Increase DEM resources for monitoring and enforcement
- Improve communications and coordination among parties involved in water quality
- Emphasize practical, simplified regulations to meet water quality goals
- Support new technologies for preventing and remediating pollution

DEM is striving to address these issues through its basinwide approach and has considered these and other issues identified by workshop participants in developing this basin plan. A more complete summary of the workshop is provided in Appendix V.

FRENCH BROAD BASIN OVERVIEW

The French Broad River Basin is the ninth largest river basin in the state covering 2,842 square miles. It is located entirely within the Southern Appalachian Mountains region of western North Carolina (Figure 2.1), west of the Eastern Continental Divide. All waters from the French Broad basin drain to the Gulf of Mexico via the Tennessee, Ohio and Mississippi Rivers. The basin includes the highest point in the United States east of the Mississippi River located atop Mount Mitchell (elevation 6,684 feet above mean sea level (MSL)). The lowest elevation in the basin is 1254 feet MSL where the French Broad River flows into Tennessee.

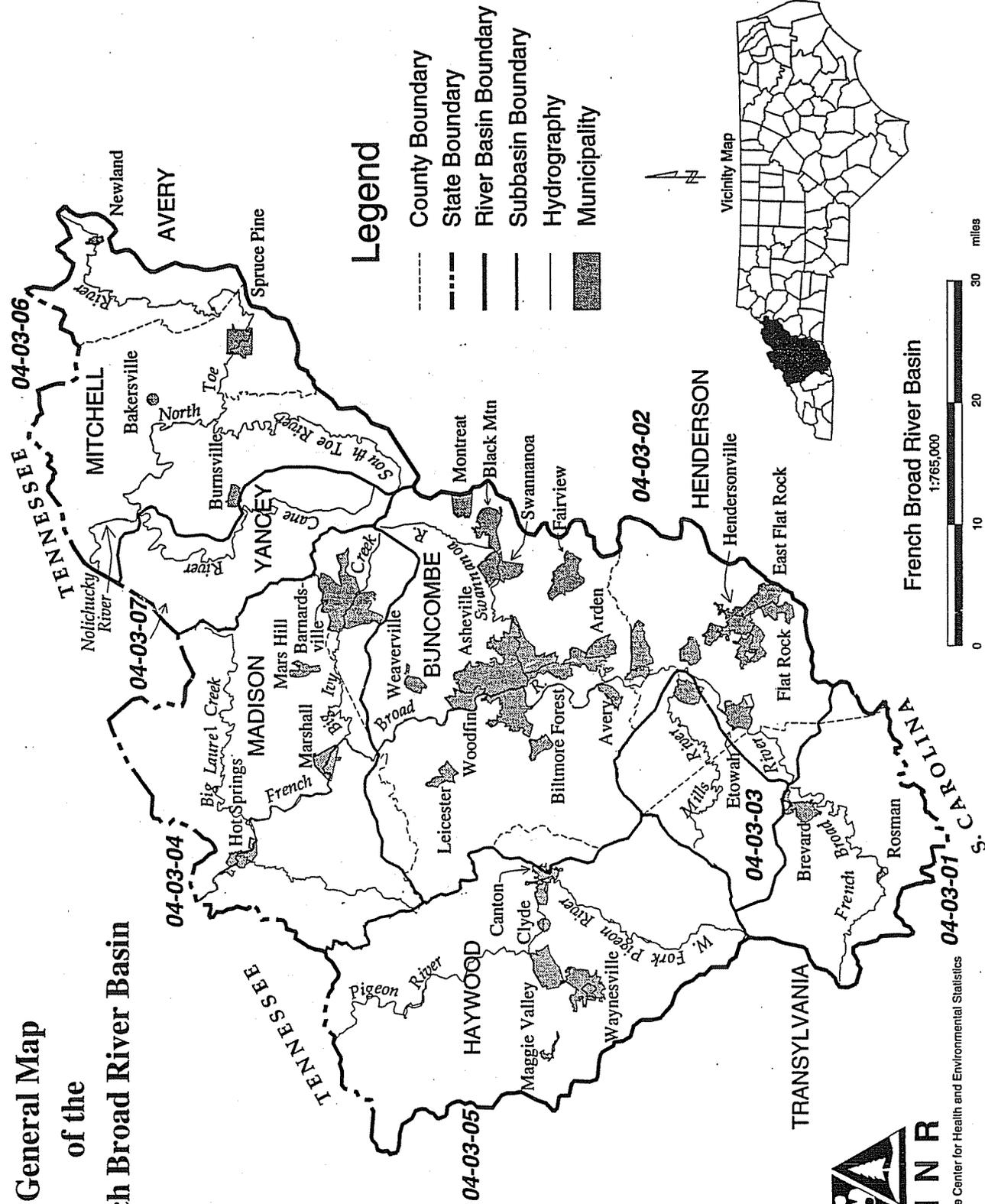
The French Broad Basin in North Carolina is composed of three separate drainages which flow northwest into Tennessee and do not join until they reach of the headwaters of Douglas Reservoir (a large multi-use impoundment managed by the Tennessee Valley Authority) (Figure 2.2). They include the Pigeon River, French Broad River and the Nolichucky River watersheds (which includes the North and South Toe Rivers and Cane River). There are 4,113 miles of freshwater streams in the basin and seven lakes, all man-made, greater than eight acres in size.

There are 9 counties and 24 municipalities located in whole or in part in the basin (Figure 2.3). The population of the basin, based on 1990 census data, was estimated to be 358,000. Municipalities with a population of 5,000 or more in the basin include Asheville, Black Mountain, Brevard, Hendersonville and Waynesville. The overall population density of the basin is 93 persons per square mile versus a statewide average of 123 persons per square mile. The percent population growth over the past ten years (1980 to 1990) was 8.7 % versus a statewide percentage increase of 12.7%.

Over half of the land in the basin is forested with much of it located within the 1.2 million-acre Pisgah National Forest. Steep slopes limit the land area suitable for development and crop production. Slopes of less than 12% are desirable for development purposes, and, in the absence of public sewer lines, soil depth of three feet or more over bedrock is desirable in order to allow construction of onsite septic systems. It is estimated that just 18% of lands in North Carolina's mountains meet these requirements. Most agricultural and development activities are therefore concentrated in river valleys. Statistics provided by the US Department of Agriculture, Soil Conservation Service indicate that cultivated cropland is shrinking as developed lands are increasing. Major industries in the basin include silviculture, agriculture (dairy, livestock, apples, Christmas trees), mining (feldspar, quartz, mica, gem stones and others) and tourism.

Water quality is generally high throughout the basin. Trout waters are abundant and many waters have been reclassified as High Quality or Outstanding Resource Waters.

General Map of the French Broad River Basin



Produced by: State Center for Health and Environmental Statistics
June, 1994

Figure 1 General Map of the French Broad River Basin

In the French Broad River Basin, there are 353 permitted NPDES dischargers, 176 of which are general permits or stormwater discharge permits. Of the total 353 dischargers, 14 are major facilities, 202 are domestic, 15 are municipalities and 84 are industries. The total permitted flow for all facilities is 120 million gallons per day (MGD).

ASSESSMENT OF WATER QUALITY IN THE FRENCH BROAD RIVER BASIN

An assessment of water quality data collected by DEM and others reveals that the French Broad River Basin has generally high water quality. Below is a summary of some key monitoring data that reflects the overall quality in the basin.

Summary of Biological Indicators

Benthic Macroinvertebrates - One type of biological monitoring used to indicate water quality and identify long-term trends is *benthic macroinvertebrate* sampling. These are primarily bottom-dwelling aquatic insect larvae of species such as stoneflies, mayflies and caddisflies. A total of 276 benthic macroinvertebrate collections at 152 sites in the French Broad River basin were sampled and analyzed from 1983 through 1992. The results clearly indicate the high water quality found in the French Broad River basin. All of the Poor sites listed below under 1992 were on Mud Creek, Clear Creek or Hominy Creek in subbasin 02 of the French Broad River Watershed.

Water Quality in the French Broad Basin as Indicated by Benthic Macroinvertebrate Sampling

	1983-1992		1992	
	No. of sites	% of total	No. of sites	% of total
Excellent	91	33	14	29
Good	55	20	12	24
Good-Fair	56	20	14	29
Fair	41	15	5	10
Poor	30	11	4	8
TOTALS	276	100	49	100

Benthos collections can also be used to determine changes in water quality for the 46 sites that have been sampled more than one time. Of these, over 70% showed no change in water quality. Ten sites indicated improvement in water quality, though some of these were minor changes. Four sites suggested a decline in bioclassification, but most of these sites were sampled in different seasons, with the summer samples showing the most impact. These may not be true declines, but rather denote that impacts can be more severe during low flow, high temperature periods.

Of the 49 basin assessment sites sampled in 1992, 21 have long-term benthos data. These are generally ambient sites on larger rivers and tributaries and probably give the most accurate presentation of changes in water quality in the basin. Of the 21 sites, 15 had no long-term change in bioclassification, 5 showed improvement, and only the French Broad River at Alexander showed a decline. This site is below the Metropolitan Sewerage District of Buncombe County WWTP and the Buncombe County Landfill and is subject to runoff from increasing development in the area.

The clearest improvement in water quality was found in the Cane River approximately eight miles below the Burnsville WWTP. It's bioclassification improved from Good-Fair in 1983 and 1985, to Good in 1987 and 1989, to Excellent in 1992. The increase in water quality seems to be related to improvements at the Burnsville WWTP made in 1985. Other improvements were found in the French Broad River near Asheville, the Swannanoa River near Biltmore, the Pigeon River below Champion Paper, and Richland Creek near Waynesville. The French Broad River site

improvement may be due to sewer system improvements and small dischargers connecting to the Metropolitan Sewerage District of Buncombe County WWTP. Improvements in upstream sewer systems and the closing of Sayles Biltmore Bleachery have probably contributed to the improved water quality for the Swannanoa River. Champion Paper has spent three hundred million dollars upgrading their manufacturing process, and while not complete in 1992 when biological sampling was performed by DEM, a positive effect on the benthos of the Pigeon River was found. Richland Creek improvements can be related to Dayco Corporation's decreased runoff from that facility into Richland Creek plus improvements to the Town of Waynesville's sewer system and the closure of the A.C. Lawrence Tannery.

Fish Community Evaluations - Fish community structure evaluations were performed at 43 locations in the French Broad River Basin from 1980 to 1993. Nineteen of these evaluations were conducted by the DEM. Collections from other sources, including the Wildlife Resources Commission, the University of North Carolina at Charlotte, and those of Rhode, accounted for the remaining information. The following table briefly summarizes the number of locations receiving various ratings for ecological health as determined by fish community structure analysis. Some streams within several of the individual subbasin summaries are particularly worth noting. The North Toe River, South Toe River, Cane River, Spring Creek, Big Ivy Creek, Shelton Laurel Creek, Reems Creek, and portions of the Swannanoa River each received ratings in either the Excellent category or the Good-Excellent category. The Poor and Very Poor sites were evaluated below the discharge of the Champion Paper Company on the Pigeon River. However, recent fish tissue sampling has shown decreased levels of dioxin in fish in the Pigeon River, and improvements in fish community structure are anticipated as a result of recent plant improvements.

Number of Fish Community Locations and rating categories

Excellent	4
Good-Excellent	12
Good	18
Fair-Good,	3
Fair	1
Poor-Fair	3
Poor	1
Very Poor	1

Use-Support Ratings

Another important method for assessing surface water quality is to determine whether the quality is sufficient to support the uses for which the waterbody has been classified by the state. The word *uses* refers to activities such as swimming, fishing and water supply. DEM has collected extensive chemical and biological water quality monitoring data throughout the basin, some of which is summarized above. All data for a particular stream segment have been assessed to determine the overall *use support* rating; that is, whether the waters are *fully supporting*, *partially supporting* or *not supporting* their uses. A fourth rating, *support-threatened*, applies where all uses are currently being supported but that water quality conditions are marginal. Streams referred to as *impaired* are those rated as either partially supporting or not supporting their uses. Use support ratings in the French Broad basin, described more fully in Chapter 4, are summarized below for freshwater streams and lakes.

Freshwater Streams and Rivers - Of the 4117 miles of freshwater streams and rivers in the French Broad basin, use support ratings were determined for 86% or 3522 miles with the following breakdown:

Use-support Rating Summary for the French Broad Basin (including Pigeon and Nolichucky)

Fully Supporting	51%
Fully Supporting but threatened	24%
Partially Supporting	10%
Not Supporting	1%
Not Evaluated	14%

Subbasin 02, which includes Asheville, Hendersonville and the Swannanoa River, was the only subbasin which had a larger percentage of streams which were either partially supporting or not supporting.

Probable causes and sources of impairment were determined for about 78% of the impaired streams. Sediment was the most widespread cause of impairment, followed by fecal coliform bacteria, dioxin and turbidity. Information on sources of impaired streams revealed that 356 miles were impaired by nonpoint sources, and 123 stream miles were impaired by point sources. Agriculture was the most widespread nonpoint source, followed by urban runoff, and construction. Subbasins 02 and 04 had the highest number of streams thought to be impaired by agriculture and subbasins 01 and 02 had the highest number attributed to urban runoff.

Lakes

Seven lakes in the French Broad Basin, totaling 1,373 acres, were monitored and assigned use support ratings (Table 4.7). Of these 7, six are fully supporting their uses and one is partially supporting its uses. Those supporting their uses include Lake Julian, Burnett Reservoir, Beetree Reservoir, Busbee Reservoir, Allen Creek Reservoir and Lake Junaluska. Lake Junaluska has been impacted by sediment and nutrients but it is still considered supporting its uses.

Waterville Lake (Walters) is rated as partially supporting its designated uses due to a fish consumption advisory issued by the State Health Director and problems with nutrient overenrichment. Elevated levels of dioxin were found in the lake fish tissues based on sampling conducted by DEM and the US Environmental Protection Agency in 1988. Champion International and several other wastewater treatment plants discharge upstream of Waterville Lake. Champion implemented a dioxin minimization plan in the mid to late 1980s. Recent fish tissue monitoring has found lower concentrations of dioxin in most fish species in the lake except for two bottom-feeders, carp and catfish. The no consumption advisory now applies only to carp and catfish. Monitoring for dioxin in fish tissue will continue at Waterville Lake annually.

MAJOR WATER QUALITY ISSUES AND RECOMMENDATIONS

Several water quality issues emerge as being of particular importance in light of factors such as the degree of water quality degradation, the value of the resources being impacted and the number of users potentially affected. Those issues considered most significant on a basinwide scale are presented below along with recommended corrective or research actions. These include: A. Sedimentation, B. Nutrients, C. Toxic Substances, D. Oxygen-consuming wastes, E. Protection of high value resource waters, F. Urban Stormwater, G. Alternative Water Supply Sources for Asheville and H. Fecal Coliform Bacteria.

A. SEDIMENTATION

Sediment is the most widespread cause of water quality use support impairment in the French Broad River Basin as it is throughout most of the state. Significant sources include agricultural activities, road construction, urban development, timber harvesting and mining. There are 19 programs administered by various local, state and federal agencies which have

been developed to control sediment from these activities (Table 6.3 of Chapter 6). Without these programs, sediment-related water quality impacts would undoubtedly be much worse. However, despite the combined efforts of all of the above programs there were still 266 miles of streams in the French Broad Basin found to be impaired by sediment, thus pointing to the need for continued overall improvements in erosion and sediment control. Most of the 19 programs referenced above and listed in Chapter 6 are the responsibility of agencies other than DEM. DEM is using the basinwide approach to draw attention to this issue to work more closely with the responsible agencies to find ways of continuing to improve erosion and sediment control.

Recommendations for Improving Erosion and Sediment Control

- Promote more effective implementation and maintenance of erosion and sediment control measures by contractors, farmers and other land owners.
- Evaluate effectiveness of enforcement of existing sediment control programs. Implement improvements that can be made with existing resources and/or identify additional resource needs.
- Encourage more widespread adoption of erosion and sediment control programs by local governments in rapidly developing areas.
- Promote public education at the state and local level on the impacts of sedimentation and the need for improved sediment control.
- Evaluate existing sedimentation and erosion control rules and statutes for possible strengthening. Consideration should be given to strengthening erosion control requirements. Examples include limiting the area of disturbed land on a given site and reducing the time period for reestablishing vegetation on denuded areas than currently required.
- Evaluate loopholes in interagency efforts to enforce sediment control measures, particularly as they relate to forestry and agricultural activities.

B. NUTRIENTS

The term *nutrients* in the context of this report refers to two major plant nutrients: nitrogen and phosphorus. Common sources of nutrients include fertilizers from agriculture and urban runoff, animal wastes and wastewater treatment plant effluent. High levels of these nutrients in the water can result in excessive algal growth and nuisance conditions in lakes. Two lakes and an unnamed pond in the basin have been identified as being adversely affected by nutrients, primarily by phosphorus.

Recommendations

Lake Junaluska - Lake Junaluska is affected primarily by nonpoint source runoff. A progressive program to implement nonpoint source controls is needed to reduce nutrient loading.

Waterville (Walters) Lake - Waterville Lake receives nutrients from both point and nonpoint sources. Nonpoint sources include runoff from animal operations, cropland and urban areas. Champion International is the major point source discharger upstream from the lake although others may also be contributing nutrients to the lake. It is recommended that a nutrient budget be developed over the next five years and that it be used to develop a lake nutrient management plan.

C. TOXIC SUBSTANCES

Point Source Toxicity Control Strategies

Toxic substances routinely regulated by DEM include metals, organics, chlorine and ammonia. Point source dischargers will be allocated chemical specific toxic substance limits and monitoring requirements based on a mass balance technique. Whole effluent

toxicity limits are also assigned to all major dischargers and any discharger of complex wastewater. Thirty-three dischargers in the basin are required to conduct toxicity testing. Where clusters of discharges and other pollution sources exist, concerns about the interaction of toxicants from different facilities are addressed by calculating a total maximum daily load (TMDL) for these streams. This method involves determining the total dilution available downstream of a number of pollution sources that are believed to contribute to a threat to water quality, and allocating pollutant loads to sources so as to prevent instream violations of water quality standards. Point source-related toxicity impairment problems are being, or have successfully been, addressed on the following water bodies:

Name	Subbasin
Little River	02
Bat Fork Creek	02
Mud Creek	02
Hominy Creek	04
Pigeon River	05
Walters Lake	05

All new and expanding dischargers are required to dechlorinate their effluent if chlorine is used for disinfection.

Nonpoint Source Toxicity Control Strategies

Strategies being implemented through the industrial and urban NPDES stormwater program should also be helpful in reducing toxic substance loading to surface waters. Industries are being required to prevent contamination of stormwater runoff from their sites through practices such as covering stockpiles of toxic materials that could pose a threat to water quality, and where necessary, implementing other best management practices to control the water quality of runoff. Water quality in Richland Creek has been improved as a result of efforts by DEM and Dayco Industries to control industrial stormwater runoff. Pesticides from orchards in the Clear Creek watershed in the upper French Broad have been implicated in the poor biological quality of that creek. Pesticides need to be applied, stored and disposed of properly.

D. MANAGEMENT OF OXYGEN-CONSUMING WASTES FROM DISCHARGE FACILITIES

General Recommended Strategies for Expanding and Proposed Discharges in the French Broad Basin

HOW and ORW Waters throughout basin: Discharges to these waters will receive limits in accordance with the Division's Antidegradation Policy (15A NCAC 2B .0201).

All new and expanding facilities not located on HOW, ORW or zero flow streams: Permit limits for oxygen-demanding wastes (BOD) to be based on empirical models. Emphasis to be placed on addressing interacting discharges and protecting downstream HOW and ORW waters.

Recommended Strategies for Specific Stream Segments

Gash Creek and Mud Creek - Past studies have identified limited assimilative capacity and dissolved oxygen problems in these tributaries to the upper French Broad River. More stringent waste limits for discharges have been required. Many discharges have been eliminated both through rescinding of permits (Gash Creek) and connecting smaller discharges to the Hendersonville WWTP (Mud Creek).

Pigeon River - A level C model of the river resulted in stringent waste limits for Champion International's plant in Canton. The limits were intended to both reduce the impacts on Pigeon River and Walters (Waterville) Lake.

Future Modeling Plans for Assessing Oxygen-demanding Waste Assimilative Capacity in Selected Streams

French Broad River Watershed (other than HQW, ORW, and zero flow streams)

A QUAL2E model will be developed for the French Broad River from Brevard to Asheville. Upon its completion it is to be applied to mainstem discharges from new and expanding facilities. It may be used for reallocation of existing wasteload allocations in the next basin plan. This study will also include evaluation of minimum flow releases from Cascade Lake on Little River, assimilative capacity in Gash Creek and effects of discharges on dissolved oxygen in Hominy Creek and the French Broad River.

Pigeon River Watershed (other than HQW, ORW, and zero flow streams)

For the Pigeon River, a QUAL2E model will be applied to the mainstem from Canton to Walters Lake once long-term improvements to the paper mill effluent are observed.

Recommended Evaluation of Trout Farm General Permit

Water quality sampling below some trout farms has shown moderate to severe impacts. Trout farms are required to meet waste limits established by a general permit. A special study of trout farms is recommended to determine the adequacy of the trout farm general permit.

E. PROTECTION OF HIGH RESOURCE VALUE WATERS

Waters considered to be biologically sensitive or of high resource value may be afforded protection through reclassification to HQW (high quality waters), ORW (outstanding resource waters) or WS (water supply), or they may be protected through more stringent NPDES permit conditions. Waters eligible for reclassification to HQW or ORW may include those designated as native trout waters, critical habitat for threatened or endangered species (as designated by the NC Wildlife Resources Commission), waters having Excellent water quality, or waters used for domestic water supply purposes and classified WS I or II. Portions of the following streams and their tributaries have been identified as potential candidates for reclassification to HQW or ORW. Each name is followed by its respective subbasin in parentheses. These streams will be evaluated for reclassification during the next basin schedule.

Potential HQW or ORW Streams

- French Broad River from source to SR 1129 (01)
- Laurel Branch (upstream sampling needed) and Sandymush Creek (02)
- Mills River and North Fork Mills River (03)
- Ivy Creek, Big Laurel Creek and Hickory Creek (04)
- Cold Springs Creek and Upper Jonathan Creek (05)
- Big Rock Creek (06)
- Cane River (07)

F. RUNOFF FROM URBAN STORMWATER AND DEVELOPMENT

Water quality impairment from growth and development is a major concern in the French Broad Basin. DEM has identified 76 miles of streams in the French Broad River Basin as being impaired by urban stormwater. DEM administers a number of programs aimed at controlling urban stormwater runoff. These include: 1) programs for the control of development activities near High Quality Waters (HQW) and Outstanding Resource Waters (ORW) and activities within designated Water Supply (WS) watersheds and 2) NPDES stormwater permit requirements for industrial activities and municipalities greater than 100,000 in population.

HQW, ORW and WS Stormwater Management

The HQW, ORW and WS waters carry with them specific management strategies to protect their uses, including measures to control stormwater runoff from urban development. The HQW and ORW requirements are implemented by DEM through its Regional Offices. Any development activities subject to the HQW or ORW requirements must submit plans and receive stormwater approvals from these regional offices. The water supply protection requirements are implemented by all local governments that have jurisdiction in a water supply watershed. Development activities covered by water supply protection requirements must be reviewed and approved by the appropriate local government.

Industrial NPDES Stormwater Management

Throughout the French Broad basin various types of industrial activities with point source discharges of stormwater are required to be permitted under the NPDES stormwater program. These include discharges related to manufacturing, processing, materials storage areas and construction activities with greater than five acres of disturbance. All of those areas requiring coverage must develop Stormwater Pollution Prevention Plans (SWPPP) to minimize and control pollutants discharged from their stormwater systems. These SWPPPs are subject to review and modification by the permitted facilities and DEM to assure that management measures are appropriate.

Recommendations for Controlling Stormwater Impacts by Local Governments Not Subject to NPDES Stormwater Requirements

While there are no municipalities in the basin large enough to be required to have an NPDES stormwater program, local governments in the basin are strongly encouraged to evaluate the impacts of stormwater runoff from their jurisdictions and to consider developing stormwater management programs. In this process a few program areas consistent with existing municipal NPDES programs are recommended as starting points for stormwater management. These include:

- Mapping of the local government's storm sewer system and outfall points, and development of procedures to update this information.
- Evaluating existing land uses in the local government's jurisdictional area to determine where sources of stormwater pollution may exist. In addition, local government activities and programs should be evaluated to determine where existing activities address stormwater management in some way, or could be modified to do so.
- Developing educational programs to alert people to the activities that may contribute pollutants to stormwater runoff and how they can change their practices to minimize or eliminate these problems.
- Developing programs to locate and remove illicit connections (illegal discharge of non-stormwater materials) to the storm sewer system. These often occur in the form of floor drains and similar connections. In practice, stormwater management programs represent an area where local governments can, and are strongly encouraged to, develop their own ideas and activities for controlling sources of pollution.
- Reviewing local ordinances pertaining to parking, curb and gutter and open space requirements. Many of these local ordinances could be modified to enhance water quality protection from urban stormwater impacts.

G. USE OF THE FRENCH BROAD RIVER FOR WATER SUPPLY PURPOSES BY ASHEVILLE AND BUNCOMBE COUNTY

A section of the French Broad River upstream from the City of Asheville has been classified for use as a water supply by the North Carolina Environmental Management Commission. This area is classified as WS-IV. Assessment of water quality data collected by the NC Division of Environmental Management had found the quality of the water to be

suitable for water supply purposes; however, the quality of the water for water supply use has been the subject of debate within the community. Those that question the quality of the water have expressed concerns over the presence of toxic substances and pathogens from both point and nonpoint sources of pollution.

After failure of a bond referendum to construct a water supply intake and treatment plant on the French Broad River just upstream of Asheville, the Asheville-Buncombe Water Authority (Authority) decided to seek alternative water supply sources. Consequently, the Authority, along with Henderson County, has requested that the Environmental Management Commission reclassify sections of two watersheds further upstream for drinking water supply purposes. Two water supply intakes are proposed, one on the French Broad River upstream of the confluence of the Mills River and the second in the Mills River downstream of the City of Hendersonville's water supply intake. The Authority and County have requested that the French Broad River section be reclassified as WS-IV and the Mills River be reclassified as WS-II.

The Division of Environmental Management Asheville Regional Office staff is conducting water quality sampling in order to assess the suitability of these two water bodies as drinking water supply sources. If these sources are suitable as raw water supplies then the Environmental Management Commission can proceed to rule-making to solicit comment on the proposed water supply reclassifications.

H. FECAL COLIFORM BACTERIA

Fecal coliforms are bacteria typically associated with the intestinal tract of warm-blooded animals and are widely used as an indicator of the potential presence of pathogenic, or disease-causing, bacteria and viruses. They enter surface waters from improperly treated discharges of domestic wastewater and from nonpoint source runoff. Common nonpoint sources of fecal coliforms include leaking or failing septic systems, leaking sewer lines or pump station overflows, runoff from livestock operations and wildlife.

Use-support data compiled by DEM indicate that there are 74 miles of streams impaired by fecal coliform bacteria, although the actual number of miles is probably significantly higher. One of the reasons is that fecal coliform measurements are taken only at the 29 ambient monitoring sites in the basin, so there are potentially many hundreds of miles of stream miles (especially smaller tributaries) that are not monitored for fecal coliforms that may be impacted. Fecal coliform levels were found to exceed the 200/100 ml state standard at least 20% of the time over the past five years at 12 of the 29 ambient monitoring stations in the basin.

Several recommendations for addressing fecal coliform contamination are presented below.

- Proper maintenance by homeowners of onsite waste disposal systems (such as septic tanks)
- Proper maintenance and repair of sanitary sewer lines by WWTP authorities.
- Elimination of direct unpermitted discharges of domestic sewage wastes (also known as "straight pipes") from homes.
- Proper management of livestock to keep wastes from reaching surface waters.
- Encouragement of local health departments to routinely monitor waters known to be used for body contact recreation (e.g., swimming and tubing). DEM has classified 177 miles of streams for primary water contact.

