

Tar-Pamlico NSW Implementation Strategy: Phase II

December 8, 1994

I. Background and Purpose

On September 12, 1989, the Environmental Management Commission (EMC) classified the Tar-Pamlico River Basin as Nutrient Sensitive Waters (NSW). Figure 1 is a map of the basin.

On February 13, 1992, the EMC approved a revised NSW Implementation Strategy that established the framework for a nutrient reduction trading program between point and nonpoint sources of pollution. The Strategy also established certain conditions to be met by an association of dischargers in the basin known as the Tar-Pamlico Basin Association (the Association).

The February 13, 1992 NSW Strategy for the Tar-Pamlico River Basin represents the first phase or "Phase I" of an attempt to establish and achieve a nutrient reduction goal to address eutrophic conditions in the estuary. Phase I covers the period 1990-1994 and is included as Appendix A. Parties to the Phase I agreement as approved by the EMC included the Division of Environmental Management (DEM), the Tar Pamlico Basin Association, the N.C. Environmental Defense Fund (EDF) and the Pamlico-Tar River Foundation (PTRF).

The Association agreed to meet specific conditions in order to avoid effluent limits for nutrients in their permits and to have the opportunity to reduce nutrient loading in the most cost-effective manner, including the option to fund agricultural best management practices (BMPs). These conditions included the development of an estuarine hydrodynamic computer model, engineering evaluations of wastewater treatment plants, annual monitoring reports on nutrient loading, and minimum payments for the administration and implementation of agricultural BMPs. The Association met all conditions established in Phase I. Table 1 summarizes the status of Phase I commitments.

The purpose of this document is to formalize and clarify the details of the second phase of the Tar-Pamlico NSW Strategy covering 1995-2004. This Phase II document has been signed by the Division of Environmental Management, the Tar Pamlico Basin Association and the N.C. Division of Soil and Water Conservation (DSWC) and approved by the EMC. This agreement is also a component of the Tar-Pamlico River Basinwide Water Quality Management Plan adopted by the EMC on December 8, 1994. Future negotiations of the Tar-Pamlico NSW Strategy will be conducted as part of the basinwide planning process.

II. Association members

Members of the Tar-Pamlico Basin Association include the following facilities: Belhaven, Bunn, Enfield, Franklin Water and Sewer Authority, Greenville, Louisburg, Oxford, Pine Tops, Rocky Mount, Spring Hope, Warrenton, Washington, Tarboro and National Spinning. There will be no new members added to the Association within five years after adoption of this agreement with the exception that corporations (that serve as integrators) and animal producers may apply for and be granted membership. At the end of five years, Association membership may be reopened to include non-Association facilities, but the annual target load will be adjusted accordingly.

III. Nutrient Reduction Targets

The Association contracted with HydroQual, Inc. to perform the estuary modeling. HydroQual developed a two dimensional, laterally averaged hydrodynamic water quality model to predict the impacts of nutrient loading in the estuary. The model extends from Greenville to Pamlico Point a distance of approximately 60 miles. Figure 2 illustrates the model segmentation below Washington. The year 1991 was chosen as the calibration year for the model because it represented when typical impairment of the estuary was evident. It was also the baseline year established in the revised Phase I agreement for tracking nutrient reductions by requiring nutrient monitoring at the facilities.

A. Nutrient Assimilative Capacity Exceeded in the Tar-Pamlico Estuary

DEM applied the model under the 1991 calibration conditions as well as under various nutrient reduction scenarios and plotted the results for a site located near Washington in order to evaluate possible management strategies. The Washington site was chosen since modeling results indicated that this was where the greatest number of chlorophyll a and dissolved oxygen (DO) violations occurred, and the magnitude of the violations was the greatest. Thus, it is the critical portion of the river. Under the 1991 loading conditions, the model indicates that the chlorophyll a standard was violated approximately 18 percent of the time at Washington. These predictions are daily averages and are averaged across the river in each segment. Therefore, specific areas within a model segment or given times of day may indicate better or worse water quality than predicted.

The nutrient inputs during the model applications were reduced by varying amounts to determine what loading was necessary to protect water quality standards. The model was applied to simulate a five year period to allow improvements

in the sediment concentrations to be reflected in the water column quality. The results indicate that a 30 percent reduction in total nitrogen (TN) was predicted to significantly reduce the frequency and severity of algal blooms in the estuary. To prevent exceedance of the chlorophyll-a standard of 40 ug/l, the model predicted that a 45 percent reduction in total nitrogen may be needed (Figure 3). Nitrogen reduction is also predicted by the model to significantly increase dissolved oxygen in bottom water, to prevent extended anoxic conditions and to decrease the frequency of supersaturation conditions (Figure 3a).

B. Recommended Nutrient Reduction Goals for Nitrogen and Phosphorus

It is difficult to project exactly what would be an acceptable level of water quality in the basin. Even if the basin was not developed, it is likely that blooms could occasionally occur naturally. In addition, a 45 percent reduction in nitrogen loading may not be feasible given current BMP methods and point source treatment technologies. There is also some model error and uncertainty in predictions which could result in costly treatments which are not needed to meet water quality standards.

The model was calibrated under relatively high nutrient loading conditions. Therefore, the modeling results must be evaluated within the context of the model calibration. The further a given nutrient loading scenario applied to the model is from calibration conditions, the greater the uncertainty is for obtaining an accurate prediction of the water quality impacts of such loading. At present, the interpretation of modeling results suggests that algal and DO concentrations in the estuary will respond significantly to reductions in nitrogen loading and that a 45 percent TN reduction is needed to have no chlorophyll-a violations. However, the model can not be considered fully reliable for conditions so different from existing conditions. To improve confidence in the modeling results, the model must be recalibrated to reflect changing conditions as nutrient loading is reduced. Given the uncertainty inherent to a predictive model, an interim target will be established while model calibration will continue.

The interim goal for TN reduction is 30 percent from 1991 conditions. This level of reduction was selected because it resulted in most of the predicted change in chlorophyll-a and DO that was observed under TN reduction scenarios applied to the model. However, it is likely that further TN reduction will be required, but a more exact target can be established once the model is calibrated to

lower nutrient loading conditions. The goal of 30 percent reduction is an interim goal that is more realistic and achievable over the life of

the Agreement. The final target of no water quality standard violations remains an ultimate goal of the Tar Pamlico Basinwide Plan.

The model supports that nitrogen is the most appropriate target nutrient to limit the potential for problematic algal blooms in the middle estuary. The model does not suggest significant improvements in chlorophyll-a levels in the middle estuary based on additional reductions in phosphorus. It is important, however, to consider the upper and lower bounds of the study area, where phosphorus is more likely to be limiting on a seasonal basis. Phosphorus levels may become more important in the future after significant nitrogen reductions cause a commensurate shift in ratios of nitrogen to phosphorus. However, the proposed targets, if achieved, would result in TN:TP ratios within a desired range. Another potential problem associated with elevated concentrations in either or both nutrients in this estuary is the loss of important submerged aquatic vegetation (SAV). While it is extremely difficult to model and predict recovery of SAV and their effect on nutrient dynamics, it would not be prudent to support additional increases in a phosphorus rich estuary. Therefore, this strategy recommends no additional increase in load of total phosphorus into the estuary. Total Maximum Daily Load (TMDL) targets are set for 1,260,000 kg/yr of TN and 180,000 kg/yr of TP at Greenville.

1. Annual Loading Target for Total Nitrogen for the Association

The Total Nitrogen (TN) loading from all sources at Greenville in 1991 was calculated to be 1.8 million kilograms (kg). Based on the 30 percent reduction goal developed with the estuary model, the TN loading target at Greenville is calculated to be 1.26 million kg/yr. However, there are Association discharges located below Greenville which need to be incorporated into these figures. In order to do this, loading estimates were developed at Washington based on yields using the average flow to drainage area ratio. This calculation indicates the TN target at Washington to be 1.944 million kg/yr. A 30 percent reduction goal provides a TN target load at Washington of 1.361 million kg/yr or a TN load reduction goal of 583,000 kg/yr for both point and nonpoint sources.

The point source allocation of the total reduction needed is established as 8 percent. The Association's loading accounts for approximately 90 percent of all point source loading. Therefore, Association members should have to reduce their load by approximately 41,976 kg from the 1991

load at Washington (i.e., 583,000 x 0.08 X 0.9). In order to account for in-stream losses to Washington, a nutrient decay rate of 30 percent is assumed. Therefore, the Association's load reduction target needed from 1991 loads at the end of the pipe is 59,966 kg (i.e., 41,976 divided by 0.7).

The TN loading for the Association's discharges (including National Spinning and Tarboro but not including Belhaven) in 1991 is calculated to be 465,222 kg. Therefore, the annual Association target loadings for TN is 405,256 kg at the end of the pipe (i.e., 465,222-59,966 = 405,256). This cap for TN loading by Association members has been established based on water quality parameters and not on treatment technology.

The above calculations are summarized as follows:

TN Load in 1991 at Greenville (kg)	1,800,000
TN Target at Greenville based on estuary Model (kg/yr) (30%reduction):	
1,260,000	

Since there are Association dischargers below Greenville, loading numbers were estimated at Washington based on yields (average flow to drainage area ratio). The following numbers were calculated:

Estimated TN Load delivered through the Tar River at Washington in 1991(kg)	1,944,000
Target Load at Washington based on 30% reduction (kg/yr)	- 1,361,000
Total Load Reduction Needed from 1991(kg)	= 583,000
Association Load for 1991 (kg)	396,916
Tarboro 1991 Load (kg)	+ 37,129
National Spinning 1991 Load (kg)	+ 31,177
Total Association Load for 1991 (kg)	= 465,222
Point Source Allocation for Total Reduction Needed	8%
Association Contribution to Point Source Loading	90%
Association Load Reduction Needed from 1991 at Washington (583,000 X 0.08 X 0.9)	41,976
Association Load Reduction Needed from 1991 at end of pipe (assume 30% decay rate) (41,976 divided by 0.7)	59,966
Annual Target Association TN Load (kg)	= 405,256

at end of pipe (465,222-59,966)

This annual target load actually becomes a cap that is not to be exceeded in future years unless new monitoring and modeling results suggest all water quality standards and goals are being met. Any loading above the target load in any year of the Agreement would have to be offset by the purchase of nutrient reduction through funding nonpoint source controls.

2. Annual Loading Target for Total Phosphorus for the Association

To ensure protection of water quality, total phosphorus loading should be held constant at Greenville. Therefore, 1991 loadings for the Association (including National Spinning and Tarboro) should be used as the target. This target is calculated as follows:

Association Load in 1991 (kg)	64,478
Tarboro 1991 Load (kg)	+ 3,498
National Spinning 1991 Load (kg)	+ 1,768
Annual Target TP Load for Association (kg)	=69,744

As with TN, this annual target load actually becomes a cap that is not to be exceeded in future years unless new monitoring and modeling results suggest all water quality standards and goals are being met. Any loading above the target load in any year of the Agreement would have to be offset by the purchase of nutrient reduction through funding nonpoint source controls.

3. Nonpoint Sources

The goal to be accomplished at Washington is to reduce total nitrogen loading by 30 percent from 1991 loadings. This reduction amounts to 583,000 kg/yr and is necessary to progress toward the attainment of water quality standards. Since the point source allocation is established at 8 percent of the total reduction needed, nonpoint source activities in the basin must work to attain a reduction of approximately 536,360 kg/yr at Washington (i.e., 583,000 X 92%) to achieve a 30 percent reduction from all sources. In order to account for in-stream losses to Washington, a nutrient decay rate of 30 percent is assumed. Therefore, the in-stream reduction target for nonpoint sources is 766,228 (i.e., 536,360 divided by 0.7).

The success of nonpoint source activities will require substantial coordination by multiple nonpoint source agencies, local governments, environmental groups and the

Department of Environment, Health and Natural Resources. The Division of Environmental Management will convene and coordinate meetings with the appropriate groups and agencies to establish a coordinated and focused plan to achieve the required nonpoint source nutrient reductions. This additional strategy that provides further details of how such reductions are to be achieved by nonpoint sources and the accounting of such actions will be established by September 1995.

E. Non-Association Facilities (A list of all dischargers and permitted flows is provided in Appendix B. NOTE: The requirement for non-Association facilities to fund nonpoint source controls is beyond the scope of this Agreement. For these requirements to apply, a formal NSW Strategy with these requirements must be adopted by the EMC through rule-making.)

1. Existing Domestic Dischargers -

Existing non-Association dischargers \geq 0.5 MGD will receive effluent permit limitations to remove TP to 1 mg/l and TN to 6 mg/l monthly average within five years of the date of this Agreement.

2. Expanding Domestic Dischargers -

Existing non-Association dischargers expanding to $>$ 0.5 MGD will receive effluent permit limitations to remove TP to 1 mg/l and TN to 6 mg/l monthly average at the time of expansion. Compliance with the limits is required when the wastewater treatment plant becomes operational. In addition, the increase in TN and TP loading resulting from the expansion shall be offset by funding nonpoint source control programs approved by DEM. Facilities with a permitted flow of $<$ 0.5 MGD at the time this agreement is signed shall offset TN and TP loading in excess of the loading that would be achieved at best available technology (BAT) (6 mg/l for TN and 1 mg/l for TP) at a flow of 0.5 MGD (i.e., $0.5 \text{ MGD} \times (6 \text{ mg/l TN} + 1 \text{ mg/l TP}) \times 1384$ (conversion factor) = 4,844 kg/yr). Facilities with a permitted flow of \geq 0.5 MGD at the time this agreement is signed shall offset TN and TP loading in excess of the loading that would be achieved at BAT at the pre-expansion permitted flow. The actual payment rate for the nonpoint source controls shall be 110 percent of the cost established in Section IV of this Agreement. Payment will be based on one year of loading at BAT for the permitted flow. Payment of one year of loading for the life of the permit assumes that BMPs implemented with those funds will be effective for the remaining years of the permit. Payment for the excess loading shall be transacted before the permit can be issued or renewed. The calculation to determine NPS

payments is as follows:

Example for a facility with a permitted flow of < 0.5 MGD at the time of signing the agreement:

NPS Payment (\$) = [[(Permitted flow including expansion) X (TN and TP limit concentrations) X 1384] - [0.5 MGD X (6 mg/l TN + 1 mg/l TP) X 1384]] X (BMP cost-effectiveness rate) X 1.1

Example for a facility with a permitted flow \geq 0.5 MGD at the time of signing the agreement:

NPS Payment (\$) = [[(Permitted flow including expansion > 0.5 MGD) X TN and TP limit concentrations X 1384] - [(Permitted flow at the time agreement was signed) X (6 mg/l TN + 1 mg/l TP) X 1384]] X (BMP cost-effective rate) X 1.1

3. Existing Industrial Dischargers

Existing industrial dischargers will be given effluent limits based on a case-by-case determination of BAT. These limits must be achieved within five years of the date of this Agreement.

4. Expanding Industrial Dischargers

Industrial dischargers expanding \geq 0.5 MGD will be given effluent limits based on a case-by-case determination of BAT. Compliance with the limits is required when the plant becomes operational. In addition, the increase in TN and TP loading resulting from the expansion shall be offset by funding nonpoint source control programs approved by DEM. Facilities with a permitted flow of < 0.5 MGD at the time this agreement is signed shall offset TN and TP loading in excess of the loading that would be achieved at best available technology (BAT) at a flow of 0.5 MGD (i.e., 0.5 MGD X (BAT concentrations) X 1384 (conversion factor) = base loading (kg/yr)). Facilities with a permitted flow of \geq 0.5 MGD at the time this agreement is signed shall offset TN and TP loading in excess of the loading that would be achieved at BAT at the pre-expansion permitted flow. The actual payment rate for the nonpoint source controls shall be 110 percent of the cost established in Section IV of this Agreement. Payment will be based on one year of loading at BAT for the new permitted flow and will be prorated over the life of the permit. Payment of one year of loading for the life of the permit assumes that BMPs implemented with those funds will be effective for the remaining years of the permit. Payment for the excess loading shall be transacted before the permit can be issued or renewed. The calculation to determine NPS payments is as follows:

Example for a facility with a permitted flow of < 0.5 MGD at the time of signing the agreement:

NPS Payment (\$) = [[(Permitted flow including expansion) X (TN and TP limit concentrations) X 1384] - [0.5 MGD X (BAT concentrations) X 1384]] X (BMP cost-effectiveness rate) X 1.1

Example for a facility with a permitted flow \geq 0.5 MGD at the time of signing the agreement:

NPS Payment (\$) = [(Permitted flow including expansion \geq 0.5 MGD) X TN and TP limit concentrations X 1384] - [(Permitted flow at the time agreement was signed) X (BAT concentrations) X 1384]] X (BMP cost-effective rate) X 1.1

F. **New Facilities**

1. **Effluent Limits-** New dischargers that can not use a nondischarge alternative will receive the following effluent permit limitations:

- New > 50,000 gpd: 1 mg/1 TP monthly average
- New \geq 500,000 gpd: 1 mg/1 TP monthly average; 6 mg/1 TN monthly average

All new dischargers are required to comply with the nutrient limits when the plant becomes operational.

2. **Nonpoint Source Controls-** All nutrient loading by a new discharger must be offset by making payments for nutrient reduction through nonpoint source control programs approved by DEM so that there is no net increase in load. That is, the maximum nutrient load allowed by the permit must be accounted for in nutrient reductions through nonpoint source controls. The actual payment rate for the nonpoint source controls shall be 110 percent of the cost established in Section IV of this Agreement. The total cost for NPS payments will be based on one year of loading at 6 mg/1 for TN and 1 mg/1 for TP for the permitted flow and will be prorated over the life of the permit. Payment of one year of loading for the life of the permit assumes that BMPs implemented with those funds will be effective in reducing nutrient loading during the remaining years of the permit. Payment for the life of the permit shall be transacted before the permit can be issued or renewed. Permit renewals will be transacted according to the policy set forth in this paragraph. The calculation to determine the NPS payment for new facilities is as follows:

NPS Payment (\$) = (Permitted flow) X (6 mg/l TN + 1 mg/l TP) X cost effectiveness rate) X 1384 X 1.1

IV. **Nutrient Reduction Trading Program**

The purpose of this agreement is to allow Association facilities to achieve DEM's nutrient reduction goal by funding other more cost-effective nutrient reduction measures than the cost of meeting effluent limits at the Association facilities. The alternative to meeting the point source reduction goals through nutrient reduction at the facilities is to fund enough nonpoint source controls so that, at the very least, the annual nutrient reduction goal for the Association is achieved.

A. **Trading Options-** The nonpoint source control options available to be funded by the dischargers in the nutrient reduction trading program include the following:

- support the implementation of agricultural BMPs such as those initiated in Phase I (including nutrient management plans),
- support of a DSWC staff position for administration and technical assistance initiated in Phase I,
- *support the development and implementation of nutrient management plans for non-agricultural nutrient sources, and
- *support wetland and riparian buffer restoration projects.

*At this time, there is no mechanism or infrastructure to transact these trading options, so these are just included to allow such future trading options once formal mechanisms are established.

B. **Trading Credits-**

1. **Flat Rate-** A flat rate will be useful for calculating up-front costs associated with new dischargers, but can be applied for all situations. A flat rate for trading purposes during the first two years of this agreement is established at \$29/kg of nitrogen reduced in loading to the estuary. This flat rate has been determined by DEM based on a draft report by the Research Triangle Institute entitled "The Cost-effectiveness of Agricultural BMPs for Nutrient Reduction in the Tar-Pamlico Basin (November, 1994) and the inclusion of a safety factor. This flat rate shall be evaluated and adjusted, as necessary, every two years from the date of this agreement. The rate will be established by DEM in consultation with parties to this Agreement.

2. **Credit Life-** All credits for structural BMPs shall

have a useful life of ten years or such longer period as may be provided for in DSWC's BMP contracts. The credit life for non-structural BMPs shall be three years. Credit using the flat rate will be provided to the Association if a staff position is funded.

3. **Payment Schedule-** The annual payment for BMPs shall be made one month after the annual monitoring report is submitted on March 1.

4. **Phase I Credits-** In Phase I, the Association contributed \$850,000 for agricultural BMPs, but only \$500,000 was required as a condition of the Phase I Agreement. However, approximately \$400,000 has been obligated to date. Using the established rate in Phase I of \$56/kg for the obligated portion, the Association will have reduced TN by approximately 7,143 kg/yr. Credit for the remaining \$450,000 secured under Phase I shall be based on the flat rate of \$29/kg or 15,517 kg/yr. The total credit of 22,660 kg/yr will be applied to the Association beginning January 1995 and shall last ten years.

5. **Funding Sources-** If the dischargers can secure additional funding from sources such as federal grants, exclusive of funds available to the states, these funds can be used to make nutrient reduction payments or to fulfill other conditions to this agreement described below. Any additional funds that the dischargers secure for nonpoint source controls must be in addition to that which would have occurred from federal, state, and local sources if not for the existence of this agreement.

V. **Minimum Conditions to this Agreement**

In order to have access to the option for nutrient trading with nonpoint sources to meet mass limits as a group in lieu of nutrient limits at each discharger, the Association agrees to meet the following minimum conditions:

A. **Monitoring**

Association facilities shall continue to monitor effluent TP and TN and the Association shall submit an annual report to DEM every March 1 detailing this monitoring data from the previous year. The annual report will be used to determine compliance with this strategy. DEM may authorize less frequent monitoring (i.e., other than weekly) where the discharger demonstrates that less frequent sampling is adequate to characterize facility loadings.

The monitoring protocol to be used is as follows:

-Weekly samples must be taken, but they may be preserved for a monthly "one time" analysis of the four weekly samples. That is, the four weekly samples are to be analyzed separately and not as a mixed or "composite" sample.

-The samples must be stabilized with sulfuric acid at the time of sampling, as prescribed by "Standard Methods for Examination of Water and Wastewater."

-Weekly effluent samples must be held under refrigeration for not more than 28 days before analysis.

Where a facility fails to report flow data, its flow for the unreported period shall be estimated based on the ratio of the facility's reported flow in the remainder of the year to the combined flow of the other Association POTW members during the same time period. Where a facility fails to report TP or TN concentrations, the facility's nutrient concentrations for the unreported period shall be estimated by DEM using the best available data.

B. Modeling

1. Nutrient Fate and Transport Model

Current models available in the Tar-Pamlico Basin do not determine what percentage of nutrients which run off into a stream in the upper portion of the watershed actually is transported to the estuary. Fate and transport modeling is extremely data intensive and is not practical to perform on a large basin at this time. However, it is feasible to do this type of modeling on a small watershed if data are available.

If future monitoring indicates severe nutrient problems on a smaller watershed, it may be cost effective to perform studies to develop a fate and transport model. The Association has agreed to pursue federal funding to study fate and transport.

2. Hydrodynamic Model Support Service

With the hydrodynamic model of the estuary completed, the Association will provide funding for a support service with HydroQual, Inc. to answer questions DEM staff members have as they apply the model during Phase II of the project.

Specifically, the Association will review reports, participate in application of water quality model, and make recommendations where necessary on how to improve

effectiveness of application. The Association also will provide continued technical assistance to DEM by means of a hotline to HydroQual to answer DEM's questions on applying the water quality model.

3. Model Calibration

In order to support model recalibration in future years, DEM will establish a flow relationship between Tarboro and Grimesland with funds provided by the Association or other sources. If Association funds are used, it will not affect the credit received by the Association under subparagraph IV.B.4.

VI. Local Water Quality Impacts

This Agreement does not preclude DEM from requiring individual point sources to remove nutrients where a localized water quality problem exists. DEM shall provide copies of any proposed wasteload allocation or permit requiring nutrient control for an Association member so that the Association, NCEDF, and PTRF may provide timely comments on the proposed agency action.

VII. Decision-Making Authority

DEM shall have final decision-making authority with regard to the adequacy of nutrient tradeoffs and allocations. Similarly, the Soil and Water Conservation Commission shall have final decision-making authority with regard to agricultural BMP implementation. All other designated nonpoint source management agencies shall retain their responsibilities within the basin.

VIII. Nonpoint Source Controls

There are other nonpoint source control initiatives underway in the Tar Pamlico River Basin that go beyond the terms of this Agreement to reduce nutrient loading. These initiatives include the following combination of voluntary and regulatory programs:

A. Animal Operations- All animal operations in the basin are required to comply with the EMC regulations for animal waste management. All operations are prohibited from discharging animal waste to surface waters of the state. Larger feedlots are required to register the operation with DEM and to obtain and implement an approved animal waste management plan by December 31, 1997. Failure to register or follow an approved plan will lead to civil penalties. New or expanded operations must obtain an approved plan that

requires design, construction, operation and maintenance standards and specifications to be met before animals are stocked. Willful dischargers are subject to an immediate civil penalty not to exceed \$5,000. Water quality standard violations are subject to civil penalties up to \$10,000 per day.

B. Nutrient Management Plans- Farms that are not covered under the animal waste rules are encouraged to develop and apply nutrient management plans. Nutrient management planning also is encouraged for use on non-agricultural land. Beaufort County is participating in a Water Quality Incentive Project for nutrient management planning administered by the USDA. A Memorandum of Agreement will be established with the major agricultural corporations to control nutrients at contracting farms. Nutrient management planning will be required in the coastal zone of the basin under the coastal nonpoint source program by January 1999.

C. Agriculture Cost Share Program- The ACSP can target critical areas for financial and technical assistance to help reduce nutrient loading. Additional technical assistance for the ACSP was approved by the 1994 General Assembly.

D. Coastal Nonpoint Point Source Program- All land within the coastal zone boundary will be required to meet specific management measures for nutrient and sediment control established by EPA and NOAA by 1999. This program will be administered by DEM and DCM.

E. USDA Programs- The USDA administers programs that may be targeted for nutrient controls in the basin. These include Conservation Reserve, Conservation Compliance, Sodbuster, Swampbuster, Wetland Reserve, and the Water Quality Incentive Program.

F. Cooperative Extension Service- The North Carolina Cooperative Extension Service recently conducted training for their staff in nutrient management planning. Educational programs can be developed and implemented in the basin.

G. Use Restoration Waters (URW)- The proposed URW supplemental classification, if adopted by the EMC, may be applied to specific areas in the basin. The URW would require site-specific BMPs to correct documented water quality problems.

IX. Violation of Terms of this Agreement

If the terms of this agreement are violated, then the following strategy will be implemented following a presentation to

the EMC.

- A. All new dischargers shall evaluate non-discharge alternatives as their primary option and implement a non-discharge system unless they can demonstrate that non-discharge is technically or economically infeasible.
- B. All new dischargers > 0.05 MGD who cannot utilize a non-discharge alternative shall meet effluent limits of 1 mg/l on total phosphorus monthly average.
- C. All new dischargers with design flows > 0.5 MGD who cannot utilize a non-discharge alternative shall meet effluent limits on total nitrogen of 6 mg/l monthly average. They shall meet total phosphorus limits of 1 mg/l year round.
- D. All new dischargers affected by nutrient limits will be expected to comply with the limits when the wastewater treatment plant becomes operational.
- E. All existing discharges with design flows > 0.5 MGD shall meet effluent limits on total nitrogen of 6 mg/l monthly average. Total phosphorus shall be limited to 1 mg/l monthly average for these facilities. These facilities will be given three years from the date of EMC action following strategy failure to comply with these limits. A reopener clause will be placed in all renewed NPDES permits in the Basin to allow the inclusion of effluent nitrogen and phosphorus limits.
- F. *All new, expanded and existing dischargers shall offset any excess nutrient loading from the annual targets established by DEM for each facility by funding nonpoint source controls according to procedures described in paragraphs III E. and F. of this document (pages 13-15).

*NOTE: The requirement for non-Association facilities to fund nonpoint source controls is beyond the scope of this Agreement. For these requirements to apply, a formal NSW Strategy with these requirements must be adopted by the EMC through rule-making.

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APPENDIX A
PHASE I NSW AGREEMENT

APPENDIX B

Association and Non-Association Dischargers and Permitted Flows