Tar-Pamlico
Nutrient Sensitive Waters
Implementation Strategy: Phase IV

July 2015

I. Summary

This document establishes the fourth phase of a nutrient control Agreement for point source discharges in the Tar-Pamlico River Basin, reaffirms loading goals established in Phase II for all sources in the basin. The Agreement was initiated in 1990 in response to nutrient-driven water quality impairments in the Pamlico River estuary, and specifically to address a mandate from the NC Environmental Management Commission to the Division of Water Resources to develop a nutrient reduction strategy. At its inception, the Agreement provided a cost-effective alternative to uniform technology-based nutrient concentration limits. It later added elements of a nutrient TMDL for the basin, including estuary loading goals and point and nonpoint source allocations. Phase I spanned five years from January 1990 through December 1994, Phase II covered another ten years through December 2004, and Phase III spanned an additional ten years through December 2014.

This fourth phase continues the structure established in Phase II and continued throughout Stage III with a few key updates described in this document. This structure includes overall performance goals for the nutrient strategy of 30 percent reduction in nitrogen loading from a baseline year of 1991 and no increase in loading of phosphorus from that baseline. An association of point source dischargers, the Tar-Pamlico Basin Association (Association), receives collective annual end-of-pipe nitrogen and phosphorus loading caps. In the event that either cap is exceeded, the Association will fund agricultural practices at a predetermined cost-effectiveness rate to offset those exceedances through the NC Agriculture Cost Share Program.

Phase IV spans an additional ten years through May 31, 2025, with plans to update the Agreement within two years to address several improvements. The Phase IV incorporates modifications negotiated during Phase III including updates to the Association membership and related nutrient caps, inclusion of individual load limits in each member's NPDES permits, and proposed actions over the next two years that will improve the nitrogen offset rate and establish a phosphorus offset rate. Parties to the Agreement include the NC Environmental Management Commission (Commission), the Association, the Division of Water Resources (Division), and the NC Department of Agriculture & Consumer Services Division of Soil and Water Conservation (DSWC), which would administer offset payments.

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II. Background

A. Phase I

On September 12, 1989, the Commission classified the Tar-Pamlico River Basin as Nutrient Sensitive Waters (NSW). Figure 1 is a map of the basin. On February 13, 1992, the Commission 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 represented the first phase of an attempt to establish and achieve a nutrient reduction goal to address eutrophic conditions in the estuary. Phase I covered the period 1990-1994. Parties to the Phase I agreement as approved by the Commission included the Division (then the Division of Environmental Management), the Tar Pamlico Basin Association, Environmental Defense (then the Environmental Defense Fund) 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.

The Phase I Agreement set collective, technology-based discharge loading limits for the Association in the form of an annually decreasing, combined nitrogen and phosphorus cap. During the 1990 to 1991 period, low cost operational changes were implemented at several facilities to reduce nitrogen loadings. The engineering evaluation of member facilities and implementation of the study's recommended nutrient removal improvements also yielded significant loading reductions. These changes, combined with installation of nutrient removal at several of the larger facilities, allowed the Association to reduce its nutrient loads and stay beneath its caps throughout Phase I.

B. Phase II

The Phase II Agreement spanned ten years from January 1995 through December 2004. Modeling of the Pamlico River estuary during Phase I provided a foundation for water quality-based loading goals for Phase II. Based on the estuary modeling, Phase II established overall performance goals for the nutrient strategy of 30 percent reduction in nitrogen loading from a baseline year of 1991 and no increase in loading of phosphorus from that baseline. Based on these goals, it also established nitrogen and phosphorus discharge loading caps for the Association. These caps also accounted for the load reductions achieved through operational changes implemented during the 1990/1991

period. The Association stayed beneath both caps throughout Phase II, steadily reducing its loading of both nutrients despite steady increases in flow. Overall, from 1990 through 2003, the Association decreased nitrogen loads to the river by approximately 45% and phosphorus loads by over 60%, while flows increased approximately 30%. Appendix A is a table of caps and loads for all years of the Agreement through 2003. The success of this collective cap approach may be attributed in part to the element of time it provided for individual facilities to implement nutrient removal as it became most cost-effective for them.

Phase II also established requirements for non-Association point source dischargers and called for rule-making to fully enact those requirements. That rulemaking became effective in April 1997. It required new and expanding dischargers over certain sizes to meet effluent concentration limits and to fully offset new or increased loads using the same offset approach developed for the Association. During Phase II, there were no new dischargers to the basin, and no existing dischargers became subject to the rule's requirements.

Phase II also established instream nutrient goals for nonpoint sources and called for a separate nonpoint source (NPS) strategy. That NPS strategy was put into effect in January 1996 as a voluntary effort that would work from existing programs, seeking additional funds and developing accounting tools. After two years of voluntary implementation, the EMC found progress insufficient and initiated nonpoint source rulemaking. Rules were fashioned after those recently adopted in the adjacent Neuse basin. They addressed riparian buffer protection, agriculture, urban stormwater, and fertilizer management. The rules became effective during 2000 and 2001, and continue to be fully implemented as of 2006.

C. Phase III

Phase III of this Agreement was approved by the EMC on April 15, 2005. It spanned an additional ten years through December 31, 2014. This third phase continued the structure established in Phase II including the overall performance goals for the nutrient strategy of 30 percent reduction in nitrogen loading from the baseline year of 1991 and no increase in loading of phosphorus from the baseline. The Phase III Agreement updated Association membership and related nutrient caps. It proposed action in the first two years to update the offset rate, resolve related temporal issues, and revisit alternative offset options. During this time parties to the Agreement met several times and came to agreement on issues related to banked credit and credit life that are reflected in Phase IV of the Agreement. Parties to the Agreement agreed to incorporate individual allocations and nutrient limits in individual NPDES permits, that would become applicable if the group load reductions were not achieved, and proposed actions to take in Phase IV of the Agreement to update the nitrogen offset rate and establish a phosphorus offset rate.

D. Summary of Updates for Phase IV

Since its inception, the Tar-Pamlico Agreement has been praised by the U.S. EPA and the Commission for its innovative and integrative approach to nutrient management. For many years, the EPA held it up as a model for others to use. Of course, nutrient control efforts have continued to evolve on a national scale. Considerable advances have been made and

experience gained in treatment technologies and strategic approaches to nutrient controls, and the EPA has established a considerable body of guidance materials to facilitate these efforts. Where appropriate, this agreement is being updated to reflect that knowledge.

Throughout Phase I, II, and III of this Agreement, nutrient discharges by the Tar-Pamlico point sources have been limited solely by the group caps found in the Agreement. By design, the Tar-Pamlico permits have not included facility specific nutrient limits, and the EPA Region 4 office had accepted that approach.

Based on guidance released by EPA's Office of Wastewater Management in 2007[1], EPA Region IV notified the Division during Phase III that Section 301(b)(1)(C) of the federal Clean Water Act and federal NPDES regulations (40 C.F.R. 122.44(d)(1)) require that NPDES permits include any limitations established in or based upon an approved TMDL. To comply with EPA's directive, the Division added the group caps for nitrogen and phosphorus in the members' permits as part of the 2009 renewals and agreed to add individual limits in the 2014 renewals. The Division has worked closely with the Association and the other parties to the Agreement to distribute the group's nitrogen and phosphorus allocations among the members in a fair and equitable manner.[2] The Division has also worked with the parties to develop a new NPDES group permit that effectively allows the Association to continue operating under the existing 'group caps' approach. The new permit will include both the group caps and the members' individual limits; but, so long as the Association meets the group caps, the members will not be subject to their individual limits. The individual limits for one nutrient or the other will only become effective if the Association exceeds the group cap for that nutrient. Similarly, the individual limits in the members' permits will only become effective if they leave the Association (see Section X). The Division expects to implement the group and individual limits in the 2014 permit cycle and has updated this Agreement accordingly. Individual limits are summarized in Table 3. Section IV (F) provides an overview of the group permit and explains how it relates to the members' individual permits.

In addition to incorporating individual limits into the permits, parties to the Agreement convened several times over the years during Phase III to address other modifications to be incorporated in Phase IV. During these negotiations, parties resolved or established action items for the following items which are discussed in more detail in the applicable sections of this document:

1. Added the City of Creedmoor to the Association membership and noted Creedmoor's request for allocation pending their application and DWR approval for an NPDES permit.

[1] *Watershed-based National Pollutant Discharge Elimination System (NPDES)Permitting Technical Guidance*. U.S. Environmental Protection Agency, Office of Wastewater Management, Water Permits Division. EPA 833-B-07-004. August 2007. http://www.epa.gov/npdes/pubs/watershed_techguidance_entire.pdf

[2] Nutrient allocations are the maximum allowable contributions from a source or group of sources as established in the Tar-Pamlico TMDL. Allocations are an allowance and the basis for nutrient limits in the affected NPDES permits. Nutrient limits are the enforceable application of those allocations.

2. Resolved how banked credit accrued during Phases I, II, and III and how future banked credits will be handled under Phase IV of this Agreement.

3. Established a process for updating the N offset rate and establishing a P offset rate that will capture the actual costs of the nutrient reducing practices implemented.

4. Addressed various permit related issues including localized hotspots and appropriate enforcement actions for cap exceedances,

5. Made additional refinements including updates to the Annual loading tables, a new map, updated credit register, and table of load allocation / limits to be included in the group and individual permits.

III. Association Members

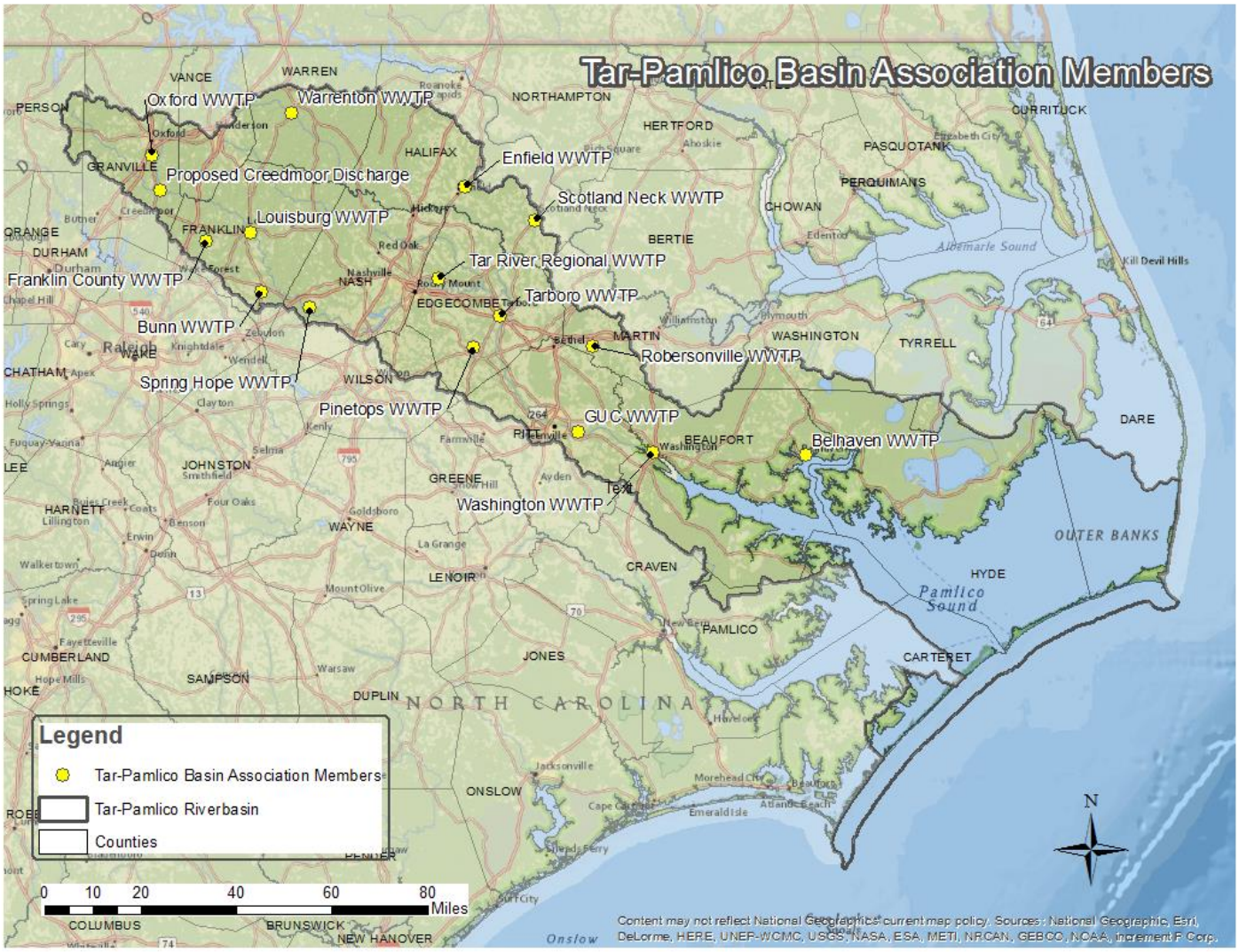
At the signing of this Agreement, the Tar-Pamlico Basin Association is comprised of the following members. Membership in Phase IV reflects one change from the final membership in Phase III with the addition of Creedmoor, which became a member of the Association in July 2012. Creedmoor was admitted to the Association upon a commitment to maintain specific nutrient concentration and mass limitations. However, as discussed with and agreed to by the parties to this Agreement, no additional load allocation will be added to the Association's Phase IV group caps until such time that the City of Creedmoor applies for and receives final DWR approval of on individual NPDES discharge permit.

Table 1. Current Membership of Tar-Pamlico Basin Association

1. Belhaven 2. Bunn 3. Enfield 4. Franklin Water & Sewer Authority 5. Greenville Utilities 6. Louisburg 7. Oxford	8. Pinetops 9. Robersonville 10. Rocky Mount 11. Scotland Neck 12. Spring Hope 13. Tarboro 14. Warrenton 15. Washington 16. Creedmoor

At a total permitted flow of 61.9 MGD, the Association now comprises 98.7% of permitted discharge flows in the Basin, as detailed in Appendix B.

Figure 1. Tar-Pamlico Basin Association Members



The Association may modify its membership at any time upon notification to the Division. At such time, the Division shall develop calculations to adjust the nitrogen and phosphorus caps using best available information on the nutrient loads produced by the facilities in question in 1991. The calculation method shall be the following:

(A) For additions that were discharging to the basin in 1991, add 70% of the facility's 1991 end-of-pipe nitrogen load and 100% of the facility's 1991 end-of-pipe phosphorus load.

(B) For removals of any of the 14 original members to the Phase II Agreement, deduct 87% of the facility's 1991 end-of-pipe nitrogen load and 100% of the facility's 1991 end-of-pipe phosphorus load (the Phase II nitrogen cap equates to 87% of the Association's 1991 end-of-pipe load; this calculation preserves that proportion).

(C) For removals of any additions to the membership since the initiation of Phase II that were discharging to the basin in 1991, deduct 70% of the facility's 1991 end-of-pipe nitrogen load and 100% of the facility's 1991 end-of-pipe phosphorus load.

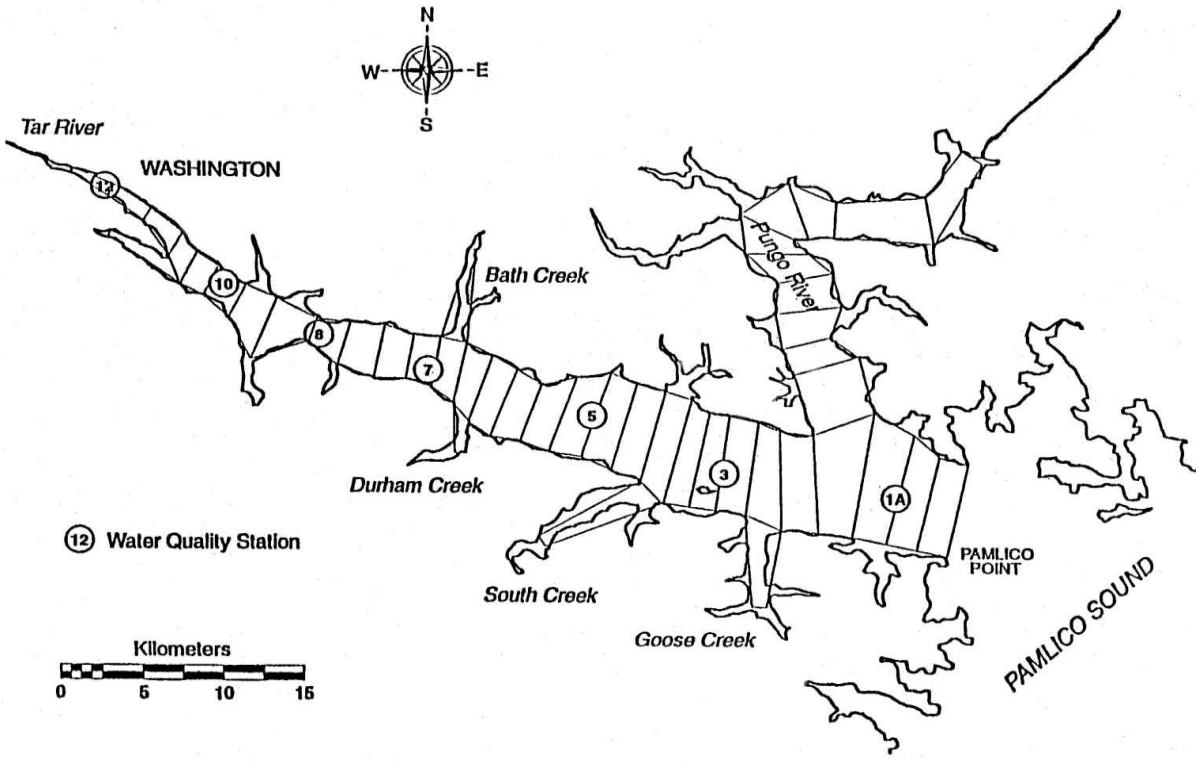
(D) For additions that are proposed new dischargers to the basin, the parties shall establish a method, as needed, in keeping with the loading goals of the Agreement.

The Division shall modify the Agreement to incorporate such changes. The Agreement shall be considered amended to address changes related to Subsections (A), (B), or (C) above upon signature of the President of the Association and the Director of the Division. Amendments related to Subsection (D) above shall require consent of all parties including the Commission. Adjusted caps shall apply beginning with the full calendar year nearest in time to the date of the facilities' addition to or removal from the Association. Should the parties agree to adjust the caps at some point based on additional modeling results, this calculation method shall be revisited accordingly and in accordance with the Clean Water Act.

IV. Nutrient Reduction Targets – History and Status

In 1992, 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.

Figure 2. HydroQual, Inc. Nutrient Model Segmentation below Washington, NC



A. Nutrient Assimilative Capacity Exceeded in the Pamlico Estuary

The Division 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 indicated 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.

Division staff reduced nutrient inputs by varying amounts during model applications to determine what loading reductions were needed to protect water quality standards. Model runs simulated a five-year period to allow improvements in the sediment concentrations to be reflected in water column quality. The results indicated 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 exceedances 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). The model also predicted that nitrogen load reduction would significantly increase dissolved

oxygen in bottom water, prevent extended anoxic conditions and decrease the frequency of supersaturation conditions (Figure 4).

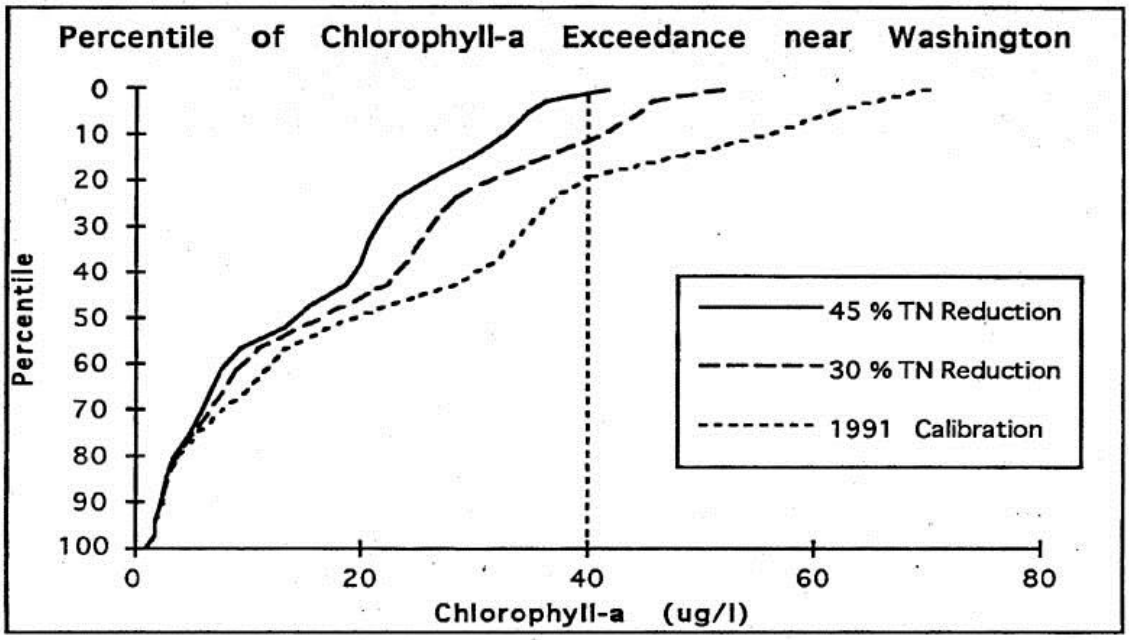
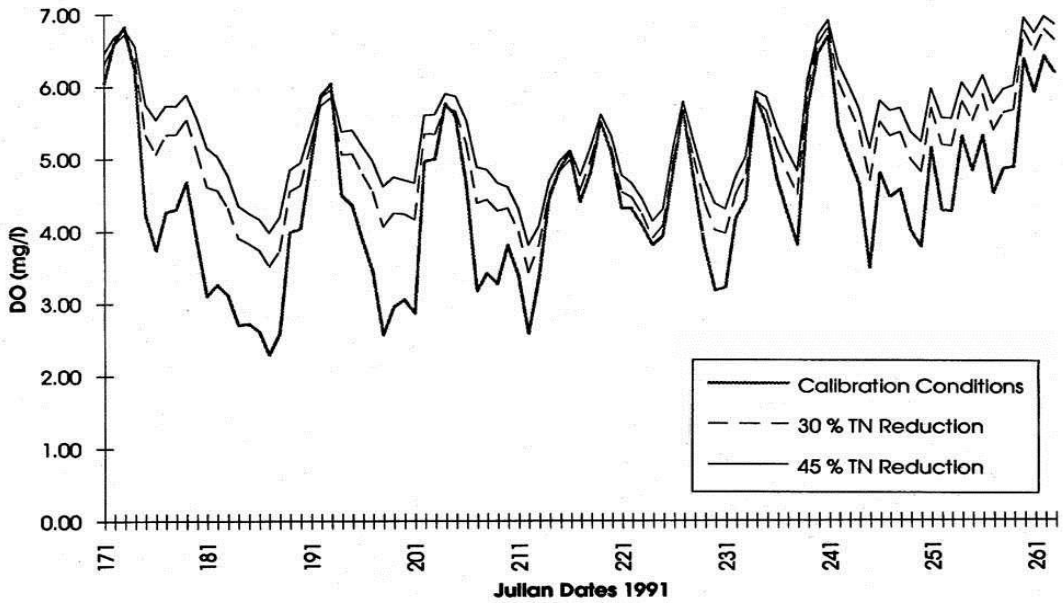


Figure 3. Predicted Percentiles of Chlorophyll-a Exceedances of the 40 ug/l Standard at Washington, NC, for Three Nitrogen Loading Scenarios Using HydroQual's Estuarine Model

Figure 4. Predicted Summer Bottom Layer Dissolved Oxygen at Station 3 for Three Nitrogen Loading Conditions



B. Estuary Nutrient Reduction Goals for Nitrogen and Phosphorus

The Phase II Agreement recognized the difficulty in projecting exactly what would be an acceptable level of water quality in the basin. Even if the basin were not developed, blooms would occur naturally at some frequency. In addition, a 45 percent reduction in nitrogen loading was considered potentially infeasible given the limitations of point and nonpoint source treatment technologies and BMP effectiveness. There was also some model error and uncertainty recognized in predictions, which could result in costly treatments that were not needed to meet water quality standards.

The model was calibrated under relatively high nutrient loading conditions in general. However, 1991 was a much dryer than average year; 1991 mean annual flow measured at the USGS Tarboro gauging station was 1,249 cfs, equating to 55% of the mean value for the entire period of record (1936 to present) and falling below the first quartile value. In wetter years, both nutrient loading and estuary response will differ from dry-year results. Therefore, the modeling results must be evaluated within the context of the model calibration.

Moreover, 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. The interpretation of modeling results made by Division staff at the outset of Phase II was that algal and DO concentrations in the estuary would respond significantly to reductions in nitrogen loading and that a 45 percent TN reduction was needed to eliminate chlorophyll-a violations. However, the model could not be considered fully reliable for conditions so different from those existing at that time. To improve confidence in the modeling results, it was recommended that the model be recalibrated to reflect changing conditions as nutrient loading was reduced. Given the uncertainty inherent to a predictive model, an interim target was established , and the Phase II Agreement recommended that the model be recalibrated to lower nutrient loading conditions after reductions had been achieved in the basin.

The goal for TN reduction set in Phase II as an interim goal and maintained in Phase IV is 30 percent from 1991 conditions (relatively dry year). This level of TN 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. The Phase II Agreement forecast the need for further reductions beyond 30 percent, which it proposed to quantify by recalibrating the estuary model in the future under lowered nutrient loading conditions. It identified an ultimate goal of no water quality standard violations.

The estuary model supported that nitrogen was the most appropriate target nutrient to limit the potential for problematic algal blooms in the middle estuary. The model did not suggest significant improvements in chlorophyll-a levels would be seen 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, Phase II recommended and this phase continues the goal of no increase in load of total phosphorus into the estuary from 1991 conditions.

Total Maximum Daily Load (TMDL) targets were set in Phase II for 2,777,821 lbs/yr of TN and 396,832 lbs/yr of TP at Greenville based on the relatively low flow year 1991. Recognizing that additional point and nonpoint source loadings occur below Greenville, the Phase II Agreement extrapolated loading estimates to Washington "based on yields using the average flow-to-drainage area ratio". This calculation estimated the 1991 TN load delivered to Washington as 4,285,781 lbs.. The associated 30% nitrogen reduction goal established in Phase II and continued here for all sources is 1,285,293 lbs/yr, making the loading goal for all sources at Washington 3,000,488 lbs/yr nitrogen and no increase in phosphorus loading relative to the 1991 baseline.

C. Annual Total Nitrogen and Total Phosphorus Loading Targets For Association Member Facilities

The Phase II Agreement established annual end-of-pipe nitrogen and phosphorus loading caps for the fourteen Association members. While the parties recognize that some assumptions and procedures involved in the nitrogen calculation could be refined, we agree that the net effect of such efforts relative to the strategy nitrogen goal renders these issues essentially moot. The Phase II nitrogen cap reasonably incorporates a 30% reduction for the Association, accounting for 1990 to 1991 load reduction efforts. A separate technical memorandum details the calculations that support this determination.

Subsequent to 1995, the initial Phase II nutrient caps were adjusted twice and the Agreement was modified accordingly. The caps were increased for the addition of Robersonville in 2001 and Scotland Neck in 2002 using the method described in Section III above.

For Phase IV, the parties agree to use the final Phase III end-of-pipe nitrogen cap of 889,403 lbs (404,274 kg) TN and the final phosphorus cap of 160,732 lbs (73,060 kg) TP. Should membership change during Phase IV the caps will be adjusted per the methods noted in Section III.

Table 2. End-of-Pipe Nutrient Loading Caps for Tar-Pamlico Basin Association

	Total Nitrogen (lbs/yr)	Total Phosphorus (lbs/yr)
Phase III Association Cap (15 members)	891,271 (404,274 kg/yr)	161,070 (73,060 kg/yr)
Phase IV Association Cap (16 members) [a]	891,271 (404,274 kg/yr)	161,070 (73,060 kg/yr)

[a]The City of Creedmoor has expressed interest in constructing a new treatment facility that would discharge up to 1.15 MGD of wastewater in the Tar-Pamlico basin. The City was accepted as a member in 2014 and is included here presuming it applies for and receives an NPDES discharge permit for the discharge. In March 2015 the City of Creedmoor entered into a service agreements with SGWASA that will result in their wastewater continuing to be treated by the facility. Should Creedmoor not apply for on NPDES permit no adjustment will be made to the cap. Final nutrient allocations/ limits will be determined in the course of any permitting process.

If loading exceeds either cap in any year of this Agreement, then the Association shall offset that exceedance by funding nonpoint source nutrient controls as described in Section V. Relaxation of these caps in future amendments to this Agreement would only be contemplated if monitoring and modeling results suggest all water quality standards and goals are being met and that assimilative capacity is available to the Association while maintaining a margin of safety, all consistent with the TMDL.

D. Addition of Creedmoor & Status of Former National Spinning Allocation

National Spinning was a member of the Tar-Pam Basin Association until the operation ceased discharging at the end of 2004. The Association membership was updated during Phase III and caps adjusted to reflect the removal of National Spinning. As a result 27,124 kg/yr (59,798 lb/yr) TN and 1,768 kg/yr (3,898 lb/yr) TP was removed from the caps per the calculation process described in the Section III.

Creedmoor's wastewaters are currently treated by the South Granville Water and Sewer Authority (SGWASA) which discharges in the Falls Lake Watershed. Creedmoor is exploring the possibility of building its own wastewater treatment facility in the future. In June 2010 the City of Creedmoor submitted a speculative discharge limit request to DWR for a possible 1.15 MGD BNR type wastewater treatment plant with a proposed discharge into the Tar-River. Creedmoor also applied to become a member of the Association and requested DWR reinstate a portion of the previously removed National Spinning Allocation to the Association's Cap. The Association has accepted Creedmoor as a member and the Division has indicated that a portion of the old National Spinning allocation would be made available should Creedmoor apply for and be approved for an individual NPDES permit. Final allocations / limits for the new discharge will be established once the City has satisfied any environmental review requirements for the project and submitted proper application for an NPDES permit for its discharge.

On March 28, 2015 the City of Creedmoor entered into a service agreement with SGWASA that will result in their wastewater continuing to be treated by that facility. Should

Creedmoor not apply for an NPDES permit no adjustments will be made to the cap in Table 2 of this Agreement and the National Spinning Allocation will remain retired.

E. Individual Allocations / Limits

Throughout Phase I, II, and III of this Agreement, nutrient discharges by the Tar-Pamlico point sources have been limited solely by the group caps found in the Agreement as referenced in the individual permits. By design, the Tar-Pamlico permits have not included facility specific nutrient limits, and the EPA Region 4 office had accepted that approach.

Based on guidance released by EPA's Office of Wastewater Management in 2007[3], EPA Region IV notified the Division that Section 301(b)(1)(C) of the federal Clean Water Act and federal NPDES regulations (40 C.F.R. 122.44(d)(1)) require that NPDES permits include any limitations established in or based upon an approved TMDL. The Division added the group caps for nitrogen and phosphorus in the members' permits as part of the 2009 renewals and agreed to add individual limits in 2014. The Division has worked closely with the Association and the other parties to the Agreement to determine appropriate nutrient allocations and limits for each member. The Division has also worked with the parties to develop a new NPDES group permit that effectively allows the Association to continue operating under the existing 'group caps' approach. The Division expects to implement the group and individual limits in the 2014 permit cycle and has updated this Agreement accordingly.

The group cap assigned to the Tar-Pamlico Basin Association is 891,271 lb/yr TN and 161,070 lb/yr TP as shown in Table 2. In order to apportion the group caps among individual member dischargers, the caps were divided in proportion to the maximum permitted flow in each member's permit as of 2014. Individual limits are summarized in Table 3 below provides an overview of the group permit and explains how it relates to the members' individual permits.

[3] *Watershed-based National Pollutant Discharge Elimination System (NPDES)Permitting Technical Guidance*. U.S. Environmental Protection Agency, Office of Wastewater Management, Water Permits Division. EPA 833-B-07-004. August 2007. http://www.epa.gov/npdes/pubs/watershed_techguidance_entire.pdf

Table 3. Individual Allocations / Limits for Tar-Pam Basin Association Members

Permit	Owner	Facility	TN Allocations (lbs/yr)[a]	TP Allocations (lbs/yr)[a]
Association Members				
NC0026492	Town of Belhaven	Belhaven WWTP	14,261	577
NC0042269	Town of Bunn	Bunn WWTP	4,278	773
NC0025402	Town of Enfield	Enfield WWTP	14,261	577
NC0069311	Franklin County	Franklin WWTP	42,754	7,732
NC0023931	Greenville Utilities Commission	GUC WWTP	249,576	45,103
NC0020231	Town of Louisburg	Louisburg WWTP	19,538	3,531
NC0025054	City of Oxford	Oxford WWTP	49,915	9,021
NC0020435	Town of Pinetops	Pinetops WWTP	4,278	773
NC0026042	Town of Robersonville	Robersonville WWTP	25,671	4,639
NC0030317	City of Rocky Mount	Tar River Regional WWTP	299,491	54,124
NC0023337	Town of Scotland Neck	Scotland Neck WWTP	9,626	1,740
NC0020061	Town of Spring Hope	Spring Hope WWTP	5,705	1,031
NC0020605	Town of Tarboro	Tarboro WWTP	71,307	12,887
NC0020834	Town of Warrenton	Warrenton WWTP	28,523	5,155
NC0020648	City of Washington	Washington WWTP	52,054	9,407
Total	**Allocation/ Limit (Group Cap)**	**lbs/yr**	**891,271**	**161,070**
Total	**Allocation/ Limit (Group Cap)**	**kg/yr**	**404,274**	**73,060**

[a] The total allocations / limits expressed as kg/yr are taken to be whole numbers. The total and individual expressed as lbs/yr are calculated values ; they are not whole numbers, but, for the purposes of this table, are shown to the nearest whole pound. The sum of the individual allocations may differ from the total value due to rounding.

F. Individual and Group Permit Requirements

As already noted, the Division added conditions to the members' NPDES permits in 2009 that established the TN and TP group caps as enforceable limits, subject to the terms and conditions of the Agreement. Beginning with the 2014 renewals, each member's permit will also include individual nutrient limits and related conditions. These changes in the permits are necessary to allow for appropriate enforcement in the event that group caps are exceeded.
The parties propose to use a supplemental NPDES permit to maintain the 'group compliance' approach that has been fundamental to previous Agreements. This permitting approach is designed to work as follows:

- Each member's individual NPDES permit will include its limits for TN and TP, as listed in Table 3, as well as monitoring requirements and other nutrient conditions. The group caps added to the member permits in 2009 will be moved to a group permit.

- A new group permit, issued to the Association and its members, will establish nutrient limits and associated reporting requirements. The permit will include both the group caps for the Association and the members' individual limits. The group caps are the sums of the members' individual limits and are subject to change, such as when members join or leave the Association.

- So long as a facility is a member of the Association, it will be deemed to be in compliance with the nutrient limits in its individual NPDES permit and subject to the nutrient requirements of the group permit. No other terms and conditions of its individual permit are affected by its coverage under the group permit.

- The Association members, as a group, are subject to the TN and TP caps established in the group NPDES permit. For each nutrient, so long as the Association complies with its group cap, all members are deemed to be in compliance with their individual limits in the group permit. If the Association exceeds the cap for one or both nutrients, the individual limits for the nutrients of concern become effective, and any members exceeding an individual limit are in violation of the group permit.

- The members' nutrient limits in the group permit are a reflection of the limits in their individual NPDES permits. Any change in a member's nutrient limits requires that the both the group and individual permits be modified and the change undergo public review. The group permit can then be modified to ensure that the limits in both permits agree.

All members will continue to monitor and report their nutrient discharges as specified in their individual permits, and the Association will continue to report its members' nutrient loadings.

G. Loading Targets for Nonpoint Sources

The stated goal of this Agreement is to reduce total nitrogen loading measured at Washington by 30 percent from 1991 loadings. As calculated in Phase II, this reduction from all sources amounts to 1,285,293 lbs/yr. Since the point source contributions in 1991 accounted for 8 percent of the total nitrogen loading, point source reductions also account for 8% of the reduction needed. Therefore, nonpoint source activities in the basin are assigned a reduction of approximately 1,182,470 lbs/yr at Washington (i.e., 1,285,293 X 92%) to achieve a 30 percent reduction from all sources. This goal was translated upstream to "the source" using the same 30 percent instream decay assumption used for point sources. The Phase II Agreement called for a nonpoint source strategy, which was approved by the Commission in December 1995 as a voluntary plan. It apportioned the nonpoint source reduction target among agriculture, urban, forestry, and wetlands categories based on export coefficient calculations. The Division subsequently reapportioned these allocations to the manageable nonpoint source categories of agriculture and urban.

In implementing nonpoint source management efforts during Phase II, the Division found that while instream nonpoint source loading goals were an important concept, functional application instead favored use of the N and P *percentage* reduction and maintenance targets in land-based accounting methods by nonpoint sources. Compliance with instream loading targets would have additionally required some combination of complex modeling with significant uncertainty of processes occurring between edge of management unit and the water column instream, and a significant amount of quantitative water quality monitoring to support that modeling. Given the scale of uncertainties that would be associated with such an effort and resource limitations, nonpoint source management has evolved using land-based accounting methods.

H. Loading Targets for Non-Association Facilities

The Phase II Agreement established recommendations for all non-Association dischargers: existing and expanding domestic and industrial wastewater dischargers and all new facilities to enter the basin.

Phase II Agreement recommendations for expanding and new non-Association dischargers were subsequently codified as rules 15A NCAC 2B .0229 and .0237, and became effective April 1, 1997. These rules are currently being readopted as part of legislatively mandated re-adoption of all rules. Division staff is evaluating the need to revise the requirements through that process. Currently under the rules, domestic and industrial dischargers expanding to 0.5 MGD or greater and all new dischargers are required by the rule to offset all new nutrient loads at 110 percent of the established offset rate. Payment for the life of the permit is required at issuance or renewal. The Division plans to revise the effluent limit concentrations provided in Rule 15A NCAC 2B .0229 through an ongoing rules re-adoption process which will be completed in 2016. Any new requirements adopted through the rules re-adoption process will be applied to non-Association facilities at that time.

The intent of these recommendations is to ensure that new or expanding non-Association dischargers in the basin do not result in increased nutrient loadings to the estuary. They also serve as an incentive for all facilities treating nutrient-bearing wastewaters to become Association members, in which case their impacts are regulated through this Agreement. When these requirements were first established (1995), the TN and TP concentration limits represented Best Available Technology for domestic systems reasonably well, and they were more stringent on average than the Association's limits. Since then, some Association facilities have expanded their treatment capacity and, with increased flows, the equivalent nutrient concentrations of the caps have been reduced. Members would need to treat to 4.7 mg/l TN and 0.84 mg/l TP on average, based on full permitted flow. In the same period, nitrogen treatment capabilities have improved considerably. The result is that not only are the 6&1 limits previously specified in the Agreement an out-of-date measure of BAT for domestic facilities but they are also considerably less stringent than the limits the Association members must meet under design flow conditions.

As part of the legislatively required re-adoption of all rules, in 2B .0229 the Division will propose to shift non-Association offsets from the ACSP to the Division of Mitigation Services (DMS), formerly the Ecosystem Enhancement Program, while leaving the Association cap exceedance offsets under the current ACSP model as discussion in Section V. Use of DMS for non-Association offsets is based on the in-perpetuity nature of non-Association loads increases and the conforming design of the DMS offset program, as opposed to the limited duration of reductions typically provided under the ACSP, which complement discrete cap exceedances that the Association may produce.

During Phase III, no expanding nor new dischargers were issued permits pursuant to these requirements. Appendix B provides tables of all dischargers sorted by permitted flow.

V. Nutrient Offset Program

The purpose of this agreement is to allow Association facilities to achieve the Division's nutrient reduction goals by funding other more cost-effective nutrient reduction measures than the cost of meeting effluent limits at the Association facilities. This alternative involves funding nonpoint source controls that achieve reductions in nutrient loading to the estuary at least equivalent to the magnitude of cap exceedances in a given year.

A. Offset Options

The Phase II Agreement established certain nonpoint source management options for Association funding to offset cap exceedances. The parties agree to continue providing the following options for Phase IV of the Agreement:

- Implementation of certain nutrient-reducing agricultural BMPs under the NC Agriculture Cost Share Program. Soil and Water shall administer offset funds for this purpose. Funds shall be allocated to operations within the Tar-Pamlico River Basin, and shall be targeted geographically and by practice for the most cost-effective nutrient reductions to the estuary practicable. Soil and Water shall track and report the

disposition of these funds to the Division annually. Soil and Water shall ensure and demonstrate that offset-funded BMPs are separate from and in addition to BMPs implemented to meet requirements of the Tar-Pamlico agriculture rule.

- Support for operation and maintenance of a continuous flow gauging station in the Tar River at Greenville or other mainstem location as close as practical to the estuary.

B. Offset Credits

1. **Flat Rate.** To date the Agreement has used a flat offset rate that was established for Phase II and will continue until updated in Phase IV at $13.15 of nitrogen in excess of the annual cap. This flat rate was based on a report by Research Triangle Institute entitled *Cost-Effectiveness of Agricultural BMPs for Nutrient Reduction in the Tar-Pamlico Basin* (January, 1995), which included a safety factor and an administrative cost factor. During Phase III parties to the Agreement discussed ways to update the nitrogen offset rate and establish a phosphorus offset rate in a manner that would utilize actual projected load reductions and costs, including uncertainty estimates and associated issues and cost factors as itemized below. During the first two years of Phase IV, the Division shall work in consultation with the parties to develop improvements to the offset rate that address the following issues:

    - Develop an offset rate for exceedances of the phosphorus cap.
    - Update cost-effectiveness data developed in the 1995 RTI report.
    - Add BMPs not addressed in the 1995 RTI report and quantifiable based on current research.
    - Factor uncertainty into cost-effectiveness estimates.
    - Project proportionate BMP implementation for the foreseeable future.
    - Explore the ability to establish single, weighted nitrogen and phosphorus cost-effectiveness values based on proportional use;
    - Seek to account for spatial distribution within the basin as well.
    - Revisit the administrative cost factor.

During Phase IV parties will develop an updated nitrogen offset rate and establish a phosphorus offset rate that captures the full actual costs of implementing agricultural BMPs under the NC Agriculture Cost Share Program. Parties to the Agreement will work together to develop costs for the following implementation elements to consider when updating offset rates, as applicable:

- Design, planning and engineering
- Recruitment and outreach by the soil & water conservation district staff
- Land costs
- Implementation and construction
- Operation and maintenance
- Inspection costs
- Regulatory costs for DWR and DSWC technical assistance and administration

Once established, the Phase IV nitrogen and phosphorus offset rates shall be revisited at least once every five years to consider new information and incorporate future updates. To replace the current offset rate with the results of this effort, the Division shall present any modifications to the Agreement to the Commission for approval by January 1, 2017 or as soon as practicable thereafter.

2. **Banked Credit Life.** Over the course of Phase I, II, and III the Association made payments towards various creditable measures and activities. A summary of these payments and credits is provided in Appendix C. These banked credits fall into two distinct categories. The first being credits earned for funding nutrient reducing BMPs. The second category is more administrative in nature in the form of credits earned for funding a flow gauge and coordinator position. During the course of Phase III, the Division worked with the parties to resolve questions related to the longevity of these banked credits and the rate at which banked credits can be redeemed. The parties have resolved these questions for existing banked credits and established guidance on the disposition of future payments for banked credit. Parties agree that in the future up to 10% of a load exceedance can be offset with the banked credit earned by funding the gauge and coordinator in a given calendar year while the banked credit balance from funding nutrient BMPs can be used in any amount as an offset. Furthermore, banked credit that was earned by funding Agriculture Cost Share BMPs shall expire at such time the BMP contract for the funded BMP expires under the Agriculture Cost Share Program. This is based on the premise that continued operation, maintenance and continued nutrient reduction performance can no longer be assured for the BMP once the contract expires.

3. **Banked Credit History & Status**

   The section below details the credits earned during each Phase of the Agreement. Details of payments and credits during each phase of the Agreement are provided in the credit register located in Appendix C.

   - **Phase I Credits:** During the first phase of this Agreement (1990-1994) the Association funded a series of agriculture BMPs through a combination of Association funds and federal grants. Phase I credit history is captured in the credit register in Appendix C. As of 2015 the remaining credit balance is 4,923 lbs of N.

   - **Phase II Credits:** The Association did not exceed its caps during Phase II, but did make payments to fund the flow gauge and partially fund the DSWC staff position. With these payments, the Association banked credit toward future cap exceedances at the $13.15/lb rate. As tabulated in Appendix C, the Association accumulated $399,193 in advance offset payments for 30,356 lbs N reduction credit.

- **Phase III Credits:** As in Phase II, the Association did not exceed its caps during Phase III, but continued to provide partial funding for the coordinator position until it was eliminated in 2006. The Association also continued to fund the flow gage at Greenville. With these payments the Association banked credit toward future cap exceedances at the $13.15/lb rate. As tabulated in Appendix C, the Association accumulated an additional $220,267 in advance offset payments for an additional 16,712 lb N reduction credit for a total of 47,857 lbs of N reduction credits (Phase II + Phase III).

- **Phase IV Credits:** The Association may continue to earn banked credit for funding the Greenville flow gauge, which will be handled similar to past credit earned in this manner in that these credits are eligible to be used towards offsetting up to 10% of a load exceedance in a given calendar year

4. **Payment Schedule.** Under this Agreement, the Association shall develop annual loading projections to predict anticipated loading cap exceedances. If the Association exceeds 85% of its TN or TP limitation in any calendar year, the Association shall, no later than July 1 of the following year, evaluate the effectiveness of its members' nutrient controls, identify improvements sufficient to ensure continued compliance with the nutrient limits, and submit to the Division a report of its findings, proposed treatment improvements and related actions, and a timeline for implementing the proposed measures. At such time as the Association determines it expects to exceed either nutrient cap in the upcoming calendar year, and no banked credits reamain, it shall make the appropriate offset payment in advance of the cap exceedance and no later than July 1 of the year prior to the predicted cap exceedance. Also by that date, the Association shall request modification of the group NPDES permit in order to increase the group limit accordingly prior to the predicted exceedance.

   Advance payment of the nutrient offset payment will allow time for the offset measure to be implemented and the allocations and limits in the group permit to be adjusted to reflect the onetime offset payment in anticipation of the exceedance. Any offset payments made in July will be re-evaluated when the annual report is submitted in March of the following year. Any excess offset payments will be credited as a banked nutrient offset credit and be available for future use.

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.

VI. Minimum Conditions to this Agreement

The parties agree 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 the Division every March 1 detailing this monitoring data from the previous year. The annual report will be used to determine compliance with this strategy. The Division may authorize less frequent monitoring (i.e., other than weekly) where the discharger demonstrates that less frequent sampling is adequate to characterize facility loadings. All facilities shall abide by monitoring protocols defined or referenced in their NPDES permits.

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 the Division using the best available data.

Although not a requirement under this Agreement, during Phase III the Association took the additional step of forming a Monitoring Coalition in March 2007. The Association currently collects monthly samples at 37 stations throughout the basin. The water quality data collected by the Association is submitted to DWR within 90 days of the end of the month in which the sampling was performed. The Association annual report formally finalizes the water quality data.

The monitoring performed by the monitoring coalition under the Memorandum of Agreement (MOA) with DWR does not affect the effluent monitoring required here. Rather, under the MOA the TPBA members are exempted from instream monitoring as specified in their individual NPDES permits. The current monitoring MOA between the Association and DWR was effective March 1, 2012 and runs through February 28, 2017. Details of the monitoring plan can be found in the MOA document on DWR's website at http://portal.ncdenr.org/web/wq/ess/eco/coalition.

B. Evaluation of Progress

To evaluate progress towards the strategy reduction goal, the Division conducted estuary use support assessment and nutrient loading trend evaluation for the 2014 Tar-Pamlico Basinwide Plan. Results of this evaluation indicate the estuary nutrient reduction goals have not been met at this time. The Division will continue to conduct estuary use support assessment and loading trend analysis as part of future basin plans. A summary of the most recent use support assessment and trend analysis methods and results is provided in the 2014 Basinwide Plan. An electronic copy of the plan can be found on the Division website at http://portal.ncdenr.org/web/wq/ps/bpu.

The Division is currently conducting a rules re-adoption process where it will seek to strengthen elements of the existing nutrient management strategy rules. In addition, the 2014 basinwide plan includes other recommendations the Division intends to pursue that include addressing research needs and gaps in the current management strategy. This ongoing work will provide information that can be used towards improving the implementation of nutrient reduction activities beyond the current proposed rule revisions, which will assist in achieving the nutrient strategy reduction goals.

VII. Local Water Quality Impacts

This Agreement does not preclude the Division from requiring additional nutrient controls by individual point sources where a localized water quality problem exists. If the Division determines that a member's TN or TP discharge has reasonable potential to cause localized water quality impacts, it may determine and assign an individual water quality-based limit for TN, TP, or both, as appropriate, for the Member in accordance with applicable NPDES rules. The Division will then propose to incorporate the new limit(s) into the Member's individual NPDES permit and this group permit according to standard permitting procedures. Once an individual WQBEL becomes effective in the group permit, the Member is subject to that limit in lieu of the Association TN or TP Limit. The Division shall provide copies of any proposed WQBEL so that parties to the Agreement may provide timely comments on the proposed agency action.

VIII. Decision-Making Authority

The Division shall have final decision-making authority with regard to the adequacy of nutrient offsets and allocations. 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. This provision does not affect any appeal rights of the signatory parties with regard to such decisions.

IX. Nonpoint Source Controls

The Phase II Agreement called for a nonpoint source strategy, which was approved by the Commission in December 1995 as a voluntary plan. The Commission then received two annual reports on the progress of implementation under this voluntary plan before it that progress was insufficient and initiated rulemaking for nonpoint sources. Modeled after rules implemented in the adjacent Neuse River Basin in 1998, a set of rules addressing four subject areas went into effect during 2000 and 2001:

1. Agriculture
2. Urban stormwater
3. Riparian buffer protection
4. Fertilizer management

The agricultural community was required to achieve a collective 30% reduction in nitrogen losses within 5 years, and to ensure no increase in phosphorus losses within four years of the development of a phosphorus accounting method. Under the stormwater rule, 5 counties and 6 municipalities

were required to regulate new development to achieve 30% reduction in nitrogen export and no increase in phosphorus export from basinwide average pre-development conditions. These local governments were also required to identify and eliminate illicit discharges to the stormwater system, conduct education programs, and identify retrofit sites on existing developed lands. The riparian buffer rule established protections for existing riparian areas 50 feet in width basinwide, and required establishment of such buffers where none exist upon change of land use. The nutrient management rule requires fertilizer applicators basinwide to either have certified plans in place for lands to which they apply fertilizer, or to take training within 5 years on developing such plans. Homeowners were not subject to this requirement; instead the Division was to develop and implement an education program targeting homeowners.

The nonpoint source rules have been fully implemented as of 2006. Agriculture exceeded its goal by 2004, with annual reports currently estimating nitrogen loss reductions exceeding 40%. Approximately 1,600 applicators were trained under the nutrient management strategy. Under the stormwater rule local governments have been implementing their new development permitting requirements through their locally adopted stormwater ordinances and programs since 2004. Additionally, the riparian buffer rule has been enforced by the Division since 2000.

In addition to the nutrient strategy's nonpoint source rules, other nonpoint source control initiatives in the Tar Pamlico River Basin continue beyond the terms of this Agreement. Several of the major initiatives include the following voluntary and regulatory programs:

- State and federal regulation of confined animal operations,
- Phase II of federal NPDES stormwater regulation, encompassing several urbanized areas in the Basin,
- State Coastal stormwater regulation applicable to Beaufort County,
- State-mandated local stormwater regulation in Water Supply Watersheds throughout the Basin,
- State regulations protecting High Quality Waters and waters supporting listed aquatic species,
- State and federal wetlands and stream protection and mitigation regulations,
- A host of state and federal agriculture cost share and incentive programs, and technical assistance and education for farmers,
- NC Nonpoint Source Management Program providing state-wide and coastal NPS goal-setting, coordination, and grant funding (CWA Section 319) for protection and restoration of water quality related to nonpoint sources of pollution,
- Other Clean Water Act water quality grant programs including Sections 104(b)(3) and 106, and
- Clean Water Management Trust Fund, a state grants program funding a range of water quality protection and improvement activities.

X. Termination of this Agreement

In the event that this Agreement is terminated for any reason, nutrient discharges by members of the Association shall be subject to the limits and other nutrient requirements of the group NPDES permit or, if no such permit has been issued and is effective, those in their individual permits. The Division may also evaluate the need for additional rulemaking to regulate point sources.

Tar-Pamlico Nutrient Sensitive Waters Implementation Strategy: Phase IV

Agreed to on July 9, 2015 by:

_____
S. Jay Zimmerman, P.G.
Director, Division of Water Resources

_____
Patt Harris
Director, NC Department of Agriculture & Consumer Services Division of Soil and Water Conservation

_____
Adam Waters
Chairman, Tar-Pamlico Basin Association

Approved by:

_____
Gerard P. Carroll
Chairman, NC Environmental Management Commission

ANNUAL NUTRIENT LOADS AND CAPS, TAR-PAMLICO BASIN ASSOCIATION

PHASE I

Combined N+P	1991[1]	1992[1]	1993[1]	1994[1]
Loading Cap [a] (lb/yr)	1,157,426	1,102,310	1,047,195	936,964
Actual Load (lb/yr)	1,017,198	961,497	919,805	818,355
Load as % of Cap	88	87	88	87
Average Flow (MGD)	24.88	26.86	28.46	26.65

PHASE II

Separate N, P	1995[2]	1996[2]	1997[2]	1998[2]	1999[2]	2000[2]	2001[3]	2002[4]	2003[4]	2004[4]
Loading Cap [a] (lb/yr)	N: 893,435 P: 153,759	N: 893,435 P: 153,759	N: 893,435 P: 153,759	N: 893,435 P: 153,759	N: 893,435 P: 153,759	N: 893,435 P: 153,759	N: 930,288 P: 161,070	N: 930,288 P: 162,467	N: 930,288 P: 162,467	N: 930,288 P: 162,467
Actual Load (lb/yr)	N: 821,402 P: 82,365	N: 780,918 P: 95,385	N: 706,955 P: 80,539	N: 760,111 P: 81,271	N: 682,277 P: 70,662	N: 656,950 P: 66,749	N: 617,201 P: 72,157	N: 615,817 P: 75,125	N: 682,824 P: 68,026	N: 576,352 P: 74,911
Load as % of Cap	N: 92 P: 54	N: 87 P: 62	N: 79 P: 52	N: 85 P: 53	N: 76 P: 46	N: 74 P: 43	N: 66 P: 45	N: 65 P: 46	N: 72 P: 42	N: 61 P: 46
Average Flow (MGD)	31.03	33.57	29.84	33.31	33.39	32.74	30.21	30.54	36.86	29.65

ANNUAL NUTRIENT LOADS AND CAPS, TAR-PAMLICO BASIN ASSOCIATION

PHASE III

Separate N, P	2005[5]	2006[5]	2007[5]	2008[5]	2009[5]	2010[5]	2011[5]	2012[5]	2013[5]
Loading Cap [a] (lb/yr)	N: 891,271 P: 161,070	N: 891,271 P: 161,070	N: 891,271 P: 161,070	N: 891,271 P: 161,070	N: 891,271 P: 161,070	N: 891,271 P: 161,070	N: 891,271 P: 161,070	N: 891,271 P: 161,070	N: 891,271 P: 161,070
Actual Load (lb/yr)	N: 533,562 P: 86,569	N: 512,724 P: 103,606	N: 543,362 P: 110,401	N: 559,572 P: 96,609	N: 602,038 P: 89,781	N: 637,916 P: 82,369	N: 646,531 P: 99,966	N: 624,664 P: 101,805	N: 600,688 P: 99,190
Load as % of Cap	N: 60 P: 54	N: 58 P: 64	N: 61 P: 69	N: 63 P: 60	N: 67 P: 56	N: 72 P: 51	N: 73 P: 62	N: 70 P: 63	N: 67% P: 62%
Average Flow (MGD)	29.21	32.85	27.05	27.39	28.0	30.5	28.6	30.5	34.1

- Loads estimated by NC Division of Water Quality. Equal to the sum of calendar-year monthly load values for each facility, which are based on minimum biweekly nutrient concentrations and daily mass flows.

[a] Cap values and changes result from the following:
1. Phase I – Original 12-member Association.
2. Phase II through 2000 – 14-member Association.
3. 2001 – Robersonville added, 15-member Association.
4. 2002 – Scotland Neck added, 16-member Association.
5. 2005 – National Spinning removed, 15-member Association in Phase III

APPENDIX B

Table of Point Source Dischargers to the Tar-Pamlico River Basin

Permit	Owner	Facility	Permitted Flow (MGD)	Sub-basin	Receiving Stream
Association Members					
NC0030317	City of Rocky Mount	Tar River Regional WWTP	21.0	02	TAR RIVER
NC0023931	Greenville Utilities Commission	GUC WWTP	17.5	05	TAR RIVER
NC0020605	Town of Tarboro	Tarboro WWTP	5.0	03	TAR RIVER
NC0025054	City of Oxford	Oxford WWTP	3.5	01	Fishing Creek
NC0020648	City of Washington	Washington WWTP	3.65	07	TAR RIVER
TBD	City of Creedmoor	Creedmoor WWTP*	TBD	TBD	TBD
NC0069311	Franklin County	Franklin County WWTP	3.0	01	Cedar Creek
NC0020834	Town of Warrenton	Warrenton WWTP	2.0	04	Fishing Creek
NC0026042	Town of Robersonville	Robersonville WWTP	1.8	06	Flat Swamp
NC0020231	Town of Louisburg	Louisburg WWTP	1.37	01	TAR RIVER
NC0026492	Town of Belhaven	Belhaven WWTP	1.0	07	Battalina Creek
NC0025402	Town of Enfield	Enfield WWTP	1.0	04	Fishing Creek
NC0023337	Town of Scotland Neck	Scotland Neck WWTP	0.675	04	Canal Creek
NC0020061	Town of Spring Hope	Spring Hope WWTP	0.4	02	TAR RIVER
NC0020435	Town of Pinetops	Pinetops WWTP	0.3	03	Town Creek
NC0042269	Town of Bunn	Bunn WWTP	0.15	01	Crooked Creek
		Total Permitted Flow =	**62.35**		

* City of Creedmoor only a proposed discharge at this time. Permitted flow, Sub-basin, and stream are to be determined.

APPENDIX B (CONTINUED)

Permit	Owner	Facility	Permitted Flow (MGD)	Sub-basin	Receiving Stream
Non-Association Domestic Less than 0.05 MGD					
NC0036919	Town of Pantego	Pantego WWTP	0.006	07	Pantego Creek
NC0040584	Pantego Rest Home	Pantego Rest Home	0.004	07	Pantego Creek
NC0037231	Martin County Schools	Bear Grass El Sc WWTP	0.005	06	Turkey Swamp
NC0038580	Halifax County Schools	Eastman M School WWTP	0.0048	04	Little Fishing Creek
NC0038610	Halifax County Schools	Pittman El School WWTP	0.0096	04	Burnt Coat Swamp
NC0038644	Halifax County Schools	Dawson El School WWTP	0.0073	04	Deep Creek
NC0050415	Edgecombe County Schools	Phillips Middle School	0.010	02	Moccasin Creek
NC0050431	Edgecombe County Schools	North Edgecombe H Sl	0.02	02	Swift Creek
NC0037885	Nash/Rocky Mount Schools	Southern Nash Junior H S	0.015	02	TAR RIVER
NC0047279	C&J Bradshaw LLC	Heritage Meadows WWTP	0.010	01	North Fork Tar River
NC0029131	Kittrell Job Corps Center	Kittrell Job Corps Center	0.025	01	Long Creek
NC0048631	Interstate Property Mgmt Inc	Long Creek Court WWTP	0.007	01	Long Creek
Non-Association Domestic 0.05 to 0.5 MGD					
NC0069426	Dowry Creek Community Assc.	Dowry Creek	0.05	07	Pungo River
NC0021521	Town of Aurora	Aurora WWTP	0.12	07	South Creek
NC0025691	Town of Littleton	Littleton WWTP	0.28	04	Butterwood Creek
NC0050661	Town of Macclesfield	Macclesfield WWTP	0.175	03	Bynums Mill Creek
NC0042510	Total EnvSolutions Inc	Lake Royale WWTP	0.080	01	Cypress Creek
Non-Association Domestic 0.5 MGD or Greater					
None					
Non-Association Industrial Discharging Nutrients					
NC0003255	PCS Phosphate Company Inc	PCS Phosphate Co- Aurora	NL	07	PAMLICO RIVER
NL = No Limit					
		Total Permitted Flow =	**0.83**		

APPENDIX C

Association Nitrogen Offset Credit Register

Date of Funding Check	Purpose of Funds	Funds Origin	Payment	Cumulative Payment	Offset Rate ($/lb N)	N Credit (lb)	BMP N Credit Balance (lbs), 12/31/17 Expiration*	Gaug & Coordinator N Credit Balance (lbs)
Phase I								
9/30/1992	Agriculture BMPs	TPBA	$ 150,000	$ 150,000	$25.40	5,905	5,905	
9/30/1992	Chicod Creek BMPs	EPA 104(b)3	$ 250,000	$ 400,000	$25.40	9,842	15,748	
9/30/1992	Chicod Creek BMPs	EPA 104(b)3	$ 100,000	$ 500,000	$13.15	7,604	23,352	
9/30/1993	Daniel's/Nutrient BMPs	EPA 104(b)3	$ 350,000	$ 850,000	$13.15	26,615	49,967	
Remaining Phase I Credits							**4,923***	
Phase II								
5/31/1996	Coordinator position	TPBA	$ 30,000	$ 30,000	$13.15	2,281		2,281
6/30/1996	Coordinator position	TPBA	$ 22,860	$ 52,860	$13.15	1,738		4,019
7/26/1996	Greenville gauging station	TPBA	$ 33,600	$ 86,460	$13.15	2,555		6574
11/20/1997	Greenville gauging station	TPBA	$ 17,100	$ 103,560	$13.15	1,300		7874
7/7/1998	Coordinator position	TPBA	$ 30,000	$ 133,560	$13.15	2,281		10,155
6/4/1999	Coordinator position	TPBA	$ 30,000	$ 163,560	$13.15	2,281		12,436
12/5/1999	Greenville gauging station	TPBA	$ 17,800	$ 181,360	$13.15	1,353		13,789
12/29/2000	Greenville gauging station	TPBA	$ 18,700	$ 200,060	$13.15	1,422		15,211
7/9/2001	Coordinator position	TPBA	$ 30,000	$ 230,060	$13.15	2,281		17,492
12/5/2001	Greenville gauging station	TPBA	$ 17,700	$ 247,760	$13.15	1,346		18,838
4/4/2002	Coordinator position	TPBA	$ 30,000	$ 277,760	$13.15	2,281		21,119
2/26/2003	Greenville gauging station	TPBA	$ 18,100	$ 295,860	$13.15	1,376		22,495
5/6/2003	Coordinator position	TPBA	$ 30,000	$ 325,860	$13.15	2,281		24,776
1/7/2004	Greenville gauging station	TPBA	$ 18,100	$ 343,960	$13.15	1,376		26,152
6/16/2004	Coordinator Position	TPBA	$ 30,000	$ 373,960	$13.15	2,281		28,433
11/8/2004	Greenville gauging station	TPBA	$ 25,233	$ 399,193	$13.15	1,918		30,351

APPENDIX C (Continued)

Association Nitrogen Offset Credit Register

Date of Funding Check	Purpose of Funds	Funds Origin	Payment	Cumulative Payment	Offset Rate ($/lb N)	N Credit (lb)	BMP N Credit Balance (lbs), 12/31/17 Expiration*	Gauge & Position N Credit Balance (lbs)
Phase III								
4/21/2005	Coordinator Position	TPBA	$ 30,000	$ 429,193	$13.15	2,281		32,632
12/19/2005	Greenville gauging station	TPBA	$ 25,233	$ 444,427	$13.15	1,918		34,550
3/16/2006	Coordinator Position	TPBA	$ 30,000	$ 474,427	$13.15	2,281		36,831
1/30/2007	Greenville gauging station	TPBA	$ 20,233	$ 494,600	$13.15	1,538		38,369
5/12/2009	Greenville gauging station	TPBA	$ 22,200	$ 517,860	$13.15	1,688		40,057
5/12/2009	Greenville gauging station	TPBA	$ 21,600	$ 538,460	$13.15	1,642		41,699
1/19/2010	Greenville gauging station	TPBA	$ 4,725	$ 543,185	$13.15	359		42,058
4/8/2010	Greenville gauging station	TPBA	$ 4,725	$ 547,910	$13.15	359		42,417
7/12/2010	Greenville gauging station	TPBA	$ 4,725	$ 552,635	$13.15	359		42,776
9/16/2010	Greenville gauging station	TPBA	$ 4,725	$ 557,360	$13.15	359		43,135
7/27/2011	Greenville gauging station	TPBA	$ 14,100	$ 571,460	$13.15	1,072		44,207
9/21/2011	Greenville gauging station	TPBA	$ 4,800	$ 576,260	$13.15	365		44,572
1/13/2012	Greenville gauging station	TPBA	$ 4,800	$ 581,060	$13.15	365		44,937
4/12/2010	Greenville gauging station	TPBA	$ 4,800	$ 585,860	$13.15	365		45,302
6/5/2012	Greenville gauging station	TPBA	$ 4,800	$ 590,660	$13.15	365		45,667
9/17/2012	Greenville gauging station	TPBA	$ 4,800	$ 595,460	$13.15	365		46,032
2/26/2013	Greenville gauging station	TPBA	$ 4,800	$ 600,260	$13.15	365		46,397
4/23/2013	Greenville gauging station	TPBA	$ 4,800	$ 605,060	$13.15	365		46,762
7/8/2013	Greenville gauging station	TPBA	$ 4,800	$ 609,860	$13.15	365		47,127
9/11/2013	Greenville gauging station	TPBA	$ 4,800	$ 614,660	$13.15	365		47,492
1/14/2014	Greenville gauging station	TPBA	$ 4,800	$ 619,460	$13.15	365		47,857
Total Phase II + Phase III Credits								**47,857**

Note:
Phase I banked credits that were earned by funding Ag Cost Share BMPs shall expire when BMP contract for the funded BMP expires under the Ag Cost Share Program. The Table in Appendix D details the credit value of remaining active Ag BMP contracts funded in Phase I. These Phase I credits will expire by calendar year 2017. Credits earned for funding the gauge and coordinator position during Phase II, III, and IV will remain available as outlined in Section V.B.2 of this Agreement.

APPENDIX D

Value of Active Agriculture Cost Share BMP Contracts Funded by Association

Year	# of Contracts Remaining	Total Offset Value of Active Contracts	Offset Credit (lb)
2015	15	$64,740.00	4,923
2016	12	$54,557.00	4,148
2017	0	$0.00	0