State of North Carolina
Department of Environment, Health and Natural Resources

Report of Proceedings on the Proposed Neuse River Basin Nutrient Sensitive Waters (NSW) Management Strategy

Environmental Management Commission Meeting
June 12, 1997

Public Hearings

November 12, 1996
State Highway Building
Raleigh, NC

November 14, 1996
Craven County Courthouse
New Bern, NC

November 19, 1996
Goldsboro High School Auditorium
Goldsboro, NC

November 21, 1996
J.H. Sampson Elementary School Auditorium
Kinston, NC

Printed on June 4, 1997

Reprinted July 1997. Please see insert following cover page for rule update.

Update to Neuse NSW Report of Proceedings

At their June 12, 1997 meeting, the North Carolina Environmental Management Commission (EMC) took the following actions on proposed rules for the Neuse Nutrient Sensitive Waters (NSW) Management Strategy:

- approved the entire package of nine rules that make up the NSW strategy for re-notice and solicitation of additional public comment (see yellow pages 32-55 in this Report of Proceedings). The rules were approved with the following text changes (amended text is underlined):
  - amended 15A NCAC 2B .233 in paragraph (1):
    "Existing riparian areas shall be protected and maintained in accordance with Sub-Items (3)(a)-(e) on all sides of surface waters in the Neuse River Basin <u>(intermittent streams, perennial streams, lakes and estuaries) as indicated on the most recent versions of the United States Geological Survey 1:24,000 scale (7.5 minute quadrangle) topographic maps or other site-specific evidence.</u> This rule only applies to riparian areas where forest vegetation is established in Zone 1 (as described in Sub-Item 3(a)) as of <u>June 12, 1997."</u>
  - amended 15 A NCAC 2B .0238 in paragraph (8):
    "A forested riparian area, as described in Sub-Item (8)(a) of this Rule, is required on all sides of surface waters in the Neuse River Basin <u>(intermittent streams, perennial streams, lakes and estuaries) as indicated on the most recent versions of the United States Geological Survey 1:24,000 scale (7.5 minute quadrangle) topographic maps or other site-specific evidence."</u>

- granted permission to renotice the proposed rules and bring them to public hearing. (Because the rules are substantially different from the rules that went to public hearing last fall, they have to be renoticed for public review and comment, in accordance with the North Carolina Administrative Procedure Act.)
- adopted a temporary rule (15A NCAC 2B .0233) that provides for protecting and maintaining existing vegetated streamside areas with an effective date of July 22, 1997, and
- adopted two resolutions, one to recommend that the General Assembly consider implementing a statewide levy on bagged fertilizers to provide funds for Cooperative Extension to educate landowners about nutrient management, and one to work with other agencies and commissions to ensure implementation of rules for maintaining existing forested streamside areas.

All of the proposed rules, including the temporary rule, will be renoticed for 60 days beginning September 15, 1997 for public comment. A revised fiscal analysis will also be prepared and made available for public review during the public comment period. Two public hearings will be held in early October 1997 to solicit additional public comment. The proposed permanent rules will be brought back to the EMC as early as possible (probably in December 1997 or possibly a special session in January 1998) for final adoption.

Desktop/neuse NSW/1997 misc/Neuse- ROP reprint insert 7/97

300 copies of this public document were printed at a cost of $454.92 & or $1.52 per copy.

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Water Quality

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
A. Preston Howard, Jr., P.E., Director

DEHNR

June 4, 1997

TO: Interested Parties

FROM: Greg Thorpe

SUBJECT: Errata Sheet for copies of the *Report of Proceedings on the Proposed Neuse River Basin NSW Management Strategy* printed prior to June 4,1997

The original *Report of Proceedings on the Proposed Neuse River Basin NSW Management Strategy* has been edited for typographical and grammatical errors. No changes have been made to the wording, context, or intent of any proposed rule. If the reader is in possession of a copy of this document that does not have a date of printing specified on the cover, then the document was issued prior to June 4, 1997 and the following corrections should be noted. Specific corrections are presented by major heading and page number with changes and additions denoted by strikethrough and underlining.

In the summary information outside the proposed rules, the terms "wetland," "buffer," and "riparian area" were edited for consistency in usage. In addition, "Landcover" and "landuse" terms were changed to "land cover" and "land use" and edited for consistency in usage.

Throughout the summary section on *Agricultural Best Management Practices for Nitrogen Reduction*, the text was edited to clarify that the responsibilities for carrying out Option 1 of this component are delegated by the EMC to qualified employees of the Department, who are members of the Basin Oversight Committee and County Advisory Committees and employees of DWQ and DSWC.

General Comments

Page 5:

In order to provide adequate time for building and installing BMPs, agriculture has been given 5 years to implement the requirements in the revised proposal (the same time frame given to all other categories.)

Page 6:

Using this information and some estimates of how much nitrogen is deposited ~~form~~ from the air, the best scientific estimate available thus far indicates that agriculture is responsible for ~~over 70%~~ approximately 69% of the nonpoint source nitrogen load above background levels.

Water quality problems in the Neuse River Basin are caused by both point source and nonpoint source pollution. NPS controls, whether voluntary or mandatory, are necessary since point source discharge could be completely eliminated and we still would not achieve the 30% nitrogen reduction goal ~~mandated~~ established by the General Assembly.

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Wastewater Discharge Comments

Page 10:

Response: The draft rules have been modified to allow new dischargers into the basin. However, ~~all~~ new dischargers if not established to resolve water quality problems from existing failing subsurface systems, will have to purchase a portion of the point source allocation from other point sources or from the nonpoint source allocation to ensure that the reduction goal is met (offset payments to be made at a rate of 200% of the cost of ~~to~~ implementing practices to reduce nonpoint source loadings). Additionally, the proposed facility will have to document that discharge is the only feasible disposal option and will be required to install nutrient removal technology to meet an annual mass load based on a concentration of 3.5 mg/l of total nitrogen.

Stormwater Management Comments

Page 13:

Response: Since this use of fertilizer would be difficult to regulate and may represents a small portion of the nitrogen loss in the basin, DWQ encourages educational programs through the Neuse local stormwater programs to teach citizens how to improve management of fertilizer and other sources of nitrogen.

Response: The local stormwater management programs would be tailored to reduce nitrogen loading ~~in urban stormwater~~ from existing development through programs such as public education about fertilizer usage, an illegal discharge program to identify potential illegal sources of nitrogen to the storm sewer and identification of areas suitable for stormwater retrofits ~~to remove nitrogen for other available funding~~ that could be funded through various sources.

Page 14:

Response: If ~~new statutory authority to delegate the responsibility for stormwater management to local governments is obtained and~~ an affected local government can show it has in place an existing stormwater program that meets the goal of reducing nitrogen from both existing and new developments by 30%, then the program will be acceptable for meeting the requirements of this rule.

Nutrient Management Comments

Page 15:

Response: The nutrient management requirement has been revised so that it no longer includes ~~a different threshold between agricultural lands and private and public recreational lands~~ differing thresholds for agricultural and non-agricultural lands. Under the revised nutrient management requirement, any person applying to a total area larger than 50 acres per year of agricultural lands, recreational lands, right-of-ways, or lawns and gardens is subject to the nutrient management requirement.

Stormwater Management

Page 19:

~~The DWQ is pursuing legislation to secure legal authority to delegate the stormwater program at the local level.~~ The DWQ will have one year from the effective date of the rules to provide a model stormwater management plan addressing all of the components listed above. ~~Under the delegation authority, local~~ Local governments will then have six months to submit a local stormwater management plan based upon the DWQ model. All of the subject local governments must have a stormwater management program in

place within 2 years of the effective date of the rules. ~~If the DWQ fails to secure authority to delegate a local program, or if~~ If a local government fails to adequately establish its stormwater management program, then the DWQ will issue a NPDES stormwater permit to implement the stormwater program for that local government.

Agricultural Reduction Goal
Page 20:
Using the original 1992 export coefficient database developed by Research Triangle Institute, nitrogen export coefficients were developed for each of the five ~~classes~~ aggregated classes of land cover based on 113 ~~studies~~ research sites primarily from piedmont and coastal areas in the southeastern and mid-Atlantic United States.

Page 21:
The total nonpoint source load attributed to MHP was approximately ~~3~~ 4%.

Even though the overall goal of the NSW strategy is to reduce nitrogen loading to the Neuse River estuary, it should be noted that the atmospheric loading goal presented here is for the area of the basin above New Bern, since the 30% reduction will be calculated for nitrogen loading delivered at New Bern. The majority of atmospheric deposition to open water in the Neuse River Basin occurs below New Bern. Atmospheric loading of nitrogen below New Bern may represent a significant source of nitrogen to the estuary. As scientific research progresses on atmospheric transport and deposition of nitrogen, sources such as animal waste, and estuary hydrodynamics, better information will be available to refine the overall strategy for managing atmospheric sources of nitrogen in the Neuse River Basin and its airshed.

Agricultural Best Management Practices for Nitrogen Reduction
Page 22:
Under the revised proposal, ~~each~~ persons engaging in agricultural operations in the Neuse River Basin have two options for meeting the nitrogen net loading reduction.

All persons engaging in agricultural operations that choose to participate in the county nitrogen reduction plans must complete a sign-up process. If an agricultural operation does not complete the sign-up, then it will be subject to implementation of standard Best Management Practices (Option 2).

Nutrient Management
Page 27:

2. Persons who apply fertilizer to 50 or more acres of golf course, ~~or other~~ recreational lands, right-of-way, or other turfgrass areas in a calendar year;
3. Persons who commercially apply fertilizer to 50 or more acres of lawn and garden areas in residential, commercial or industrial areas.

Page 56:
History and Schedule of Rule Making

The schedule in the original *Report of Proceedings* has been modified to reflect an additional public review and comment period of 60 days following the June 1997 Environmental Management Commission meeting for rules that are "substantially different" (according to N.C.G.S. 150B-21.2(g)) from the rules that went to public hearing. The proposed effective date remains August 1, 1998.

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History

The Neuse River originates northwest of Durham and flows southeasterly for over 200 miles past Raleigh, Smithfield, Goldsboro, Kinston, and New Bern to the tidal waters of the Pamlico Sound. It encompasses 6,192 square miles in 19 counties.

Water quality has been an issue in the Neuse River Basin for over a century. In 1887, legislation was passed to "prevent the throwing of dead stock into the waters of the Neuse River and its tributaries." The State Stream Sanitation Act of 1951 required a statewide survey of all surface waters. As a result of this legislation, the state completed the Neuse River Basin Survey Report in 1959. The most notable findings were the poor quality of waters downstream of point dischargers. Coliform bacteria measurements of millions of organisms per 100 milliliters were not uncommon. The average dissolved oxygen concentration at the Neuse River downstream of Walnut Creek was as low as 3.7 milligrams per liter. Over 260 sites were sampled during 1955 and 1956 and a large number of these were unacceptable by today's standards.

Water quality improved with better regulations and technology for wastewater treatment and stream classifications with accompanying water quality standards. However, eutrophication became a major concern during the 1970s. The prevalence of algal blooms prompted a special investigation of the Neuse River between 1979 and 1981. Division of Water Quality (DWQ) and university researchers worked to determine the extent of the problem, the limiting factors for phytoplankton growth and appropriate management actions. Considering these studies, DWQ concluded that preventing eutrophication in the freshwater portion of the Neuse River depends on reducing phosphorus and nitrogen. Concurrent work by Dr. Hans Paerl and other university researchers with support from the Water Resources Research Institute led to similar conclusions.

In 1983, the Environmental Management Commission (EMC) classified the Falls Lake watershed as Nutrient Sensitive Waters (NSW). As a result of this reclassification, all new and expanding facilities in the Falls Lake watershed received effluent limits of 2 mg/l total phosphorus and existing facilities (with design flow of 0.05 MGD or greater) were given until January 1, 1990 to comply with the 2 mg/l total phosphorus effluent limitation. In 1988, the EMC classified the entire Neuse River Basin as NSW. As a part of the new classification, point source discharges with flows greater than 0.5 MGD and all new facilities were given total phosphorus limit of 2 milligrams per liter. Facilities were also put on notice that more stringent controls may be required in the future. In addition to these actions, a statewide phosphate detergent ban was adopted in January 1, 1988. DWQ specified that nitrogen loading from nonpoint sources (NPS) should be controlled through the Agricultural Cost Share Program.

In 1993, DWQ completed the first Basinwide Management Plan for the Neuse River Basin. This management plan recognized the reductions in total phosphorus loading that had been achieved as a result of the phosphate detergent ban and the improvements in

wastewater treatment. However, the plan recommended an accelerated schedule for reducing nitrogen runoff from nonpoint sources. Since 1993, DWQ has continued to monitor and evaluate conditions in the Neuse River.

During July, September, and October 1995, extensive fish kills occurred in the Neuse River, primarily from New Bern to Minnesott Beach. Millions of menhaden, as well as numerous flounder, croaker and rock fish were killed. DWQ collected copious water quality samples in the areas of the fish kills. The samples showed that the water was hypoxic (lacking oxygen) only 1 to 2 meters below the surface. The results also showed a prevalence of algal blooms. Unusual meteorological conditions in 1995 were partly responsible for the fish kills. During June, record rainfalls delivered a tremendous load of nonpoint source nutrients into the Neuse River.

Environmental conditions in the Neuse River are driven by complex interactions between rainfall, flows, temperatures, biological factors, and chemistry. Each year will bring its own variations. However, the long history of problems with nutrient pollution and algal blooms provides solid evidence that immediate control measures are necessary.

On February 8, 1996, the EMC approved a draft conceptual Neuse River NSW strategy with alternative language for various components of the strategy to be taken to workshops for further discussion with the public. A total of six public workshops were held in May 1996, three in New Bern and three in Smithfield. This proposed draft strategy included voluntary actions by various agencies to reduce nutrients and proposed rule language for mandatory measures for point and nonpoint sources. Some initial changes were incorporated into the proposed rules as a result of comments received at the workshops and written comments.

In accordance with North Carolina general statutes, four public hearings were held in November, 1996. The public hearings were originally scheduled for September, 1996, but were postponed due to Hurricane Fran. The four public hearings were held November 12, 14, 19, and 21, 1996 in Raleigh, New Bern, Goldsboro, and Kinston, respectively. The strategy DWQ took to the public hearings included point source requirements, an illegal discharge program requirement, two buffer requirement/agricultural best management practice options, two urban stormwater options, and two nutrient management requirement options. The hearing officers were members of the EMC and included Robert Epting, Dennis Loflin, Jeffrey Morse, Charles Peterson and Lawrence Zucchino. Nine hundred and sixteen people attended the public hearings, and 201 persons among them made comments at the hearings. The number of attendees and speakers at each hearing is summarized in Table 1 below.

In addition to the speakers' comments, DWQ received over 300 written comments on the proposed strategy. The goal of the proposed Neuse River NSW Strategy, improving the water quality of the Neuse River estuary by reducing nitrogen pollution, received overwhelming support from local governments, various federal, state and local agencies, industries, and citizens' groups during the nine-month public comment period which formally ended on December 16, 1996. All involved parties realize that we all

collectively share responsibility for water quality problems in the Neuse River basin. As for how we achieve our mutual goal of a healthy Neuse River, there remain substantial differences of opinion.

Table 1. Summary of Number of Attendees and Speakers at the Public Hearings

Location	Attendees	Speakers
Raleigh	215	39
New Bern	346	69
Goldsboro	168	42
Kinston	187	51
Total	916	201

Various documents related to the Neuse River NSW Strategy were produced by DWQ in order to share information with the public related to the proposed strategy:

1) Executive Summary of the Concept Paper on the Draft Plan- a nine page summary of the proposed rules.
2) Concept Paper on the Draft Plan- a comprehensive discussion of the proposed rules and overall strategy. Includes a full copy of the proposed rules. (Approx. 260 pages)
3) General Summary of the Draft Plan- a descriptive summary of the proposed rules. Includes a full copy of the proposed rules. (Approx. 100 pages)
4) Executive Summary of the Draft Fiscal Analysis- a 36-page summary of the estimated fiscal impact.
5) Draft Fiscal Analysis- a comprehensive discussion of the estimated fiscal impacts of the proposed rules to local governments, other affected parties and the implementing agencies. (Approx. 300 pages)
6) Accountability Issues- a description of the process that will be used to estimate and measure the progress towards nutrient reduction goals. (Approx. 45 pages)
7) Subject Notice Comments- a summary of verbal comments received at the public workshops held in May 1996 and a copy of written comments received. (Approx. 120 pages)

Recommendation

The rules proposed herein pertaining to the Neuse River Nutrient Sensitive Waters Management Strategy have been developed on the basis of the Hearing Officers' review and analysis of public input from concerned citizens, interested groups and organizations, as well as further staff analysis and discussions among the Hearing Officers. It is the recommendation of the Hearing Officers that these rules, as proposed herein, be approved by the full Environmental Management Commission. Furthermore, the Hearing Officers have determined that the rules being proposed herein may be considered to differ substantially (in accordance with Section 150B-21.2(g) of the Administrative Procedure Act) from the originally proposed rules. These rules, therefore, will have to be re-noticed

and public comment received for a period of 60 days following publication of the final notice. The Commission will then need to reconsider these rules (and any revisions that may be proposed based on the final comments received) following the final comment period. It is further recommended, therefore that the Commission approve re-noticing these rules, in accordance with the requirements of the Administrative Procedure Act, to allow for final public review and comment prior to final adoption of the rules. In making these recommendations, the Hearing Officers have considered the requirements pursuant to 1995 (Reg. Sess., 1996) NC Session Laws, c. 572 and NC General Statutes 143-214.1, 143-214.7, and 143-215.

Summary of Major Comments and Staff Responses

Comments received by DWQ on the proposed Neuse River Basin NSW Management Strategy during the nine-month public comment period were highly variable and voluminous. To avoid printing hundreds of pages of comments in this Report of Proceedings, DWQ has summarized and provided responses to the major comments received. **All comments received are maintained as a component of the public record and are available for review in the DWQ - Planning Branch on the sixth floor of the Archdale Building at 512 N. Salisbury St., Raleigh, NC.**

General Comments

Comment: A 30% reduction of nitrogen is inadequate. In actuality, a much greater reduction may ultimately be necessary.

Response: The 30% nitrogen reduction goal was recommended by a group of scientific experts brought together by the Senate Select Committee on River Water Quality and Fish Kills in January 1996. They agreed that a 30% reduction in nitrogen loading would be a reasonable basis for developing a management strategy with the potential to significantly reduce the frequency and severity of algal blooms and associated low oxygen levels in the estuary. As with all water quality objectives, future monitoring data will be used to periodically reevaluate this reduction goal.

Comment: The EMC should establish a basis for pollution reduction that reflects the cost-effectiveness of each nitrogen reduction technique as well as each geographic source's contribution to the nitrogen problem.

Response: In general, DWQ has designed a nitrogen reduction strategy that provides flexibility to collectively meet the 30% reduction goal through site or region-specific solutions that are market driven and minimize costs. Dischargers and users of urban, residential, and agricultural areas are all presented with multiple options to meet water quality objectives.

Comment: Each community (such as local governments and agriculture) strongly suggests that the proposed strategy imposes a higher expectation and

burden on their community than the others. The proposal should equitably distribute responsibility between point sources and nonpoint sources.

Response: The DWQ has distributed the responsibility for cleaning up the Neuse equitably by:

- Using the best available scientific information,
- Asking point sources and each category of nonpoint sources of nitrogen to reduce their contributions of nitrogen by 30% in order to achieve the overall goal, and
- Concentrating on the most cost-effective measures to control nitrogen.

Comment: Atmospheric deposition of N is a significant contributor to nutrient loading in the Neuse. However, it is the weakest part of the management plan and needs a great deal of research and action planning. Natural background, failing septic tanks, and atmospheric deposition should be included into the nutrient loading calculation.

Response: Some sources of nitrogen in the basin are simply not understood well enough to develop an effective management strategy for them at this time. DWQ has incorporated estimates of background loading into the computations of each category's reduction goal in order to achieve a 30% reduction from the *controllable* nitrogen load. A great deal of research is underway to determine the contributions of nitrogen from the atmosphere and on-site waste systems. Strategies for controlling these sources will be developed as we learn more about their extent and/or effective management.

Comment: Farmers should be given more than two years to implement the BMP requirements. It is unfair to give urban sources more time to implement nitrogen control measures.

Response: The EMC recognizes that the time frames to implement the necessary requirements should be reasonable and equitable. In order to provide adequate time for building and installing BMPs, agriculture has been given five years to implement the requirements in the revised proposal (the same time frame given to all other categories).

Comment: DWQ has overestimated the load from agriculture.

Response: The measured average load of nitrogen arriving at New Bern is 8.7 million pounds per year. Based on discharge permit information, approximately 2.1 million pounds of the nitrogen discharged by point sources is delivered to the Neuse River at New Bern. This means that the remaining 6.6 million pounds of the total load is due to nonpoint sources of pollution and natural background levels of nitrogen. To estimate where the remaining nitrogen is coming from, two basic types of information have been used: 1) the acres of land in the basin which are in agriculture, urban areas, forest, and open water, and 2) the typical amount of nitrogen that is lost from these different land uses based on 113 scientific research studies. Using this information and some estimates of how much nitrogen is

deposited from the air, the best scientific estimate available thus far indicates that agriculture is responsible for approximately 69% of the nonpoint source nitrogen load above background levels. Updated information on land use and nitrogen loading in the basin has been analyzed and more accurate estimates of loading from agriculture, urban areas, and natural background levels of nitrogen have been developed in cooperation with scientists in NC.

Comment: The agricultural community urges the EMC to adopt a plan based on voluntary measures for agriculture. The EMC should give various voluntary measures more time to work before implementing this mandatory measures. Also, the EMC should give the .0200 rules and SB1217 time to take effect.

Response: Water quality problems in the Neuse River Basin are caused by both point source and nonpoint source pollution. NPS controls, whether voluntary or mandatory, are necessary since point source discharge could be completely eliminated and we still would not achieve the 30% nitrogen reduction goal established by the General Assembly. The new regulations for animal operations address only one category of the nonpoint source nitrogen load. Given that voluntary measures for other types of agricultural activities have been in place since the early 1980s, and the Neuse River continues to experience severe water quality problems, a combination of targeted voluntary and mandatory BMPs is the key to improving water quality in the Neuse River Basin.

Comment: While the EMC is proposing a complex set of new regulation, it seems that no consideration has been given to the monitoring and enforcement of the land use, stormwater management and buffer requirements. Expecting voluntary compliance or that the existing Division of Water Quality staff can enforce these requirement without additional resources is unrealistic. The rules should be revised to make stream buffer requirements simple and more understandable, direct, and easy to administer.

Response: DWQ has proposed requirements for stormwater and protection of existing riparian areas that may be readily integrated with existing local government and state programs in manner that maximizes the use of existing resources. Enforcement and monitoring can be accomplished through local ordinances, development design review, sediment and erosion control planning, remote sensing and geographic information systems, and other ongoing efforts. The proposal for protecting existing riparian areas has been modified to make the administration and implementation of those requirements more straightforward.

Comment: The "one size fits all" regulatory approach is not appropriate for the entire Neuse River Basin. The strategy must incorporate maximum flexibility regarding best management practices for agriculture, and other nonpoint sources, and point sources.

Response: DWQ is working toward creating an approach that provides site-specific options for all affected parties. Coalition approaches and options for local implementation proposed for both agricultural and urban areas will provide landowners and local governments with the ability to tailor nitrogen reduction strategies to their unique situations.

Buffers and Agricultural BMPs

Comment: Consideration should be given to compensate landowners for any loss of their property where riparian buffers are mandated.

Response: The NSW strategy does not mandate the re-establishment of buffers where they have been removed. Both urban and agricultural landowners have been provided with flexibility to select the measures that are most effective for nitrogen control on their property. The strategy now calls for the protection of existing riparian forests and there are a variety of mechanisms for providing landowner compensation. These include the NC Conservation Tax Credit Program, the NC Wetland Restoration Program, USDA Farm Bill Programs, and credits for the urban stormwater treatment provided by riparian areas that reduce the need for expensive structural BMPs, such as wet detention ponds.

Comment: Blue line streams on the US Geological Survey (USGS) maps should not be the basis of the buffer requirement. USGS maps are outdated.

Response: Many landowners have expressed concern that the maps being used to identify streams and canals are inaccurate, outdated, and inconsistent. The use of these maps is being proposed for three primary reasons. Although these maps have their faults, they are the best picture we have of streams and other waterbodies in the watershed. Everyone has access to these maps through their local government and local agricultural agencies. If the maps are not used, then almost every site would need a site visit and a site-specific plan to determine where existing buffers need to be maintained. The agencies that would prepare these plans currently do not have the resources necessary to accomplish this.

Comment: How are "hoe drains" handled in the buffer requirements?

Response: Both the rule for protection and maintenance of existing buffers and the rule for agricultural nitrogen reduction exempts hoe drains from the buffer requirement. In addition, within the standard BMP option section of the agricultural nitrogen reduction rule, when determining whether a stream is exempt from the buffer requirement (because it does not receive drainage waters from tributary ditches, canals or streams), a hoe drain does not count as a tributary ditch.

Comment: Riparian buffers do not work in some agricultural situations. Alternative BMPs such as no-till farming, conservation tillage, and cover crops, should also receive credit like nutrient management and water control structures.

Response: DWQ and researchers are developing more options for landowners to control nitrogen on a site-specific basis. When the proposed Basin Oversight Committee and County Advisory Committees are established,

they will provide technical assistance and review site-specific plans which achieve the necessary nitrogen reduction on agricultural land by selecting the practices that are most appropriate for those individual sites. Unlike the variety of proven erosion control practices available to landowners, there are only a few BMPs that are proven to be cost-effective for the control of nitrogen on cropland.

Comment: The management strategy needs to foster the protection and proper management of existing forested buffers and wetlands.

Response: The proposed rules that have been developed for protecting and maintaining existing riparian areas address this important water quality protection goal through enforceable requirements. DWQ will continue to work with the Sedimentation and Erosion Control Commission, the Division of Land Resources, the Division of Forest Resources, and local governments to improve protection for existing riparian areas and integrate programs in an effective manner.

Comment: The proposed buffer requirement needs to be consistent with existing rules and regulations. The proposed buffer requirement exceeds current low density water supply watershed requirements for a 30-ft vegetated buffer on all perennial streams with none required for intermittent streams.

Response: Water supply watershed requirements were designed as a risk-based strategy for protecting water supplies and do not offer the level of nitrogen reduction needed to protect water quality to the Neuse River and its tributaries. A great deal of scientific information has accumulated since the establishment of water supply watershed requirements. Based on the best available scientific information, a 50-ft protected area of forest and grass has been recommended by several experts as the minimum protection needed for control of surface and subsurface nitrogen and protection of aquatic life. The vast majority of nutrients entering the streams of the Neuse enter through small headwater streams. Approximately 1/2 to 2/3 of all stream miles in the Neuse basin are intermittent or small streams with no tributaries. In order to prevent nutrient entry in surface waters at the source, it is imperative that these smaller tributaries be protected.

Comment: An exemption to the rules should be allowed for vegetated buffers required under other programs and permits.

Response: DWQ anticipates working with other agencies that administer vegetated buffer requirements, such as the Division of Land Quality for mining activities, to develop Memorandum of Understanding (MOU) related to the buffer requirements. The MOU would include language to allow satisfaction of the Neuse NSW buffer requirements as part of the agencies' existing plan or permit review process.

Wastewater Discharges

Comment: Some commentors supported the prohibition on new dischargers less than 0.5 MGD while others did not support it since they believed the prohibition would promote septic tanks and urban sprawl.

Response: The draft rules have been modified to allow new dischargers into the basin. However, new dischargers if not established to resolve water quality problems from existing failing subsurface systems, will have to purchase a portion of the point source allocation from other point sources or from the nonpoint source allocation to ensure that the reduction goal is met (offset payments to be made at a rate of 200% of the cost of implementing practices to reduce nonpoint source loadings). Additionally, the proposed facility will have to document that discharge is the only feasible disposal option and will be required to install nutrient removal technology to meet an annual mass load based on a concentration of 3.5 mg/l of total nitrogen.

Comment: Some commentors supported the nutrient trading approach while others thought that it should not be allowed because the Neuse River estuary is too impaired.

Response: The option for point sources to form a coalition, meet their nutrient reduction goals and make payments for nonpoint source controls in years they do not meet their reduction requirement remains in the rules. This approach should still result in the 30% reduction in total nitrogen load to the estuary as the point sources payments would purchase nonpoint source controls above and beyond the 30% nutrient reduction required of the nonpoint source groups.

Some commentors also felt that point sources have historically had many controls placed on them and have been required to spend significant dollars to meet pollutant reduction requirements where nonpoint sources have had few mandatory controls placed on them. The coalition approach included in the NSW strategy allows the point sources to pool their resources and reduce their nutrient loads in the most cost-effective manner.

Comment: Some commentors supported the nutrient trading approach, but they felt that nutrient fate and transport should be incorporated into the coalition trading approach. Other commentors supported trading, but they felt that dischargers above Falls Dam should be allowed to trade as well.

Response: In the short run, all reductions could potentially take place at dischargers in the upper watershed, thereby resulting in the 30% reduction not being realized at the estuary even though it would have been accomplished at the "end of pipe." To address this issue, the rules were modified to require any coalition of dischargers that is set up to demonstrate that reductions

will occur at dischargers located in the counties which border the Neuse estuary if any become members of the coalition.

Dischargers above Falls Dam should also be allowed to trade. However, Falls Lake serves as a major nutrient trap, resulting in only a small percentage of nutrients discharged into the Falls Lake watershed actually being transported to the estuary. Therefore, while the modified rules allow dischargers above Falls Dam to join an association of dischargers, it was assumed that only 15% of the nutrients discharged in the Falls Lake watershed will actually be transported to the estuary. This assumption is built into the rule which defines how an association TN loading target is calculated which may potentially include dischargers above and below the dam.

Comment: Many commentors indicated that 6 mg/l does not achieve the 30% reduction goal for point sources. Others stated that the point source limits should be expressed as mass rather than concentration.

Response: Requiring dischargers to meet 6 mg/l would reduce TN loading in the short run. Facilities in the basin currently discharge roughly 60% of their permitted flow. As municipalities in the basin grow and approach their permitted capacities, the 6 mg/l concentration limit would not achieve the 30% reduction goal for point sources. Therefore, the rule assigns annual mass-based limits to dischargers in the basin based on 3.5 mg/l TN concentration and their permitted flows as of December 31, 1995. Establishing the TN limits in this fashion will achieve the 30% reduction for point sources in both the short and long-term time frames.

Comment: Instead of limiting TN at 6 mg/l for dischargers that do not join an Association, why not just require each discharger to meet a 30% load reduction?

Response: If every facility in the Neuse River Basin reduced its load by 30%, the point source goal would be met. However, the equity of this strategy must be examined. Existing municipal/domestic facilities in the Neuse River Basin currently treat total nitrogen to levels ranging from approximately 6 mg/l to 30 mg/l. If each facility was required to reduce its load by 30%, those that have voluntarily reduced their nitrogen load would by unjustly penalized while those that have done nothing may be able to meet their nitrogen loads by simply changing their plant operation. Therefore, the loading allocation for dischargers that do not join an association was based upon the assumption that no association existed, in order to equitably establish an across the board load allocation based on total permitted flows.

Comment: Will the proposed nutrient limits cause us to shift from one environmental problem to another by increasing the amount of sludge produced at WWTPs?

Response: The proposed strategy requires existing facilities to retrofit their WWTPs for total nitrogen reduction only. Treatment of total nitrogen typically does not result in large increases in sludge production. More stringent phosphorus limits have been proposed for new and expanding facilities in the basin. Since few dischargers will be affected, large amounts of additional sludge should not be produced. In the Falls Lake watershed, reducing phosphorus will provide additional levels of protection to the lake, and as nitrogen controls are implemented in the entire watershed, phosphorus will play a more important role in managing the estuary.

Comment: The nutrient offset payments an Association would have to pay in years it does not meet its nitrogen targets should go to point sources.

Response: Paying money back to the Association for point source controls would merely extend the period of time it will take to achieve the point source 30% reduction goal. The purpose of an association is to allow the association to manage its collective resources to achieve the most cost effective reductions which could be accomplished through upgrading facilities (some or all), purchasing allocation through trading, and any combination that would accomplish the 30% reduction of their load to the system. However, members of an association should be able to make offset payments to reduce stormwater loadings from the urbanized areas above the 30% reduction that other sections of the rule require. Therefore, the rule has been modified to allow an association to make payments to the Wetlands Restoration Fund that will be used to restore riparian areas along surface waters in the basin or into the agriculture cost share program that will be targeted to agricultural BMPs that will reduce nitrogen in the basin. The wetlands offset payments could be targeted to address nutrient reductions from urbanized areas.

Illegal Discharges

Comment: The illegal discharge program should be more stringent.

Response: The illegal discharges program will be a component of the requirements for existing developed areas. Although an illegal discharge program provides a means to remove a wide range of pollutants from existing developments, information from cities that currently are implementing illegal discharge programs shows that most illegal discharges do not contain high levels of nitrogen. Therefore, the affected local governments will be allowed some flexibility to decide how stringent their illegal discharges program will be.

Comment: Existing state and local laws should be utilized to correct illegal dischargers.

Response: The Neuse local stormwater programs will allow and encourage local governments to utilize existing regulations to correct illegal discharges.

Comment: Does the cost of implementing these illegal discharge requirements justify the small potential nutrient reduction benefits that would occur?

Response: Since the local governments will have input into how stringent their illegal discharges program will be, they can assist in determining what type of program will be cost-effective.

Stormwater Management

Comment: The 12% impervious area limit in the proposed low-density option is more stringent that the 24% currently permitted in water supply watershed protected areas.

Response: The stormwater program has been revised so that it no longer includes a differentiation between high density and low density developments. Instead, the largest local governments in the basin would be required to implement a stormwater management program for both new and existing developments. For new developments, developers would be required to attain a design standard for reducing nitrogen loading for every new development disturbing an area greater than one acre. Developers would be given a range of options for meeting the design standard, including planning and other best management practices, as well as the option of partially offsetting their nitrogen contribution through payments to available funding sources.

Comment: Fertilizer used to melt ice in urban areas is not addressed.

Response: Since this use of fertilizer would be difficult to regulate and may represent a small portion of the nitrogen loss in the basin, DWQ encourages educational programs through the Neuse local stormwater programs to teach citizens how to improve management of fertilizer and other sources of nitrogen.

Comment: There should be more detail given for what is required in the local stormwater plans.

Response: The local stormwater management programs would be tailored to reduce nitrogen loading from existing development through programs such as public education about fertilizer usage, an illegal discharge program to identify potential illegal sources of nitrogen to the storm sewer and identification of areas suitable for stormwater retrofits that could be funded through various sources. In addition, the local stormwater program would require stormwater management on new developments to meet a maximum nitrogen loading of 3.6 pounds/acre/year. Some of the measures to assist in meeting this design standard would include, but not be limited to, protecting existing stream buffers, reducing the impervious areas connected directly to streams by storm sewer and routing runoff through natural areas to the maximum extent practical. It was the intent of the rule to allow local governments some latitude to create a program that meets the goals and is tailored to their local needs.

Comment: The stormwater rules should allow a multiple local government association approach as an alternative to on-site stormwater retention.

Response: DWQ allows and encourages the affected local governments to form an association for developing a local stormwater management program.

Comment: Public infrastructure projects should be exempt from the on-site stormwater provisions.

Response: Since each source of nitrogen is being asked to reduce its load by 30%, it would not be fair to exempt public infrastructure projects.

Comment: DWQ should specify development designs to limit nitrogen losses and those losses should be quantified in the tracking data. Will the stormwater program include BMPs for nitrogen reduction, retrofits in existing areas, or buffers?

Response: DWQ will provide a design manual that will describe appropriate planning, buffer designs, and other best management practices for nitrogen reduction. Depending on the decisions of the affected local governments, the stormwater program may include stormwater retrofits in existing urban areas. The local governments required to adopt a Neuse local stormwater program will be required to quantify and track changes in net nitrogen loading on an annual basis. Also, offset payments made into the Wetland Restoration Fund may be used for retrofitting existing urban areas with riparian areas.

Comment: What if local ordinances are sufficient to insure that water quality is preserved and enhanced, without any additional restrictions on development?

Response: If an affected local government can show it has in place an existing stormwater program that meets the goal of reducing nitrogen from both existing and new developments by 30%, then the program will be acceptable for meeting the requirements of this rule.

Comment: The stormwater program should be amended so that municipalities with populations greater than 100,000 and an approved NPDES permit for stormwater are exempt from having to develop and implement a local stormwater program.

Response: If an affected local government with an approved NPDES stormwater permit can show that its existing program meets the goal of reducing nitrogen from both existing and new developments by 30%, then this program will be acceptable for meeting the requirements of this rule.

Comment: There should be an urban trust fund to install best management practices to reduce nitrogen levels in stormwater.

Response: While this is an excellent idea, there currently does not exist a mechanism for distributing and overseeing such funds. However, developers will have the option to partially offset the nitrogen load from new developments by

making offset payments to the Wetland Restoration Fund, some of which may be used to fund restoration of urban riparian areas.

Nutrient Management

Comment: The nutrient management requirement should apply to both agricultural and urban areas including golf courses.

Response: The revised proposal applies to cropland, recreational land including golf courses, right-of-ways, and residential / commercial / industrial areas.

Comment: Farmers are already doing nutrient management. The nutrient management requirement is unnecessary, since it would only create extra work load for farmers.

Response: Nutrient management has been proven to be a very cost-effective best management practice. DWQ recognizes that farmers are practicing varying degrees of nutrient management. However, the majority of farmers still over-apply nitrogen to their crops. This is partly the result of not using realistic yield expectations and, instead, using inaccurate recommendations. To address this issue, DWQ will try to make education the centerpiece of the nutrient management requirement. DWQ will encourage all affected parties to attend a nutrient management training course conducted by the NC Cooperative Extension Service.

Comment: The thresholds for determining who is required to do nutrient management should be equitable for agricultural and non-agricultural situations.

Response: The nutrient management requirement has been revised so that it no longer includes differing thresholds for agricultural and non-agricultural lands. Under the revised nutrient management requirement, any person applying to a total area larger than 50 acres per year of agricultural lands, recreational lands, right-of-ways, or lawns and gardens is subject to the nutrient management requirement.

Summary of the Proposed Rules

Overall Reduction Goal

Pursuant to 1995 (Reg. Sess., 1996) N.C. Session Laws, c. 572, the Environmental Management Commission establishes the goal of reducing the average annual load of nitrogen delivered to the Neuse River Estuary from point and nonpoint sources by a minimum of 30 percent of the average annual load for the period 1991 through 1995 by the year 2001. All waters of the Neuse River Basin have been supplementally classified as Nutrient Sensitive Waters (NSW) pursuant to 15A NCAC 2B .0223. The following procedures are to be implemented in accordance with 15A NCAC 2B .0223 in all waters of the Neuse River Basin:

- Protection and maintenance of existing forested riparian areas,
- Wastewater discharge requirements
- Urban stormwater management
- Agricultural nitrogen reduction goal
- Agricultural nitrogen reduction practices
- Nutrient management
- Nitrogen offset fees

Protection and Maintenance of Existing Riparian Areas

This rule would require that **existing** riparian (streamside) areas be protected and maintained on both sides of intermittent and perennial surface waters. **It would not establish new buffers.** A total of 50 feet of riparian area would be required on each side of certain waterbodies in the basin. This 50 foot riparian area would consist of 30 feet of virtually undisturbed forest and 20 feet of grassed/ vegetated area or trees that could be harvested. In the basin's larger urban areas, protection of existing riparian areas would be a component of the urban stormwater programs discussed below.

Wastewater Discharges

The purpose of the Wastewater Discharge Management Strategy for the Neuse River Basin is to set in place equitable rules that will mandate a cumulative 30 percent reduction in point source total nitrogen loading to the Neuse River Estuary. The strategy provides for several management options from which dischargers may select how they comply with the proposed rules. This allows for flexibility in approach while maintaining firm commitment to the 30 percent total nitrogen reduction goal. The details of the strategy are outlined below.

Optimization Of Existing Facilities

The strategy requires that all large dischargers (> 0.5 MGD) in the Neuse River Basin optimize their existing facilities for nitrogen removal. Each facility or group of facilities subject to this rule will have one year to report to the Division on efforts to reduce nitrogen and document nitrogen reduction results. This effort will help ensure that dischargers take advantage of existing capabilities for nitrogen removal.

Permitting Of New Discharge Of Wastewater

No new discharge of wastewater to the Neuse Basin will be permitted unless each of the three following conditions are meet: 1) there is no alternative for discharge, 2) facilities are designed to meet advanced nutrient removal limits (annual mass limit based on 3.5 mg/l concentration times permitted flow), AND 3) the discharger obtains sufficient total nitrogen load allocation from other point sources or nonpoint sources to offset the increase in load that is to be permitted to the new facility. New dischargers will also be required to meet a monthly total phosphorus limit of 1 mg/l. These rules are intended to strongly discourage any new discharge of wastewater to the Neuse Basin and, for any new facilities that are permitted, to ensure there is no net increase in total nitrogen load.

New municipal wastewater dischargers that develop a treatment plant to replace existing failing subsurface systems shall also be subject to the requirements listed above. However, they may obtain allocation from nonpoint sources at a rate of 110 percent of the cost on nonpoint source control (as set forth in 15A NCAC 2B .0240 of this rule), while all any other new discharger could only obtain nonpoint source allocation at a rate of 200 percent of cost. This is intended to address removal of nitrogen from failing subsurface treatment systems without undue cost and still ensure that there is no net increase in total nitrogen load.

Facilities That Expand To Accept Flow From Other Facilities

Because the 30 percent nitrogen reduction goal is a collective target, dischargers that take the wastewater from another discharger, allowing for the removal of that discharge from the Neuse Basin, will be given full allocation credit for any facilities taken off line. For example, if one permitted facility accepts the full wastestream from another permitted facility with a 1000 pound per year allocation and that facility's permit is rescinded, the facility accepting the waste would increase its allocation by 1000 pounds per year. This is intended to allow for the consolidation of wastestreams to a smaller number of facilities, thereby increasing the potential efficiency of waste treatment.

Facilities May Meet Limits Collectively

With approval by the EMC, facilities may join together to meet a 30 percent nitrogen reduction collectively. Within five years, such an association would have a nitrogen target of 30 percent less than their collective 1995 annual nitrogen load. For any year the target is not meet, the association would be required to make payments for nonpoint

source controls to offset the nitrogen load surplus. Calculations are included in the rule to ensure that the effect of nitrogen loss in Falls Lake will not limit the effectiveness of a coalition to meet the 30 percent reduction at the estuary. Likewise, such an association would be required to document nitrogen reduction from any members located in the lowest four counties in the basin adjacent to the estuary, ensuring that nitrogen loss during transport does not limit effectiveness of the strategy at the estuary.

Association members would also be required to meet quarterly average phosphorus limits of 2 mg/l (as per the current Neuse River Nutrient Sensitive Waters Strategy).

Existing Facilities Not In An Association

All existing dischargers below Falls Lake greater than 0.5 MGD would be required to meet an annual mass total nitrogen load based on 3.5 mg/l concentration times their 1995 permitted flow. This calculation of nitrogen represents the total mass that may be discharged by all existing dischargers and still meet the 30 percent reduction goal at the estuary. Expansion of flow with an increase in nitrogen loading would only be permitted under conditions and requirements similar to those for new facilities (see earlier discussion).

For phosphorous, existing facilities would be required to continue to meet a 2 mg/l quarterly average limit as per the existing Neuse River Nutrient Sensitive Waters Strategy. Upon expansion, nonassociation facilities would be required to meet a monthly average phosphorus limit of 1 mg/l.

Urban Stormwater Requirements

The basinwide stormwater program requires that 10 cities and 5 counties (Cary, Durham, Garner, Goldsboro, Havelock, Kinston, New Bern, Raleigh, Smithfield, Wilson, Durham County, Johnston County, Orange County, Wake County, and Wayne County) develop a stormwater management plan to address nutrients. The stormwater management plan requires these local governments to review and approve stormwater management plans for new development, implement a public education program, identify and remove illegal discharges to the storm sewer system, identify suitable locations for installing stormwater management practices in areas of existing development, and provide annual nitrogen load reporting.

New development is required to maintain a nitrogen loading of 70% or less of the 1995 loading and provide no net increase in the pre-development peak flow from the 1-yr. 24-hr. storm. New development must meet a minimum design level for nutrient removal, but may partially offset nitrogen loading by paying into the Wetland Restoration Fund. To establish a design standard for new development within the context of a 30% net reduction goal, DWQ assumed that new development would occur on existing agricultural and forest lands. An area-weighted loading rate of 5.1 lbs/ac/yr was computed for agricultural and forest lands taken collectively in the Neuse River Basin

above New Bern. New development would meet the 30% reduction goal by maintaining a loading rate of 3.6 lbs/ac/yr (30% of the existing composite load of 5.1 lbs/ac/yr from developable areas).

The DWQ will have one year from the effective date of the rules to provide a model stormwater management plan addressing all of the components listed above. Local governments will then have six months to submit a local stormwater management plan based upon the DWQ model. All of the subject local governments must have a stormwater management program in place within 2 years of the effective date of the rules. If a local government fails to adequately establish its stormwater management program, then the DWQ will issue a NPDES stormwater permit to implement the stormwater program for that local government.

Agricultural Reduction Goal

To be effective in cleaning up the Neuse River, it is necessary to identify the sources and relative quantities of pollution using the best available scientific information. It is possible to directly measure some types of pollution like discharges of nitrogen from wastewater plants and industrial facilities. It is also possible to directly measure the amount of nitrogen that arrives to the Neuse River estuary at New Bern. The measured average load of nitrogen arriving at New Bern is 8.7 million pounds per year. Based on the best available scientific information, approximately 2.1 million pounds of the nitrogen discharged by point sources is delivered to the Neuse River at New Bern. This means that the remaining 6.6 million pounds of the total load is due to nonpoint sources of pollution and natural background levels of nitrogen. It also means that if we completely eliminated all point source dischargers from the Neuse Basin, we still would not have reached our reduction goal of 30%.

To estimate where the remaining nitrogen is coming from, two basic types of information have been used: 1) the acres of land in the basin which are in agriculture, urban areas, forest, and open water, and 2) the typical amount of nitrogen that is lost from these different land uses based on 113 scientific studies.

First, land use / land cover information was analyzed in the Neuse Basin using updated 1993-95 infrared satellite imagery. A winter and summer scene was used in the process. Land in the Neuse Basin was classified based on 24 land cover types. These 24 land cover types were further aggregated into: Cultivated, Urban, Managed Herbaceous (pastures, golf courses, other turfgrass, etc.), Forest, and Open Water (direct atmospheric input). The 1993-95 land cover does not have municipal areas interpreted yet. DWQ surveyed municipalities with populations greater than 5,000 in the Neuse Basin to determine an estimate of average land use in municipal areas. The survey data were used to divide unclassified municipal areas into three general land use classes: residential, commercial/industrial and undeveloped.

Using the original 1992 export coefficient database developed by Research Triangle Institute, nitrogen export coefficients were developed for each of the five aggregated classes of land cover based on 113 research sites primarily from piedmont and coastal areas in the southeastern and mid-Atlantic United States. Median export coefficient values for each land use / land cover class were used in the analyses. The Open Water nitrogen export coefficient was determined using data available from the National Atmospheric Deposition Program. The nitrogen trapping efficiency of Falls Lake Reservoir was also accounted for in the analysis. Using the refined export coefficients, we determined a total annual source load of nitrogen to the Neuse River above New Bern (Table 2) using the following equation:

*Land cover acres * Annual export coefficient (lbs TN / acre) = Total lbs by land cover*

Table 2. Estimated Total Nitrogen Load by Land Cover for the Neuse Basin above New Bern using Export Coefficients

Land Class	Area (ac)	Total N (lbs)	% Load
Cultivated	850,279	11,533,115	66
Managed Herb.	137,158	599,733	4
Forest	1,932,297	3,332,511	19
Urban	192,407	1,550,044	9
Open Water	36,810	321,911	2
Total	**3,148,951**	**17,337,314**	**100**

Some of the nitrogen in the river is lost as it moves downstream. Many have argued that DWQ and others have taken these losses into account for point sources like wastewater treatment plants, but not for nonpoint sources like agriculture. In fact, this process has been taken into account in both situations. For example, DWQ permits the point source discharge of 3.9 million pounds of nitrogen per year into the Neuse and its tributaries. The best models available suggest that approximately 2.1 million pounds of nitrogen per year (54% of permitted load) are delivered all the way down the river to New Bern. In contrast, there are over 900,000 acres of agricultural land in the Neuse River Basin above New Bern. Based on the results of 44 studies of agricultural runoff in the Piedmont and Coastal Plain, DWQ can estimate the agricultural load by multiplying the typical export of nitrogen per acre and the agricultural land area. This yields a load of almost 12 million pounds of nitrogen per year from agriculture alone. However, less than half of the agricultural load calculated is estimated to arrive at New Bern.

The next step in calculating load reduction responsibilities was to partition the managed herbaceous/pasture (MHP) land cover class among one or more of the other classes. Using North Carolina Department of Agriculture (NCDA) turf grass survey results, DWQ estimated that approximately 1/4 of the total MHP area was comprised of non-agricultural land uses such as golf courses, lawns, and commercial lands. The total nonpoint source load attributed to MHP was approximately 4%. Based on these calculations we split the

MHP load by adding 1/4 of this area to the urban nonpoint source load percent and the remaining 3/4 to the cultivated nonpoint source load percentage thereby creating a general agriculture class. Final nonpoint source load partitions are presented in Table 3. These data were then used to determine the nitrogen load reduction goals by land use based on the overall 30% reduction goal.

Table 3. Nonpoint source nitrogen load partitioning by land use

Land Use Category	Partition of NPS Load at New Bern
Agriculture	69%
Urban	10%
Atmospheric	2%
Background	19%

After the nonpoint source load is partitioned, the final step is to calculate the actual pounds of N each group must eliminate. The calculated nonpoint source nitrogen load is 6.6 million pounds of N per year delivered at New Bern. Nonpoint sources are responsible for reducing 1,980,000 pounds of N based on a 30% reduction of total N. A portion of the N load represents natural "background," or that portion which would be exported from the basin if it were entirely composed of natural forest. The uncontrollable background load was divided between agricultural and urban land uses in proportion to their respective areas in the basin. Table 4 presents the final results of the load reductions needed to achieve a 30% reduction in N loading to the Neuse River at New Bern.

Table 4. Nitrogen reduction goals by category

Land Use	Amount to achieve 30% reduction (lbs. of nitrogen / year delivered at New Bern)
Agriculture	1,695,000
Urban	246,000
Atmospheric	39,000
Total	**1,980,000**

Even though the overall goal of the NSW strategy is to reduce nitrogen loading to the Neuse River estuary, it should be noted that the atmospheric loading goal presented here is for the area of the basin above New Bern, since the reduction will be calculated for nitrogen loading delivered at New Bern. The majority of atmospheric deposition to open water in the Neuse River Basin occurs below New Bern. Atmospheric loading of nitrogen below New Bern may represent a significant source of nitrogen to the estuary. As scientific research progresses on atmospheric transport and deposition of nitrogen, sources such as animal waste, and estuary hydrodynamics, better information will be available to refine the overall strategy for managing atmospheric sources of nitrogen in the Neuse River Basin and its airshed.

Agricultural Best Management Practices for Nitrogen Reduction

The proposed strategy for agricultural nitrogen reduction requires the cumulative load from all agricultural operations, including those related to crops, pasture, livestock and poultry, to achieve a 30% total nitrogen net loading reduction of 1,695,000 pounds per year from the average 1991-95 load to the Neuse River Estuary above New Bern. This net nitrogen loading reduction specified must be achieved collectively by agricultural operations within five years from the effective date of the proposed Rule.

Under the revised proposal, persons engaging in agricultural operations in the Neuse River Basin have **two options** for meeting the nitrogen net loading reduction. The options are to either participate in a county nitrogen reduction plan (see Option 1 below) or implement standard Best Management Practices (see Option 2 below). Both these options are contained in a single proposed rule (15A NCAC 2B .0238).

Option 1: County nitrogen reduction plan option

Overall Approach

All persons engaging in agricultural operations that choose to participate in the county nitrogen reduction plans must complete a sign-up process. This sign-up process would be completed within one year from the effective date of the proposed Rule. If an agricultural operation does not complete the sign-up, then it will be subject to implementation of standard Best Management Practices (Option 2).

This alternative would allow the establishment of local advisory committees comprised of staff from Natural Resources Conservation Service (NRCS), NC Cooperative Extension Service (CES), Division of Soil and Water Conservation (DSWC), NC Department of Agriculture (NCDA), local Soil and Water Conservation Districts (SWCD), and a farmer in each county in the Neuse River Basin with the goal of increased effectiveness and flexibility in administering pollution reduction strategies. Acting with advice from the committee, the DSWC employee on the committee would have the authority to develop, review, and approve site-specific plans for nitrogen. Also, implementation maps/plans could be developed (for example, preclude the use of USGS "blue lines" by determining where buffers, water control structures, and other practices are most appropriate based on specific site characteristics). A central goal would be to integrate the committees with existing agricultural programs and initiatives (for example, Farm Bill EQIP committees/priorities and NC Agricultural Cost Share Program). Landowners in cooperation with the above agencies would develop site-specific plans for controlling nutrients.

Basin Oversight Committee

The Environmental Management Commission will delegate to the Directors of the Division of Water Quality and Division of Soil and Water Conservation the responsibility

of forming a Basin Oversight Committee. The Directors will solicit one nomination for membership on this Committee from each of the following agencies:

- Division of Soil and Water Conservation,
- United States Department of Agriculture- Natural Resources Conservation Service,
- North Carolina Department of Agriculture,
- North Carolina Cooperative Extension Service, and
- Division of Water Quality.

The Directors will also solicit one nomination that represents environmental interests, one from the scientific community, and a farmer.

Nominations for the Basin Oversight Committee will be approved by the Secretary, Department of Environment, Health and Natural Resources. Members will be appointed for a term not to exceed five years and will serve at the pleasure of the Secretary. The Environmental Management Commission will delegate the following responsibilities to qualified employees of the Department who are members of the Basin Oversight Committee and employees of the Division of Water Quality and Division of Soil and Water Conservation. These qualified employees will act with advice from the Basin Oversight Committee to:

- Develop a tracking and accounting methodology for evaluating total nitrogen loading from agricultural operations and progress toward reaching the total nitrogen net loading reduction from the implementation BMPs within the Neuse River Basin above New Bern.
- Submit the accountability process to the Environmental Management Commission for approval within one year after the effective date of the Rule.
- Include methods in the accountability process to accurately track implementation of BMPs, including location and type of BMPs;
- Allocate to counties within the Neuse River Basin above New Bern their portion of the nitrogen loading reduction from agricultural operations, including any division of the reduction between specific categories of agricultural operations. Each county may not have to reduce individually their nitrogen loading by 30%; however, the nitrogen loading reduction from each county should collectively meet the total nitrogen reduction.
- Review, approve, and summarize county nitrogen reduction plans and present these plans to the Environmental Management Commission for approval within two years from the effective date of this Rule.
- Review, approve, and summarize county nitrogen reduction annual reports and present these reports to the Environmental Management Commission each October.

County Advisory Committees

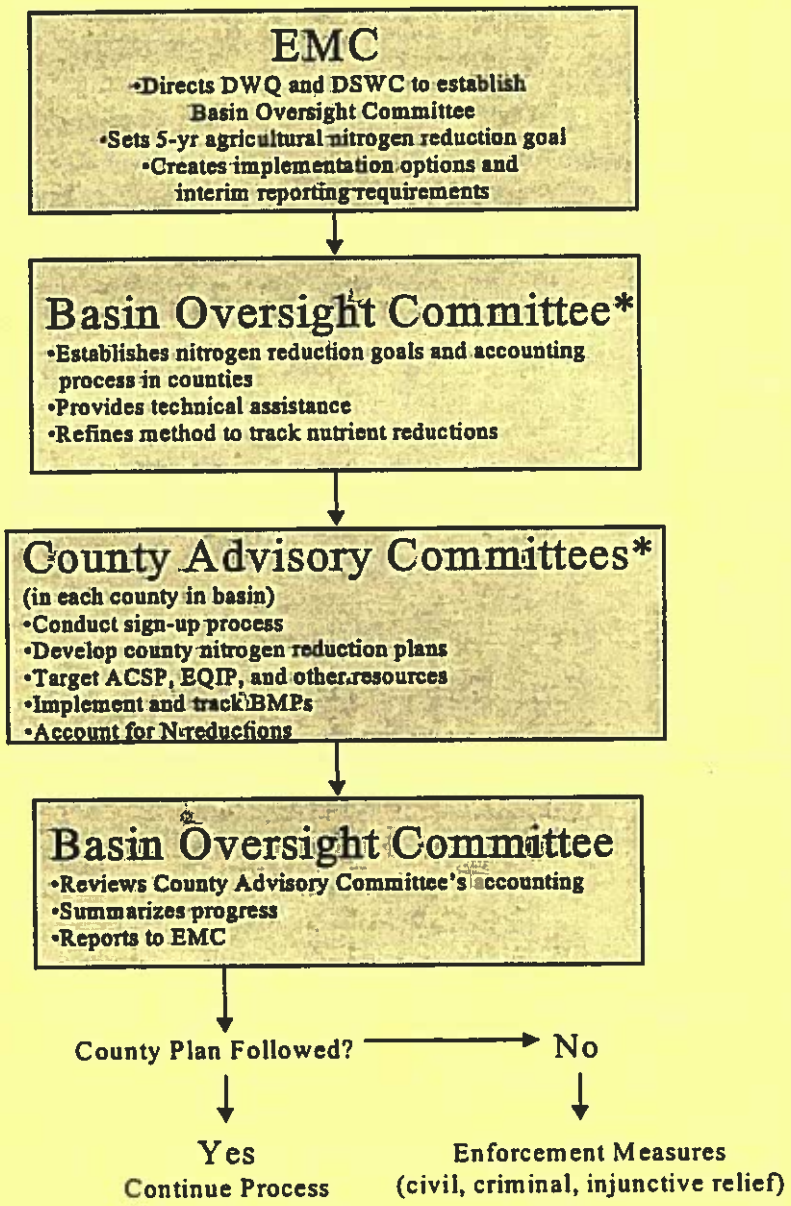
The Environmental Management Commission will also delegate to the Directors of the Division of Water Quality and Division of Soil and Water Conservation the responsibility of forming County Advisory Committees. The Directors will form County Advisory Committees in each county within the Neuse River Basin. The Directors will solicit nominations for membership on the County Advisory Committee to include one local farmer and a representative from each of the following local agencies:

- Soil and Water Conservation District,
- United States Department of Agriculture- Natural Resources Conservation Service,
- North Carolina Department of Agriculture, and
- North Carolina Cooperative Extension Service.

Acting with advice from the County Advisory Committee members, the roles of DSWC employees who are members of the County Advisory Committees include:

- Conducting a sign-up process for persons wishing to participate in and implement the county nitrogen reduction plan;
- Developing county nitrogen reduction plans that collectively meet the nitrogen loading reduction goal for agricultural operations within five years from the effective date of this Rule. A matrix of best management practice options, which account for stream order, floodplain width, and regional variations in soil types and topography, may be used in developing the county nitrogen reduction plans. County nitrogen reduction plans must specify the name and location of participant agricultural farming operations, BMPs which will be required as part of the plan, estimated nitrogen reduction, schedule for BMP implementation, and operation and maintenance requirements; and
- Submitting an annual report to the Basin Oversight Committee each May on net total nitrogen loading reductions from agricultural operations, the implementation of BMPs for nitrogen control, and progress towards the total nitrogen loading reduction requirement above New Bern. The Environmental Management Commission will use the annual reports to determine the need for adjustments to the nitrogen reduction strategy for agricultural operations.

Figure 1. Agricultural Option 1 - Roles and Oversight



* These responsibilities are delegated to qualified employees of the Department, who are members of the Basin Oversight Committee and County Advisory Committees and employees of DWQ and DSWC. These employees carry out the responsibilities with advice from the committees.

Option 2: Standard Best Management Practices

If an agricultural operation does not complete the sign-up process for implementation of the county nitrogen reduction plan, then the agricultural operation must implement specific best management practices within four years following the effective date of the proposed Rule. Failure to meet these requirements may result in enforcement measures.

Table 5 summarizes the agricultural exemptions and modifications to proposed Option 2. Reductions to the required riparian area width will be allowed if either water control structures or nutrient management is used.

Table 5. Summary of standard Best Management Practices (Option 2)

BMP(s) Implemented	**AGRICULTURE (Option 2 only)** **Required Riparian area Zones and Vegetation / Width Options**
Nutrient Management ***and*** Controlled Drainage	**No Riparian Area Requirement**
Nutrient Management ***or*** Controlled Drainage	**20' Forested Riparian Area OR 30' Vegetated Filter Strip**
Loss of Cropland Required for Receipt of Federal Tobacco Allotments (no Nutrient Management or Controlled Drainage)	**20' Forested Riparian Area AND 30' Vegetated Filter Strip**
Neither of the following BMPs: Nutrient Management or Controlled Drainage	**30' Forested Riparian Area AND 20' Vegetated Filter Strip (Zones 1 and 2)**

Under Option 2 (standard BMPs), landowners would not need a riparian area if:

- Their streams, canals or ditches do not show up on the 1:24,000 scale USGS topographic map; or
- Both water control structures (with a water management plan) and a nutrient management plan are in effect; or
- Their ditch is small (including hoe drains and field ditches) where drainage waters first enter the drainage system.

Nutrient Management

Nutrient Management is defined as the development, implementation and periodic maintenance of a plan to apply nutrients at rates necessary to 1) achieve realistic crop yields, 2) improve timing of nutrient applications and 3) increase nutrient use efficiency. Under the proposed Rule, three general categories of nutrient applicators are required to obtain a certificate verifying completion of training in nutrient management within five years of the effective date of the rule. These groups are defined as:

1. Persons who apply fertilizer to 50 or more acres of cropland in a calendar year;
2. Persons who apply fertilizer to 50 or more acres of golf course, recreational lands, right-of-way, or other turfgrass areas in a calendar year; and
3. Persons who commercially apply fertilizer to 50 or more acres of lawn and garden areas in residential, commercial or industrial areas.

The certificate would be given by either the Cooperative Extension Service (CES) or the Division of Water Quality (DWQ). During the first year the rule is in effect, there will be sign-up period administered by DWQ and CES, for those individuals wishing to take nutrient management training.

If, in five years of the rule's effective date, a person(as described above) does not participate in nutrient training and become certified, then they will have to develop a nutrient management plan for lands on which they apply nutrients. Cropland nutrient management plans would have to meet standards and specifications of the USDA-Natural Resources Conservation Service, or those adopted by the NC Soil and Water Conservation Commission(SWCC). These plans may be written by the applicator or by a consultant. However, written approval by a technical specialist designated by the SWCC will be required to certify that the nutrient management plan meets the standards developed by the USDA-NRCS and/or SWCC.

Turfgrass, horticultural and other non-agricultural fertilizer applicators who do not obtain nutrient management training certification in the five year period will have to develop a nutrient management plan that meets nutrient application standards and specifications developed by DWQ in consultation with CES, NRCS, Division of Soil and Water Conservation(DSWC) and the North Carolina Department of Agriculture(NCDA). These standards and specifications will be developed and approved by the Director of DWQ within one year of the rule's effective date. As the case for croplands, these plans may be written by the applicator or by a consultant but must be approved by a technical specialist designated by the SWCC. Approval by a designated technical specialist will certify that the applicator has a nutrient management plan for lands on which they apply fertilizer and that the plan meets the standards set forth by the DWQ.

Operators of poultry operations of 30,000 or more birds utilizing a dry litter waste management system are required to apply waste at agronomic rates for nitrogen based on realistic yield expectations.

Landowners and other individuals who apply fertilizer to less than fifty acres a year including residential, industrial, commercial and crop landowners are encouraged to apply fertilizer at rates recommended by the CES. Also, they are welcome to participate in nutrient management training.

Those persons who choose to develop nutrient management plans instead of participating in the nutrient management training certification program will have to keep nutrient management plans, and supporting documents, on-site or be able to produce them within 24 hours at the request of the DWQ. An applicator, who opts not to undergo nutrient management training, and then does not develop a nutrient management plan or fails to apply nutrients in accordance with an approved nutrient management plan will be in violation of the rule and subject to enforcement procedures.

Offset Fees

Agricultural Best Management Practice Offset Fees

The offset fee for implementing agricultural Best Management Practices in the Neuse River Basin through the North Carolina Agricultural Cost Share Program is equal to that developed for the Tar-Pamlico Nutrient Management Program. The fee of $13 per pound is based on BMP cost-effectiveness research.

Summary of Methodology to Determine the Offset Fee for Nitrogen Removal through Riparian Wetland Restoration

Wetlands are receiving steadily increasing attention for their potential to filter and intercept various pollutants. These wetlands, both natural and constructed, have been advocated as effective, low-cost treatment tools for nonpoint source pollution. The systems examined here only include natural riparian wetlands. It is important to note that various assumptions were made during the analysis. Wetland restoration is assumed to be attempted and successful. Nitrogen removal is the only water quality benefit considered here. The life expectancy of a natural riparian wetland is assumed to be 30 years, since the typical life expectancy of stormwater detection ponds is usually estimated at 20 to 30 years.

There are three primary nitrogen removal benefits achieved by restoring natural riparian wetlands. The first benefit is due to a land use change. The effect of the land use change produces a water quality benefit by converting a nutrient source into a sink. The second benefit is achieved by restoring the processes which filter and intercept nutrients from

adjacent lands. Filtering and intercepting nutrients from upstream runoff due to overbank flooding during storm events are the third benefit.

Effectiveness Related to Land Use Change

Urban or agricultural areas will be converted to riparian wetlands through restoration. To quantify the water quality benefit due to a land use change, a median composite export coefficient for both urban and agriculture land use categories was compared to a wetland export coefficient. The export coefficients used here are taken from a literature review and analysis conducted by the Research Triangle Institute (RTI) and the NC Division of Water Quality (DWQ). The difference is reported here as the effectiveness.

Effectiveness = Composite Urban/Agriculture Export Coefficient (12.98 kg Total N/ha) - Wetland Export Coefficient (1.9 kg Total N/ha) = 11.1 kg Total N / ha/ yr

Effectiveness Related to Lateral Interception (Filtering and Interception of Nitrogen from Adjacent Lands)

Gannon (1997) reviewed a large number of wetland and riparian area studies conducted from 1978 to September 1995. These studies include descriptions of characteristics of wetland and riparian area systems and treatment efficiencies. The ratio of adjacent nitrogen contribution area to wetland treatment area is approximately 10.8 based on over 10 natural wetland studies reviewed by Gannon. The average nitrogen loading from adjacent lands is estimated by multiplying the adjacent nitrogen contribution area (10.8 ha) and a median composite export coefficient for urban and agricultural areas. A 50% nitrogen removal efficiency in natural riparian wetlands is assumed based on various literature (Mitsch, 1994; Moshiri, 1993; and Kadlec, 1995). The effectiveness is calculated by multiplying nitrogen loading and removal efficiency.

Effectiveness = adjacent nitrogen contribution area (10.8 ha) x urban/agriculture composite export coefficient (12.98 kg Total N/ha) x natural wetland nitrogen removal efficiency (50%) = 70.1 kg Total N / ha / yr

Effectiveness Related to Floodwater Cleansing (Filtering and Interception of Nitrogen due to Overbank Flooding)

The other water quality benefit of natural riparian wetlands is filtering and intercepting nitrogen from upstream runoff through overbank flooding. The frequency and duration of flooding is crucial to quantifying this benefit. In this study, the frequency is assumed to be once every year at a depth of 1 ft (0.3 m). The total nitrogen level in the upstream runoff is assumed to be 2.5 mg/L. The effectiveness is estimated by:

*Effectiveness = nitrogen level in the upstream runoff (2.5 x 10^{-6} kg Total N/liter) x area (1 ha) x depth of flooding (0.3 m) x natural wetland nitrogen removal efficiency (50%) x conversion factor (10^{7} liters/ha*m)*
= 3.75 kg Total N / ha / yr

The analysis of overall effectiveness of natural riparian wetland restoration suggests that 2547 kg of total nitrogen will be removed by each restored hectare of natural riparian wetlands over 30 years. Table 6 presents effectiveness data for riparian wetland restoration.

Table 6. The Effectiveness of Riparian Wetland Restoration

Water Quality Benefit	**Annual Effectiveness (kg/ha/yr)**	**Effectiveness in 30 yrs (kg/ha)**
Land use change	11.1	332
Lateral interception	70.1	2103
Floodwater cleansing	3.75	112
Total	**84.9**	**2547**

The cost to restore natural riparian wetland is estimated to be $59,300 / ha from the North Carolina Wetland Restoration Program. The cost effectiveness of natural wetland restoration can be estimated by:

Cost-effectiveness = cost to restore natural riparian wetland ($/ha) / effectiveness of natural riparian wetland restoration (Total N kg/ha)

Table 7 summarizes these parameters and present the estimated cost-effectiveness value.

Table 7. Cost-effectiveness of Natural Riparian Wetland Restoration

Effectiveness	**Cost**	**Cost-Effectiveness**
(total N kg/ha)	($/ha)	($/kg total N)
2547	59300	23

References

Kadlec, Robert H. and Robert L. Knight. 1996. *Treatment wetlands*. Lewis Publishers. Boca Raton, FL.

Gannon, Richard. 1997. Effectiveness of wetland riparian areas for treatment of agricultural pollution sources: A literature review. (In Draft)

Mitsch, William J. (ed.) 1994. *Global Wetlands: Old World and New*. Elsevier. New York.

Moshiri, Gerald A. (ed.) 1993. *Constructed Wetlands for Water Quality Improvement*. Lewis Publishers. Boca Raton, FL.

Copies of the Proposed Rules

A copy of the full text of each proposed rule for the Neuse River Basin NSW Strategy follows:

15A NCAC 2B .0202 is proposed for modification as follows:

The following definitions are proposed to be added to existing definitions in 15A NCAC 2B .0202.

.0202 DEFINITIONS

(1) 'Applicator' means any person, firm, corporation, wholesaler, retailer, distributor, any local, state, or federal governmental agency, or any other person who applies fertilizer to the land of a consumer or client or to land they own or to land which they lease or otherwise hold rights.

Definitions (1) - (4) are used in the proposed Nutrient Management Rule (2B .0239).

(2) 'Commercial applicator' means any person, firm, corporation, wholesaler, retailer, distributor or any other person who for hire or compensation applies fertilizer to the land of a consumer or client.

(3) 'Fertilizer' means any substance containing nitrogen or phosphorus which is used primarily for its plant food content.

(4) 'Cropland' means agricultural land that is not covered by a certified animal waste management plan and is used for growing corn, grains, oilseed crops, cotton, forages, tobacco, beans, or other vegetables or fruits.

(5) 'Riparian area' means an area of trees, usually accompanied by shrubs and other vegetation, that is adjacent to a body of water which is managed to reduce the impact of upland sources of pollution by trapping, filtering, and converting nutrients, sediments, and other chemicals; maintain the integrity of stream channels, shorelines, and flood storage processes; and to supply food, cover, and thermal protection for fish and other aquatic life.

Definition (5) is used in the Rules pertaining to Protection and Maintenance of Existing Riparian Areas (2B .0233) and Agricultural Nitrogen Reduction(2B .0238).

15A NCAC 2B .0232 is proposed for adoption as follows:

.0232 NEUSE RIVER BASIN- NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY: BASIN NUTRIENT REDUCTION GOAL

Rule states the overall nitrogen reduction goal and identifies Rules which comprise the overall strategy.

Pursuant to 1995 (Reg. Sess., 1996) N.C. Session Laws, c. 572, the Environmental Management Commission hereby establishes the goal of reducing the average annual load of nitrogen delivered to the Neuse River Estuary from point and nonpoint sources by a minimum of 30 percent of the average annual load for the period 1991 through 1995 by the year 2001. All waters of the Neuse River Basin have been supplementally classified as Nutrient Sensitive Waters (NSW) pursuant to 15A NCAC 2B .0223. The following procedures are to be implemented in accordance with 15A NCAC 2B .0223 in all waters of the Neuse River Basin:

(1) NSW management requirements for the Neuse River Basin are specified in the following Rules of this Section:
   (a) Rule .0233 for protection and maintenance of existing forested riparian areas,
   (b) Rule .0234 for wastewater discharges,
   (c) Rule .0235 for urban stormwater management,
   (d) Rules .0236 and .0238 for agricultural nitrogen reduction,
   (e) Rule .0239 for nutrient management, and
   (f) Rule .0240 for nitrogen offset fees.

15A NCAC 2B .0233 is proposed for adoption as follows:

.0233 NEUSE RIVER BASIN: NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY: PROTECTION AND MAINTENANCE OF EXISTING RIPARIAN AREAS

The following is the management strategy for maintaining and protecting existing riparian areas in the Neuse River Basin:

(1) Existing riparian areas shall be protected and maintained in accordance with Sub-Items (3) (a)-(e) on all sides of surface waters in the Neuse River Basin indicated as intermittent streams, perennial streams, lakes, and estuaries on the most recent versions of United States Geological Survey 1:24,000 scale (7.5 minute quadrangle) topographic maps. This Rule only applies to riparian areas where forest vegetation is established in Zone 1 (as described in Sub-Item 3(a)) as of the effective date of this Rule. THIS RULE DOES NOT ESTABLISH NEW BUFFERS IN RIPARIAN AREAS. Exceptions to the requirements of this Rule for existing riparian areas are described in Sub-Items (1)(a-h). Maintenance of the riparian areas should be such that, to the maximum extent possible, sheet flow of surface water is achieved. Any activities that would result in water quality standard violations or that disrupt the structural or functional integrity of the riparian area are prohibited.

*Protecting and maintaining existing riparian areas - **This Rule does not establish new buffers in riparian areas***

The following waterbodies and land uses are exempt from the riparian area protection requirements:

(a) Ditches and manmade conveyances other than modified natural streams;

Ditches are exempt

(b) Areas mapped as intermittent streams, perennial streams, lakes, or estuaries on the most recent versions of United States Geological Survey 1:24,000 scale (7.5 minute quadrangle) topographic maps where no perennial or intermittent waterbody actually exists on the ground;

Map errors addressed

(c) Ponds and lakes created for animal watering, irrigation, or other agricultural uses that are not part of a natural drainage way that is classified in accordance with 15A NCAC 2B .0100;

(d) Where application of this Rule would prevent all prospective uses of a lot platted and recorded prior to the effective date of this Rule, a variance may be granted by the Environmental Management Commission;

Variances

(e) New development in the riparian area shall be limited to water dependent structures as defined in 15A NCAC 2B .0202. Any such structures shall be located, designed, constructed and maintained to provide maximum nutrient removal, to have the least adverse effects on aquatic life and habitat and to protect water quality;

Water dependent structures are those structures for which the use requires access or proximity to or siting within surface waters to fulfill its basic purpose, such as boat ramps, boat houses, docks and bulkheads. Ancillary facilities such as restaurants, outlets for boat supplies, parking lots and commercial storage areas are not water dependent structures.

(f) Roads, bridges, stormwater management facilities, ponds, and utilities may be allowed where no practical alternative exists. These structures shall be located, designed, constructed, and maintained to have minimal disturbance, to provide maximum nutrient removal and erosion protection, to have the least adverse effects on aquatic life and habitat, and to protect water quality to the maximum extent practical through the use of best management practices;

(g) Stream restoration projects, scientific studies, stream gauging, water wells, passive recreation facilities such as boardwalks, trails, pathways, historic preservation and archaeological activities are allowed; and

(h) Stream crossings associated with timber harvesting are allowed if performed in accordance with the Forest Practices Guidelines Related to Water Quality (15A NCAC 1J .0201-.0209).

(2) If a local government has been issued a Municipal Separate Stormwater Sewer System permit or has been delegated to implement a local stormwater program, then the local government shall ensure that the riparian areas to be protected are, as a standard practice, recorded on plats as easements.

Provision for local government implementation of the riparian area requirements.

(3) The protected riparian area shall have two zones as follows:

(a) Zone 1 is intended to be an undisturbed forest. Zone 1 begins at the centerline of the channel for intermittent streams and perennial streams without tributaries and extends landward a distance of 30 feet on all sides of the waterbody, measured horizontally on a line perpendicular to the waterbody. For all other waterbodies, Zone 1 begins at the upper edge of the active channel of the surface waterbody (bank-full flow) or the mean high water line and extends landward a distance of 30 feet, measured horizontally on a line perpendicular to the waterbody. Forest vegetation of any width that exists in Zone 1 on the effective date of this Rule must be preserved and maintained in accordance with Sub-Items (i)-(v). The application of fertilizer in Zone 1 is prohibited. The following practices and activities are allowed in Zone 1:

Zone 1 (30 ft) functions to remove and transform the nutrients, sediments and pollutants that may move through Zone 2 as well as to stabilize the stream bank and prevent erosion.

Zone 1 vegetation also controls the stream environment by providing shade to moderate temperatures, and by maintaining aquatic life uses.

(i) Natural regeneration of forest vegetation is allowed and planting vegetation to enhance the riparian zone is allowed if disturbance is minimized. Any plantings should primarily consist of locally native trees and shrubs;

(ii) Selective removal of individual high value trees is allowed where water quality values are not compromised. Limited mechanized equipment is allowed in this area;

(iii) Horticulture practices may be used to maintain the health of individual trees;

(iv) Individual trees may be removed which are in danger of causing damage to dwellings, other structures, or the stream channel; and

(v) Other timber cutting techniques approved by the Department may be undertaken if necessary to prevent extensive pest or disease infestation.

(b) Zone 2 begins at the outer edge of Zone 1 and extends landward a minimum of 20 feet as measured horizontally on a line perpendicular to the waterbody. The combined minimum width of Zones 1 and 2 shall be 50 feet on all sides of the waterbody. Vegetation in Zone 2 shall consist of a dense ground cover composed of herbaceous or woody species which provides for diffusion and infiltration of runoff and filtering of pollutants. The following practices and activities are allowed in Zone 2 in addition to those allowed in Zone 1: Removal of grass clippings or plant products such as timber, nuts, and fruit is allowed on a periodic and regular basis provided the intended purpose of the riparian area is not compromised by harvesting, disturbance, or loss of forest or herbaceous ground cover. Forest vegetation in Zone 2 may be managed to minimize shading on adjacent land if the water quality function of the riparian area is not compromised. The following practices and activities are not allowed in Zone 2:

The purpose of Zone 2 (20 ft) is to provide sediment filtering, nutrient uptake and the space necessary to convert concentrated flow to uniform, shallow, sheet flow.

(i) New permanent structures;

(ii) New on-site sanitary sewage systems which use ground adsorptions;

(iii) Activities that would result in water quality standards violations or disrupt the structural or functional integrity of the riparian area are prohibited.

Activities not allowed in Zone 2

(c) Timber removal and skidding of trees shall be directed away from the water course or water body. Skidding shall be done in a manner to prevent creation of ephemeral channels perpendicular to the water body. Any tree removal must be performed in a manner that does not compromise the intended purpose of the riparian area and is in accordance with the Forest Practices Guidelines Related to Water Quality (15A NCAC 1J .0201-.0209).

Timber removal in the riparian area

(d) Maintenance of Zones 1 and 2 is required. Sheet flow must be maintained to the maximum extent practical through dispersing concentrated flow and/or re-establishment of vegetation to maintain the effectiveness of the riparian area. Periodic corrective action to restore sheet flow must be taken by the landowner if necessary to impede the formation of erosion gullies which allow concentrated flow to bypass treatment in the riparian area.

Sheet flow maintenance is required to ensure that the riparian areas function to reduce nutrient loading as intended.

(e) Periodic maintenance of modified natural streams such as canals is allowed provided that disturbance is minimized and the structure and function of the riparian area is not compromised. A grassed travelway is allowed on one side of the waterbody when alternative forms of maintenance access are not practical. The width and specifications of the travelway shall be only that needed for equipment access and operation. The travelway should be located to maximize stream shading.

Maintenance of manmade conveyances

(4) Where the standards and management requirements for riparian areas are in conflict with other laws, regulations, and permits regarding streams, steep slopes, erodible soils, wetlands, floodplains, forest harvesting, surface mining, land disturbance activities, development in Coastal Area Management Act Areas of Environmental Concern, or other environmental protection areas, the more protective shall apply so long as they are in effect.

15A NCAC 2B .0234 is proposed for adoption as follows:

.0234 NEUSE RIVER BASIN - NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY: WASTEWATER DISCHARGE REQUIREMENTS

The following is the wastewater discharge management strategy for the Neuse River Basin:

Wastewater Point Source Discharger Requirements.

(1) All new and expanding dischargers will be required to document that all practical alternatives to surface water discharge were evaluated pursuant to 15A NCAC 2H .0105(c)(2), prior to a submittal of an application for a discharge. For purposes of this rule, permitted discharges means those individually permitted and not those covered under general permits.

(2) All wastewater dischargers greater than or equal to 0.5 million gallons per day (MGD) permitted flow, regardless of current loading levels, are required to evaluate and optimize the operation of their facilities in order to reduce nutrient loadings. One year after the effective date of this rule, a report shall be submitted to the Division by each wastewater discharger or collectively by an Association, documenting the efforts/level of reductions achieved.

(3) The collective total nitrogen load for all individually permitted wastewater discharges shall, on an annual mass basis, be no more than 2.8 million pounds per year, unless individual wastewater discharges separately or collectively purchase a portion of the nonpoint source allocation in accordance with the formula for offset payments set forth in 15A NCAC 2B .0240.

(4) Any existing individual discharger or collective group of wastewater dischargers that accepts wastewater from another wastewater treatment facility in the Neuse River Basin which results in the elimination of the discharge from that wastewater treatment facility shall be allowed to increase the annual mass load of total nitrogen discharged by the annual mass load of total nitrogen allocated to the wastewater treatment facility that is eliminated. If the wastewater treatment system that is to be eliminated has a permitted flow of less than 0.5 MGD, the annual mass load of total nitrogen shall be calculated from the most recent available data on that facility.

(5) All dischargers within the basin will have the option of forming an Association to meet their allocated total nitrogen load collectively.

Establishes the option for dischargers to set up a coalition to jointly reduce total nitrogen loads.

(a) For dischargers that join an Association, an agreement will be drafted between the Division and the Association that includes annual loading targets. Using each Association member's 1995 total nitrogen load, the annual loading target shall be calculated as 70 percent of the load from those discharges below the Falls Lake dam plus 10 percent of the load from those dischargers above the dam.

Association Member Requirements.

This annual total nitrogen loading target shall be met within five years of the effective date of this rule. The agreement may also require stepwise decreases in total nitrogen loads for the 5 years following the effective date of this rule. The Association shall also be required to document reduction in total nitrogen loadings for any member facilities located in Craven, Jones, Pamlico and Carteret Counties as a result of their immediate proximity to the estuary. If the Association does not meet its annual total nitrogen loading target in any given year, the Association shall make payments for nonpoint source controls at a rate as set in 15A NCAC 2B .0240 of this section. No Association exists, for the purposes of this Rule, until the agreement is formally approved by the Commission.

All existing Association dischargers below Falls Lake Dam that have a permitted flow greater than or equal to 0.5 MGD will receive a quarterly average total phosphorus limit of 2 mg/l in their NPDES permits. All existing Association dischargers above Falls Lake Dam that have a permitted flow greater than or equal to 0.05 MGD will receive a quarterly average total phosphorus limit of 2 mg/l in their NPDES permits. New and expanding Association dischargers will receive a quarterly average total phosphorus limit of 2 mg/l in their NPDES permits. More stringent phosphorous limits may apply to protect water quality standards in localized areas.

(b) For dischargers that do not join an Association, or if no Association of dischargers is formed, the following requirements apply:

(i) All existing dischargers greater than or equal to 0.5 MGD below Falls Lake Dam must individually meet an annual mass load of total nitrogen based on a concentration of 3.5 mg/l and their 1995 permitted flow within five years from the effective date of this rule. These facilities must meet a quarterly average total phosphorus limit of 2 mg/l. More stringent limits may apply to protect water quality standards in localized areas.

(ii) All existing facilities above Falls Lake Dam with permitted flows greater than or equal to 0.05 MGD will be required to meet a quarterly average total phosphorous limit of 2 mg/l. More stringent limits may apply to protect water quality standards in localized areas.

(iii) All expanding wastewater dischargers, where discharge is the only environmentally and economically feasible option, must document their ability to comply with an annual mass load of total nitrogen based on a concentration of 3.5 mg/l and their 1995 permitted flow. An expanding wastewater discharger may obtain allocation from the load established under paragraph (3) from other existing dischargers. An expanding wastewater discharger which can not comply with the annual mass load or obtain an allocation from other existing dischargers' load, may purchase a portion of the nonpoint source load allocation at a rate of 110 percent of the cost as set in 15A NCAC 2B .0240 of this Section to implement practices designed to reduce that same loading created by the expanding discharge. Payment for the portion of the nonpoint source load allocation purchased shall be made prior to permit issuance. The expanding discharge shall at a minimum comply with an annual mass load of total nitrogen based on a concentration of 3.5 mg/l and their expanded permitted flow. These facilities must meet a monthly average total phosphorous limit of 1 mg/l. More stringent limits may be given to protect water quality standards in localized areas.

Requirements for dischargers that are not members of the Association. and requirements for all dischargers if no Association is formed.
New means:
- proposed facilities that do not have a NPDES permit nor have any facilities constructed;
- facilities which physically exist, however were illegally constructed (i.e. received no agency approvals);
- facilities which have received a NPDES permit and have received an Authorization to Construct but have not begun significant construction of any wastewater treatment facilities within term of the current permit;
- any increases in treatment plant hydraulic capacity, which has not received an Authorization to Construct will be considered new and new effluent limitations and other requirements, if applicable, would be imposed for the entire facility.
Existing means:
- facilities which physically exist and have legally constructed (i.e. proper agency approval was received or was constricted prior to agency approval was received or was constructed prior to agency approval being required);
- facilities which have received a NPDES permit and have received an Authorization to Construct and have constructed or begun significant construction of any wastewater treatment facilities within the term of the current permit;

(iv) New municipal wastewater dischargers that develop a wastewater treatment system to resolve water quality problems caused by existing failing subsurface systems and that have no alternative other than to discharge, shall document efforts to obtain allocation from the load established in paragraph (3) of this section from existing wastewater dischargers. If allocation can not be obtained from the existing dischargers, the new municipal discharger may purchase a portion of the nonpoint source load allocation at a rate of 110 percent of the cost as set in 15A NCAC 2B .0240 of this Section to implement practices designed to reduce that same loading created by the new discharge. Payment for the portion of the nonpoint source load allocation purchased shall be made prior to permit issuance. The new municipal discharger shall at a minimum comply with an annual mass load of total nitrogen based on a concentration of 3.5 mg/l and their permitted flow. These facilities must meet a monthly average total phosphorous limit of 1 mg/l. More stringent limits may be given to protect water quality standards in localized areas.

(v) All new wastewater dischargers shall document efforts to obtain allocation from the load established in paragraph (3) of this section from existing wastewater discharges. If allocation can not be obtained from the existing dischargers, new dischargers may purchase a portion of the nonpoint source load allocation at a rate of 200 percent of the cost as set in 15A NCAC 2B .0240 of this Section to implement practices designed to reduce that same loading created by the new discharge. Payment for the portion of the nonpoint source load allocation purchased shall be made prior to permit issuance. The new discharge shall at a minimum comply with an annual mass load of total nitrogen based on a concentration of 3.5 mg/l and their permitted flow. These facilities must meet a monthly average total phosphorous limit of 1 mg/l. More stringent limits may be given to protect water quality standards in localized areas.

- facilities which have received a phased NPDES permit and have received an Authorization to Construct for a phase of the permitted flow and have constructed or begun significant construction of the phased flow. Significant Construction means: - more than a token or nominal investment of money or other resources in the actual construction of the wastewater treatment facility, based on the facility size, complexity, cost and the required construction time for completion.

15A NCAC 2B .0235 is proposed for adoption as follows:

Stormwater Requirements

.0235 NEUSE RIVER BASIN- NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY: BASINWIDE STORMWATER REQUIREMENTS

10 Municipalities and 5 Counties designated for stormwater management

(1) The following local governments shall be designated, based on population, for stormwater management requirements as part of the Neuse River Nutrient Sensitive Waters stormwater management strategy:
- (a) Cary,
- (b) Durham,
- (c) Garner,
- (d) Goldsboro,
- (e) Havelock,
- (f) Kinston,
- (g) New Bern,
- (h) Raleigh,
- (i) Smithfield,
- (j) Wilson
- (k) Durham County,
- (l) Johnston County,
- (m) Orange County,
- (n) Wake County, and
- (o) Wayne County.

(2) Other incorporated areas, not listed under Item (1), within affected counties may seek to implement their own local stormwater management plan by complying with the requirements specified in Items (5), (6) and (7) of this rule.

Designation of additional local governments.

(3) The Environmental Management Commission may designate additional local governments based on their potential to contribute significant nitrogen loads to the Neuse River. The Commission shall review the need to designate additional local governments, based on population growth or pollution potential. At a minimum, the Commission shall review the need for additional designations to the stormwater management program as part of the basinwide planning process for the Neuse River Basin. Any local governments that are designated at a later date under the Neuse Nutrient Sensitive Waters Stormwater Program shall meet the requirements under Items (5), (6) and (7) of this rule.

A model stormwater plan will be developed by DWQ.

(4) Within 12 months of the effective date of this rule, the Division of Water Quality shall submit a model local stormwater management program plan to control nutrients to the Commission for approval. The Division will work in cooperation with subject local governments in developing this model plan. The model plan shall address nitrogen reductions for both existing and new development and include, but not be limited to, the following elements:

Components of the plan

- (a) Review and approval of stormwater management plans for new developments to ensure that:
  - (i) the nitrogen load contributed by new development activities is held at 70% of the nitrogen load contributed by the 1995 land use. The local governments may use the design standard of 3.6 pounds/acre/year, determined

by the Environmental Management Commission as 70% of the average collective nitrogen load for the 1995 non-urban land uses in the basin above New Bern. The EMC may periodically update the design standard based on the availability of new scientific information. Developers shall have the option of partially offsetting their nitrogen loads by funding wetland or riparian area restoration through the North Carolina Wetland Restoration Fund; however, before using offset payments, the development must attain, at a minimum, a nitrogen export that does not exceed 6 pounds/acre/year for residential development and 10 pounds/acre/year for commercial or industrial development.

(ii) there is no net increase in peak flow from the predevelopment conditions for the 1-year, 24-hour storm.

(b) Review of new development plans for compliance with requirements for protecting and maintaining existing riparian areas as specified in Rule 15A NCAC 2B .0233;

(c) Implementation of public education programs;

(d) Identification and removal of illegal discharges;

(e) Identification of suitable locations for potential stormwater retrofits (such as riparian areas) that could be funded by various sources; and

(f) Annually report on net changes to nitrogen load from urban area.

(5) Within 18 months of the effective date of this Rule or later designation (as described in Item (3)), subject local governments shall submit their local stormwater management program plans to the Commission for review and approval. These local plans shall equal or exceed the model local stormwater management program plan established in Item (4). Local governments may submit a more stringent local stormwater management program plan. Local stormwater management programs and modifications to these programs shall be kept on file by the Division of Water Quality.

Within 18 months of the effective date of this Rule, the designated local governments will submit their program plans for addressing new and existing development to the EMC. The plans must equal or exceed the DWQ model.

(6) Within 24 months of the effective date of the rule or designation, subject local governments are required to adopt and implement a local stormwater management program according to their approved plan. Local governments administering a stormwater management program are required to submit annual reports to the Division documenting their progress by November 30 of each year.

Within 24 months of the effective date of this Rule, the designated local governments will adopt and implement their local stormwater management programs for addressing new and existing development and submit annual reports.

(7) If a local government fails to submit an acceptable local stormwater management program plan or fails to properly implement an approved plan, then stormwater management requirements for existing and new urban areas within its jurisdiction will be administered through the NPDES municipal stormwater permitting program per 15A NCAC 2H .0126.

If a designated local government fails to develop or implement an acceptable plan then the requirements will be administered through the NPDES municipal stormwater permitting program.

(a) Subject local governments will be required to develop and implement comprehensive stormwater management programs, tailored toward nitrogen reduction, for both existing and new development.