APPENDIX IV

STATUS OF THE IMPLEMENTATION OF THE WATER QUALITY RECOMMENDATIONS CONTAINED IN THE COMPREHENSIVE CONSERVATION AND MANAGEMENT PLAN

IMPLEMENTATION of the CCMP:
Summary of the CCMP's Water Quality Plan for the Chowan River Basinwide Management Plan

WATER QUALITY PLAN

GOAL: Restore, maintain or enhance water quality in the Albemarle-Pamlico region so that it is fit for fish, wildlife and recreation.

OBJECTIVE A: IMPLEMENT A COMPREHENSIVE BASINWIDE APPROACH TO WATER QUALITY MANAGEMENT.

Effective management of water resources ultimately relies on the consideraton of system-wide processes and the cumulative impacts of activities across a river basin. The Division of Water Quality is approaching water quality research, management, and discharge permitting from a basinwide scale. This approach allows for a better balancing of point and nonpoint source contributions and control strategies.

Management Action 1: Develop and begin implementing basinwide plans to protect and restore water quality in each basin according to the schedule established by the Division of Environmental Management's Water Quality Section. The plans would include provisions for basinwide wetland protection and restoration.

The Division of Water Quality (DWQ) continues to develop basinwide management plans for all seventeen major river basins in the state according to schedule. DWQ coordinates with appropriate state and federal agencies to develop comprehensive basinwide plans that provide mechanisms to characterize water quality and biological resources within basins, target problematic watersheds, and manage water resources to support long-term growth. DWQ is currently incorporating wetland protection initiatives and targeting sites for wetland restoration, whenever wetland inventories are available, into the basinwide water quality management plans. This initiative began with the Roanoke River Basin Plan and has been incorporated in the Chowan River Basin Plan. This effort will become more comprehensive as additional wetland resource information is developed.

Management Action 2: Establish total maximum daily loads (TMDLs) and associated control strategies for all impaired streams in the Albemarle-Pamlico region by 1999.

DWQ uses TMDLs (total maximum daily loads) as a strategy for establishing water quality based controls on point and nonpoint sources of a given pollutant identified as contributing to a waterbody's impairment. TMDLs for exact locations are completed each time the DWQ performs a Waste Load Allocation for a NPDES permit. There are approximately 2000 of these completed for state waters at this time. The basinwide water quality management plans developed by the Division of Water Quality, contains information on specific and general TMDLs located in each respective river basin.

General TMDLs for specific water quality parameters have been completed for many locations. An example is the total nitrogen control target established for the Chowan River Basin.

<u>Management Action 3</u>: Renew all discharge permits in a river basin simultaneously by 1999.

DWQ's scheduled basinwide plans allow for synchronous renewal of discharge permits within respective river basins of the state. Under this approach, a basinwide NPDES permitting cycle was established in 1990. This is part of the basinwide management process currently underway in the Chowan River Basin. In January 1998, all NPDES permits will be issued to dischargers within this river basin. All NPDES permit renewals in the Albemarle-Pamlico region will be handled in this manner by 1999.

<u>Management Action 4</u>: Consider the potential for long-term growth and its impacts when determining how a basin's assimilative capacity will be used.

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 can be 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.

Wasteload allocations (WLAs) are performed by DWQ using models of varying scope and complexity, depending on the type of waste of interest and the characteristics of the receiving waters. DWQ uses models to determine the fate and transport of pollutants, reduction goals for point and nonpoint sources of environmental contaminants, and to derive effluent limits for NPDES permits. For new dischargers or for expanding dischargers, DWQ utilizes models to determine the existing assimilative capacity for that waterbody.

<u>Management Action 5</u>: Improve the scientific models for understanding the estuarine system, the effects of human activities on the system and the viability of alternative management strategies.

DWQ is working to enhance scientific modeling capabilities in the Neuse River Basin. The goal of the current Neuse River Basin modeling efforts is to provide tools to assist with efforts to determine appropriate and effective nitrogen control measures that will protect water quality in the Neuse River Estuary. To achieve this goal, three major modeling efforts are underway. Land Use Models will be used with point source discharge data to estimate total nitrogen loading to the river basin. A Fate and Transport Model will then be used to estimate how much of the total nitrogen load will arrive at the Estuary. And finally, a Nutrient Response Model will be used to predict how changes in nitrogen loading will impact water quality. Perhaps the information resulting from this

modeling effort can be applied in the Chowan River Basin to enhance our understanding of that system.

<u>Management Action 6</u>: Continue long-term, comprehensive monitoring of water quality in the APES system, collecting data to assess general system health and target regional problems.

DWQ's water quality monitoring programs continue to monitor water quality through a network of fixed stations within the Chowan River Basin. DWQ's monitoring program integrates biological, chemical, and physical data assessment to provide information for basinwide planning. DWQ has also benefitted from data collected by the US Geological Survey under that agency's NAWQUA water quality sampling program.

The Albemarle-Pamlico Citizen Water Quality Monitoring Program, a volunteer effort established in 1987, has also contributed to water quality monitoring efforts in the Chowan Basin. Currently, there are eight sites (predominately located near Arrowhead Beach) being monitored by citizens in this basin.

OBJECTIVE B: REDUCE SEDIMENTS, NUTRIENTS AND TOXICANTS FROM NONPOINT SOURCES.

Nonpoint sources of pollution are varied and are usually difficult to regulate. Targeted reductions can be accomplished by building on present programs and efforts. To accomplish true reductions, the CCMP recommends a three-pronged approach consisting of research and demonstration projects, incentive-based programs, and regulatory action and enforcement.

<u>Management Action 1</u>: For each river basin, develop and implement a plan to control nonpoint source pollution as part of the basinwide management plans.

A river basin nonpoint source team has been established for the Chowan River Basin. The nonpoint source team will work toward creating Action Plans to address nonpoint source concerns for the Chowan River Basin. The Action Plans will be an integral part of the basinwide planning process being implemented by DWQ.

<u>Management Action 2</u>: Expand funding to implement nonpoint source pollution controls, particularly agricultural best management practices through the N.C. Agriculture Cost Share Program, and also to develop a broader Water Quality Cost Share Program. Expand the cost share programs to include wetlands restoration. Increase cost share funds to problem areas.

The 1996 NC General Assembly increased the amount of money available to farmers under the NC Agriculture Cost Share Program by $1,750,000 for the Neuse River Basin and an additional $5,750,000 for the remaining river basins of the state. The Division of Soil & Water Conservation (DSWC) and Soil & Water Conservation Districts will target funding and technical assistance to priority areas identified through the basinwide

nonpoint source control plans. DSWC has hired additional personnel to provide technical assistance to farmers in implementing BMPs to control runoff.

Though it is not considered a cost share program, the General Assembly has recently approved the establishment of a Wetlands Restoration Program within the state. With initial funding of over $9 million, this program is intended to help restore the functions and values to degraded wetland areas located across the state.

Management Action 3: Continue to research and develop alternative septic systems and new best management practices to reduce nonpoint source pollution.

Failing septic tanks have been identified as a source of fecal coliform bacteria in some surface waters of the Chowan River Basin. The Division of Environmental Health (DEH) has established a research/education facility in Chatham County to determine the effectiveness of alternative septic systems and to train personnel regarding the installation, maintenance, and repair of the various types of systems. DEH plans to establish similar sites near Asheville (mountains) and Plymouth (coastal plain) that would facilitate efforts by the On-site Wastewater Section to develop and demonstrate alternative septic systems under a variety of site and soil conditions.

BMPs for urban, agricultural, and forestry settings have been evaluated for their cost-effectiveness in controlling nutrients. Much emphasis is placed on nutrient management planning and controlled drainage as important BMPs used to control nutrients. Several projects have recently received funding to improve knowledge of effectiveness of various traditional and innovative BMPs in improving water quality.

Management Action 4: Strengthen current enforcement to detect and correct ground and surface water quality violations from nonpoint sources.

The NC General Assembly (summer 1995) approved eight new positions (three for Use Restoration Waters; five for animal operations) to enhance inspection and enforcement of DWQ's surface water and ground water protection efforts.

Management Action 5: Strengthen implementation of forestry best management practices through training, education, technical assistance and enforcement.

The Division of Forest Resources (DFR) received limited, temporary funding to hire three BMP foresters statewide. This funding occurred in FY 1994-95 and 1995-96. These temporary positions were used to provide on-the-ground training, classroom education, technical assistance, and enforcement efforts. The need to hire permanent water quality (BMP) foresters exists statewide as well as in the five DFR districts which encompass the Albemarle-Pamlico region .

The DFR examined 3318 tracts statewide for FPG/BMP compliance in FY 1995-96. Of the 192 initially in a non-compliance status, nine had to be referred to either the Division of Land Resources or Division of Water Quality for enforcement action.

In a joint statewide educational effort, the DFR, the NC Forestry Association, the Cooperative Extension Service and forest industry have worked to provide forest management and water quality protection training to more than 1550 loggers and timber buyers through the ProLogger Program.

Management Action 6: Enhance stormwater runoff control by strengthening existing regulations and developing new ones, if needed, by 1995. Improve enforcement to ensure that stormwater management systems are properly installed and regularly maintained.

The Chowan River Basin is predominately a rural watershed. Presently, urban development in the basin is relatively limited. There are no municipalities in the Chowan River Basin required to obtain permits to manage stormwater runoff within their jurisdiction. Also within this basin, various types of industrial activities with point source discharges of stormwater are required to be permitted under the NPDES stormwater program.

Management Action 7: Implement an inter-agency state policy that addresses marina siting and integrates best management practices through permitting and better public education.

The current permitting process allows for inter-agency coordination for the review of new marina permits. However, there has been no formal organization of an inter-agency marinas policy committee to address the cumulative impacts of marina sittings in the coastal zone as referred to in this management action.

The Division of Coastal Management (DCM) has geo-located all marina and dockage facilities throughout the coastal area. GIS information include size, number of wet and dry slips, services, and support facilities. In addition to this information being made available to local governments for land use planning purposes, staff are using it to assess cumulative and secondary impacts of proposed new marinas and additions. DCM has also worked to develop a coordinated SEPA review and public trust lease review for all marinas with the Division of Water Quality, the Division of Marine Fisheries, the Wildlife Resources Commission and other state agencies.

To strengthen marina BMPs, DCM (via a grant from The Clean Vessel Act) provided funding to marina operators to install pump-out stations at their facilities. In 1995, 24 marinas were equipped with pump-out stations -- 12 of these marinas were located in the Albemarle-Pamlico region. This initiative continued through 1996.

OBJECTIVE C: REDUCE POLLUTION FROM POINT SOURCES, SUCH AS WASTEWATER TREATMENT FACILITIES AND INDUSTRY.

In addition to the reduction of point source impacts gained through the utilization of basinwide management planning, the CCMP indicates that further gains can be made through

the use of proactive management strategies such as pollution prevention and increased emphasis on facility inspections and monitoring.

<u>Management Action 1</u>: Promote pollution prevention planning and alternatives to discharge, where feasible, for all point sources to reduce the volume and toxicity of discharges.

All of the state's major municipal dischargers, and most of the minor municipal dischargers, utilize pretreatment programs. There is increased coordination between the Office of Waste Reduction's Pollution Prevention Program and DWQ's Pretreatment Program to help reduce/improve inputs and operating costs from point source dischargers.

However, there is a need to improve pretreatment of the industrial wastes received by the wastewater treatment plants and to encourage pollution prevention at the various industrial facilities located in the Chowan River basin.

Municipal or industrial wastewater facilities are required to either land apply their waste (for municipal plants) or meet discharge limits for nitrogen and phosphorus. During the last fifteen years, several facilities in the Chowan River basin have removed their discharge to surface waters and began applying their waste to the land. These conversions have been instrumental in reducing the nutrient load to the nutrient-enriched Chowan River system.

<u>Management Action 2</u>: Expand and strengthen enforcement of National Pollutant Discharge Elimination System (NPDES) permits. Increase site inspections and review of self-monitoring data to improve facility compliance by 1995.

A future initiative (as identified in this plan) for the Chowan River basin is to improve compliance with permitted dischargers. However, in order to be more proactive in preventing permit violations and resulting water quality degradation, DWQ's Compliance Group requires more staff for review of monitoring data and for conducting inspections. Increased inspections provide the benefit of improved communication between DWQ and dischargers and early detection of potential problems which prevents some violations before they occur. Due to budget limitations, DWQ's Compliance Group has not been able to increase staff to enhance this effort.

OBJECTIVE D: REDUCE THE RISK OF TOXIC CONTAMINATION TO AQUATIC LIFE AND HUMAN HEALTH.

The CCMP indicates that several sites within the Chowan River basin were identified as exceeding levels of concern for toxic contaminants in ambient water, sediment, and/or fish tissue. State and federal agencies should coordinate monitoring efforts for these environmental media to provide the maximum geographic and most cost-effective monitoring coverage. It is important to further evaluate the potential impact to aquatic life, wildlife, and human health, and to identify additional contaminated sites.

<u>Management Action 1</u>: Increase efforts to assess and monitor the extent of estuarine sediment contamination, fish and shellfish tissue contamination, water quality violations, and to identify the causes and sources of these problems.

Utilizing data from its monitoring program, DWQ is working to better identify the causes and sources of contaminants in the Chowan River basin. DWQ's Intensive Survey Group continues to monitor for water quality at those sites identified as being most contaminated. DWQ's Biological Assessment Group continues to monitor and analyze for chemical contaminants in fish tissues. Much of the analyses of fish tissues focuses on metals and dioxins. The Group conducts basin assessments of fish tissue contamination according to the schedule established by the Basinwide Management Program. When necessary, special studies are conducted in areas of concern. Over the years, special studies have been conducted in the Chowan River -- most have been related to the problems with nutrient enrichment.

DWQ and other environmental agencies are discussing ways to improve monitoring coverage through better coordination of field resources. Enhanced inter-agency coordination and cooperation would help create a more effective and comprehensive monitoring initiative in the Chowan River basin.

<u>Management Action 2</u>: Continue to issue fish advisories as necessary to protect public health. Improve communication and education about the risks associated with eating contaminated fish and shellfish.

As stated above, DWQ's Biological Assessment Group continues to monitor and analyze for chemical contaminants in fish tissues and special studies are conducted in the basin as necessary. When analysis of fish tissues result in levels exceeding FDA or EPA screening levels, the Biological Assessment Group notifies the Division of Epidemiology's Occupational and Environmental Epidemiology Section (OEES). The OEES reviews the fish tissue analysis and issues a fish consumption advisory as necessary. Currently, fish consumption advisories for dioxin are in effect for the Chowan River from the Virginia line to Albemarle Sound.

<u>Management Action 3</u>: Remediate toxic contamination where necessary and feasible.

Currently, no remedial action has occurred involving the removal of contaminated sediment. Known contaminated sediment sites are being monitored.

OBJECTIVE E: EVALUATE INDICATORS OF ENVIRONMENTAL STRESS IN THE ESTUARY AND DEVELOP NEW TECHNIQUES TO BETTER ASSESS WATER QUALITY DEGRADATION.

Several highly visible indications of environmental stress in the Albemarle-Pamlcio esturay include chronic algal blooms, fish and shellfish kills, and fish and shellfish disease. To provide the widest geographic and most cost-effective monitoring coverage and to better track

these environmental stress indicators, the CCMP calls for improved coordination of monitoring efforts by state and federal agencies and citizen groups. Resources should be concentrated to establish a response network to identify and collect data on algal blooms, fish and shellfish kills, and fish and shellfish disease outbreaks; improve management tools to address shellfish contamination; and accelerate the development and application of new bio-assessment techniques to evaluate cumulative environmental impacts to estuarine waters.

Management Action 1: Continue to track and evaluate indicators of environmental stress, including algal blooms, fish kills, and fish and shellfish diseases.

There has been no formal organization of an environmental stress indicators response network as referred to by this management action. However, the Division of Water Quality, Division of Water Resources, and the Wildlife Resources Commission's Division of Boating and Inland Fisheries, within their existing field personnel structure, are in the process of creating a standardized fish kill information form that would incorporate all data by those agencies who are investigating fish kill episodes. This information will help to establish a single and more comprehensive data base on fish kills. A fish kill database comprised of data from these agencies will provide a more complete and accurate picture of the cause and extent of the kills. This should, in turn, lead to development of measures to help prevent future kills.

Management Action 2: Improve the techniques for evaluating the overall environmental health of estuarine waters.

DWQ's Biological Assessment Group recently developed an Estuarine Biotic Index to help improve techniques used to evaluate indicators of water quality degradation in estuarine waters. A final report was submitted to EPA in July 1995.

Based on habitat heterogeneity studies, conducted for preparation of the Estuarine Biotic Index, DWQ has learned that the best habitat for monitoring changes in water quality is sea grasses. Man-made structures, rocks, wood, crab pots and nets all scored as well as sea grasses for being inhabited by water quality sensitive taxa. Oyster bars appear to be the least useful place to sample. Despite the large number of taxa that can be collected near oyster bars, most are very pollution tolerant so differentiation of changes in water quality are difficult. DWQ has recently received additional funding from EPA to continue this effort.

Management Action 3: Develop and adopt better indicators of shellfish contamination as soon as possible.

Due to a lack of federal funding, efforts by NOAA's National Indicator Study to develop better indicators of shellfish contamination have been put on hold. Even if this program should receive future funding, it would take several more years of scientific research to develop the necessary indicators.