

***Town of Garner
Stormwater Program
for Nitrogen Control***



February 17, 2001

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1. Introduction

On December 11, 1997 the North Carolina Environmental Management Commission (EMC) adopted permanent rules to support implementation of the Neuse River Nutrient Sensitive Waters Management Strategy (Neuse NSW Strategy). The goal of the strategy is to achieve a 30 percent nitrogen reduction from each controllable and quantifiable source of nitrogen in the basin. These sources are point source discharges associated with wastewater treatment plants and nonpoint source discharges associated with agriculture operations and urban stormwater runoff.

As a part of the rules fifteen local governments in the Neuse Basin, including the Town of Garner, were required to implement local stormwater management plans aimed at achieving the 30 percent nitrogen reduction goal as it relates to the nonpoint urban stormwater runoff component.

In order to assist the local governments in developing these stormwater management plans the North Carolina Division of Water Quality (DWQ) along with representatives from each of the fifteen affected local governments developed a model stormwater management plan that could serve as the basis for a local government's stormwater management plan. The stormwater management plan for the Town of Garner closely follows the model plan. As such, some of the components of the model plan are incorporated directly into Garner's local plan while other components have been modified.

The rules require that four general elements must be addressed in the local government stormwater management plan. These elements are as follows:

- New Development Review/Approval
- Illegal Discharges
- Retrofit Location
- Public Education

Within each element there are certain minimum requirements that must be addressed in order to comply with the rules. Some of these requirements involve certain actions and programs that must be undertaken by the Town of Garner. These requirements are addressed specifically in this plan. Other requirements involve the legislation and enforcement of development guidelines and land use regulations within the community. These requirements are addressed generally within this plan and are accompanied with specific ordinances that will be incorporated in the Town's Land Use Ordinance and/or Town Code.

2. New Development Review/Approval

2-A. Requirements in the Rule

The Neuse Stormwater Rule (15A NCAC 2B .0235) has certain broad requirements for new development. These requirements are incorporated as a part of this plan and are as follows:

- New development shall comply with the requirements for protecting and maintaining riparian buffers as specified in 15A NCAC 2B .0233.
- The nutrient load contributed by new development activities is held at 3.6 pounds per acre per year. This is equivalent to 70 percent of the estimated average nitrogen load contributed by the non-urban areas in the Neuse River basin (as defined using 1995 LANDSAT data). The Environmental Management Commission may periodically update the performance standard based on the availability of new scientific information.
- Developers shall have the option of partially offsetting projected nitrogen loads by funding wetland or riparian area restoration through the North Carolina Wetland Restoration Program. However, the total nitrogen loading rate cannot exceed 6.0 pounds per acre per year for residential development or 10 pounds per acre per year for non-residential development.
- Except in certain situations, stormwater detention will be required on new projects. The design standard for detention will be based upon peak flow reduction to predevelopment (existing) conditions for the 1 year, 10 year, and 25 year return frequency storm events.

Section 253 of the Garner Land Use Ordinance requires that all new development comply with the provisions of this plan. A copy of this ordinance is presented in Appendix A.

2-B. Protecting Riparian Areas on New Development

Riparian areas shall be protected on new developments in accordance with the Riparian Buffer Rule (15A NCAC 2B .0233). The Riparian Buffer Rule requires that 50-foot riparian buffers be maintained on all sides of intermittent and perennial streams, ponds, lakes and estuaries in the Neuse River basin. The rule includes some uses that are allowable within the riparian buffer and some that are allowable with mitigation. The table of uses in 15A NCAC 2B .0233(6) lists those uses that are allowable in the riparian buffer and is presented in Appendix B.

No new development shall be allowed within the first 50 feet adjacent to a waterbody that is shown on either the USGS topographic map or the NRCS Soil Survey maps unless the owner can show that the activity has been approved by DWQ. DWQ approval may consist of the following:

- An Authorization Certificate that documents that DWQ has approved an allowable use such as a road crossing or utility line. A detailed list of allowable uses is included in the table of uses in 15A NCAC 2B .0233(6).
- An opinion from DWQ that vested rights have been established for the proposed development activity.
- A letter from DWQ documenting that a variance has been approved for the proposed development activity.
- A letter from DWQ documenting that, based upon a field stream classification inspection, the USGS topographic map and the NRCS soil survey maps are in error and an intermittent and perennial stream, pond, or lake does not exist.

2-C. Calculating N Export from New Development

For the purposes of the Neuse Stormwater Management Plan, new development shall be defined as to include the following:

- Any activity that disturbs greater than one acre of land in order to establish, expand or modify a single family or duplex residential development or a recreational facility.
- Any activity that disturbs greater than one-half an acre of land in order to establish, expand or modify a multifamily residential development or a commercial, industrial or institutional facility.
- Existing impervious surfaces that will remain or are disturbed as a part of site redevelopment or modification shall not be included when calculating land disturbance area or nitrogen export.

New development shall NOT include agriculture, mining or forestry activities. Land disturbance is defined as grubbing, stump removal and/or grading of existing pervious areas.

Property owners that can demonstrate that they have vested rights as of March 9, 2001 will not be subject to the requirements for new development. Vested rights may be based on at least one of the following criteria:

- (a) substantial expenditures of resources (time, labor, money) based on a good faith reliance upon having received a valid local government approval to proceed with the project, or
- (b) having an outstanding valid building permit in compliance with G.S. 153A-344.1 or G.S. 160A-385.1, or
- (c) having an approved site specific or phased development plan in compliance with G.S. 153A-344.1 or G.S. 160A-385.1.

Projects that require a state permit, such as landfills, NPDES wastewater discharges, land application of residuals and road construction activities shall be considered to have vested rights if a state permit was issued prior to March 9, 2001.

The nitrogen export from each new development must be calculated. This export will be calculated in pounds per acre per year (lbs/ac/yr). Model methodologies that will be used to make this calculation are presented below; however, in certain cases a development may propose an alternative methodology to calculate nitrogen export. The alternative method may be used if it can be demonstrated to be equivalent and is acceptable to the North Carolina Division of Water Quality.

- Method 1 is intended for residential developments where lots are shown but the actual footprint of buildings are not known. This method does not require calculation of the area of building footprints. Rather, the impervious surface resulting from building footprints is estimated based on typical impervious areas associated with a given lot size. This method is shown in Figure 2a.
- Method 2 is to be used for residential developments where the amount of built upon areas can be accurately estimated and for all commercial and industrial developments. Method 2 is shown in Figure 2b.

In commercial and industrial projects where the built upon areas are not shown on the site plan (such as out parcels or commercial lot subdivisions) the amount and types of land cover may be estimated. This estimate will be used to develop the total nitrogen export in pounds per year. This calculated nitrogen export will become the maximum allowable nitrogen export for the project and will become a condition of the site plan and will be used to determine structural Best Management Practices (BMP)/fee requirements. Build out of the project will not be allowed to occur in such a manner that the total nitrogen export, based upon actual land types developed, exceeds the maximum allowable nitrogen export determined as a part of the original site plan review.

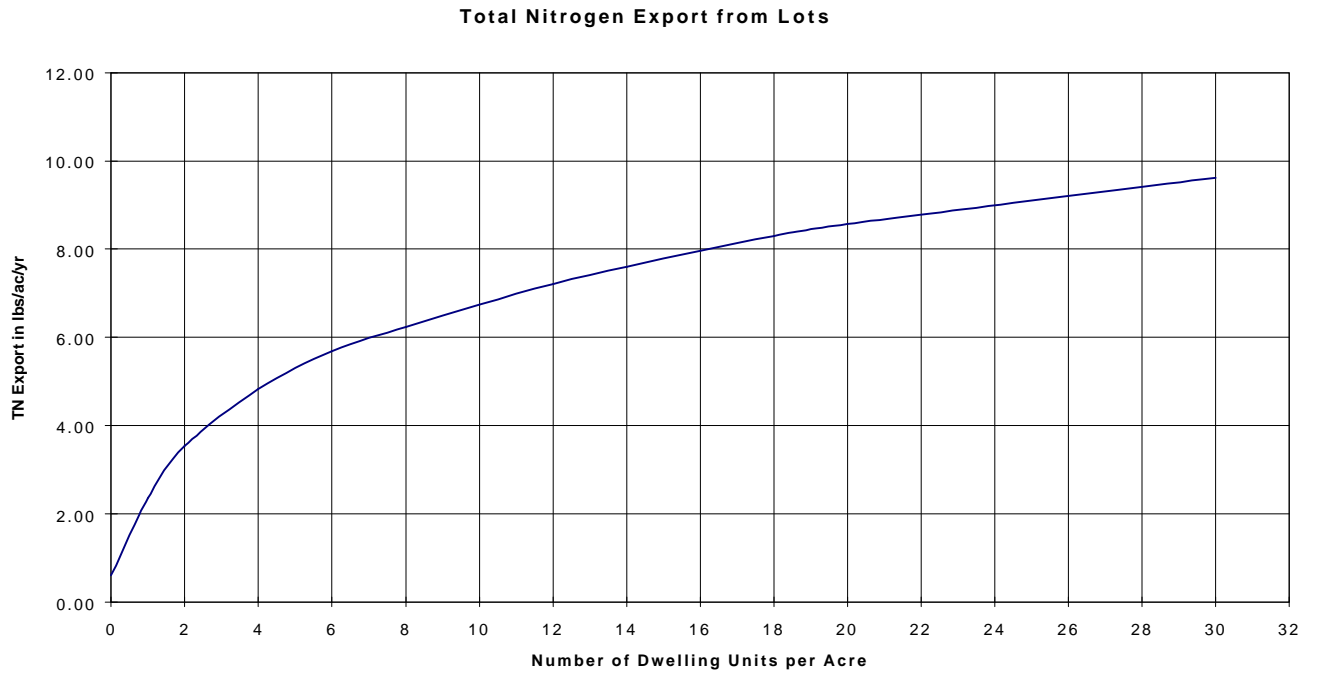
For these commercial and industrial projects any required BMPs will be designed based upon the overall project layout and not on an individual lot basis. Installation of BMPs and/or payment of nitrogen offset fees would be required based upon actual development as it occurs.

Figure 2a: Method 1 for Quantifying TN Export from Residential Developments when Building and Driveway Footprints are Not Shown

- Step 1: Determine area for each type of land use and enter in Column (2).
- Step 2: Total the areas for each type of land use and enter at the bottom of Column (2).
- Step 3: Determine the TN export coefficient associated with lots using Graph 1.
- Step 4: Determine the TN export coefficient associated with right-of-way using Graph 2.
- Step 5: Multiply the areas in Column (2) by the TN export coefficients in Column (3) and enter in Column (4).
- Step 6: Total the TN exports for each type of land use and enter at the bottom of Column (4).
- Step 7: Determine the export coefficient for site by dividing the total TN export from uses at the bottom of Column (4) by the total area at the bottom of Column (2).

(1) Type of Land Cover	(2) Area (acres)	(3) TN export coeff. (lbs/ac/yr)	(4) TN export from use (lbs/yr)
Permanently protected undisturbed open space (forest, unmown meadow)		0.6	
Permanently protected managed open space (grass, landscaping, etc.)		1.2	
Lots (read TN export from Graph 1)			
Right-of-way (read TN export from Graph 2)			
TOTAL			

Graph 1: Total Nitrogen Export from Lots



Graph 2: Total Nitrogen Export from Pavement.

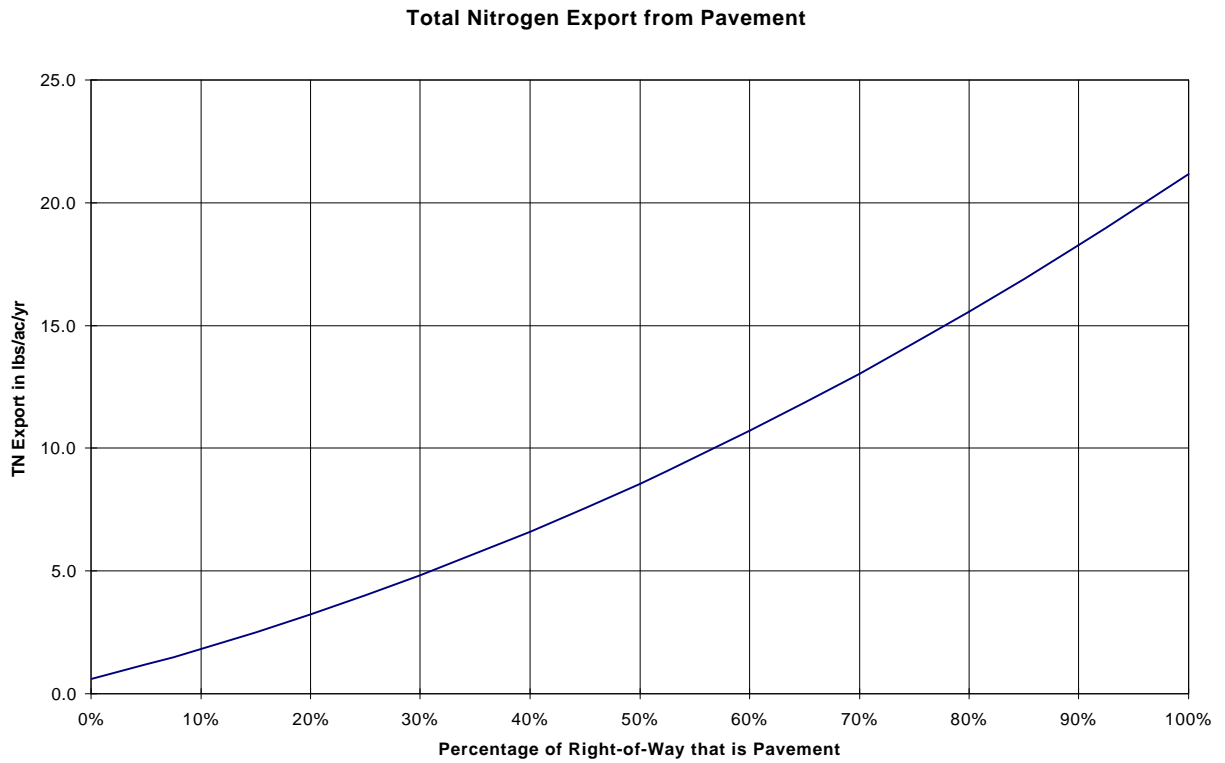


Figure 2b: Method 2 for Quantifying TN Export from Residential Developments when Footprints of all Impervious Surfaces can be estimated and for all Industrial/Commercial Developments

- Step 1: Determine area for each type of land use and enter in Column (2).
- Step 2: Total the areas for each type of land use and enter at the bottom of Column (2).
- Step 3: Multiply the areas in Column (2) by the TN export coefficients in Column (3) and enter in Column (4).
- Step 4: Total the TN exports for each type of land use and enter at the bottom of Column (4).
- Step 5: Determine the export coefficient for site by dividing the total TN export from uses at the bottom of Column (4) by the total area at the bottom of Column (2).

(1) Type of Land Cover	(2) Area (acres)	(3) TN export coeff. (lbs/ac/yr)	(4) TN export from use (lbs/yr)
Permanently protected undisturbed open space (forest, unmown meadow)		0.6	
Permanently protected managed open space (grass, landscaping, etc.)		1.2	
Impervious surfaces (roads, parking lots, driveways, roofs, paved storage areas, etc.)		21.2	
TOTAL		---	

All new developments must achieve a nitrogen export of less than or equal to 3.6 pounds per acre per year. If the development contributes greater than 3.6 lbs/ac/yr of nitrogen, then the options shown in Table 2a are available based on whether the development is residential or non-residential.

Table 2a: Nitrogen Export Reduction Options

Residential	Commercial / Industrial
<p>If the computed export is less than 6.0 lbs/ac/yr, then the owner may either:</p> <ol style="list-style-type: none"> 1. Install BMPs to remove enough nitrogen to bring the development down to 3.6 lbs/ac/yr. 2. Pay a one-time offset payment of \$330/lb to bring the nitrogen down to the 3.6 lbs/ac/yr. 3. Do a combination of BMPs and offset payment to achieve a 3.6 lbs/ac/yr export. 	<p>If the computed export is less than 10.0 lbs/ac/yr, then the owner may either:</p> <ol style="list-style-type: none"> 1. Install BMPs to remove enough nitrogen to bring the development down to 3.6 lbs/ac/yr. 2. Pay a one-time offset payment of \$330/lb to bring the nitrogen down to the 3.6 lbs/ac/yr. 3. Do a combination of BMPs and offset payment to achieve a 3.6 lbs/ac/yr export.

<p>If the computed export is greater than 6.0 lbs/ac/yr, then the owner must use on-site BMPs to bring the development's export down to 6.0 lbs/ac/yr. Then, the owner may use one of the three options above to achieve the reduction between 6.0 and 3.6 lbs/ac/yr.</p>	<p>If the computed export is greater than 10.0 lbs/ac/yr, then the owner must use on-site BMPs to bring the development's export down to 10.0 lbs/ac/yr. Then, the owner may use one of the three options above to achieve the reduction between 10.0 and 3.6 lbs/ac/yr.</p>
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The offset payment mentioned in Table 2a shall be paid to the Wetlands Restoration Program (WRP). The WRP will utilize these fees in accordance with the WRPs Basinwide Wetlands and Riparian Restoration plans. It is the policy of the WRP to utilize the funds where they are generated to the maximum extent possible as long as they can obtain the cooperation of the local government. Written acknowledgement by WRP that the fee has been paid must be received by the Town of Garner prior to recording the final plat for subdivision or prior to issuance of a Certificate-of-Occupancy for site plans.

2-D. Calculating Peak Runoff Volume

The Neuse Stormwater Rule requires there be no net increase in peak flow leaving the site from the predevelopment conditions for the 1-year, 24-hour storm. The Town of Garner also requires peak flow reduction for the 10-year and 25-year storm.

Acceptable methodologies for computing the pre- and post-development conditions for the 1-year, 24-hour storm include:

- The Rational Method.
- The Peak Discharge Method as described in USDA Soil Conservation Services Technical Release Number 55 (TR-55).

The same method must be used for both the pre- and post-development conditions.

Impact design data for the rainfall depth and intensities are as follows:

1 yr – 24 hr storm depth (TR-55)	3.00 inches
1 yr – 6 hr storm depth (Malcolm)	2.1 inches

1 year intensity $I = g/(h + t)$
 where: I = intensity in inches/hour
 t = time of concentration in minutes
 g = 104
 h = 18

Design of any detention devices required to reduce post development peak flow shall use the design method contained in Elements of Urban Stormwater Design (Malcolm).

The peak flow control requirement is not required for developments that meet any of the following conditions:

- The increase in peak flow between pre- and post-development conditions does not exceed ten percent (note that this exemption makes it easier to conduct redevelopment activities).
- The proposed new development meets all of the following criteria: overall impervious surface is less than fifteen percent, and the remaining pervious portions of the site are utilized to the maximum extent practical to convey and control the stormwater runoff.
- It can be demonstrated that detention will increase local flooding problems downstream. In addition detention for the 10-year and 25-year storm will not be required when it can be demonstrated that the increase in total peak flow at local flood prone areas downstream will increase only an insignificant (less than 2.0 percent) amount.

2-E. BMPs for Reducing Nitrogen

Designing best management practices that remove nitrogen from stormwater is a developing field. Researchers throughout the country, particularly in the Southeast, are conducting studies to determine effective means of controlling nitrogen. At the present time, current data indicate that most BMPs remove only 20 to 40 percent of total nitrogen on a consistent basis. All BMPs require regular maintenance and some have varying performance depending on soil type and the season. It is crucial to consider the issues of aesthetics, long-term maintenance, safety and reliability in BMP design.

The BMPs which may be utilized for reducing nitrogen from new developments, along with their associated nitrogen removal rates and design standards, are shown in Table 2b. The BMPs are arranged in order of preference by the Town, with the top BMP being most desirable and the bottom being least desirable.

Table 2b: BMP Types, TN Removal Rates and Design Standards

BMP Type	TN Removal Rate based on Current Literature Studies	Appropriate Design Standards
Riparian buffers	30%	Neuse Riparian Buffer Rule (15A NCAC 2B .0233)
Vegetated filter strips with level spreader	20%	NC and MD Design Manuals and other literature information
Open channel practices	30%	NC and MD Design Manuals
Bioretention	25%	NC and MD Design Manuals
Constructed wetlands	40%	NC and MD Design Manuals
Sand Filters	35%	NC and MD Design Manuals
Retention ponds	25%	NC and MD Design Manuals
Proprietary BMPs	Varies	Per manufacturer subject to DWQ approval
Other BMPs	Varies	Subject to DWQ approval

If more than one BMP is installed in series on a development, then the removal rate shall be determined through serial rather than additive calculations. For example, if a retention pond discharges through a riparian buffer, then the removal rate shall be estimated to be 47.5 percent. (The pond removes 25 percent of the nitrogen and discharges 75 percent to the buffer. The buffer then removes 30 percent of the nitrogen that discharged from the pond, which is 22.5 percent. The sum of 25 and 22.5 is 47.5. The removal rate is NOT 25 percent plus 30 percent.)

2-F. BMP Maintenance

The maintenance of any BMP installed to achieve nitrogen loading and/or flow attenuation requirements for a development shall be the responsibility of the property owner or other identified responsible party. In the case of residential or commercial subdivisions Home Owners Association or Merchants Association must be established in order to identify the responsible party.

BMPs will be inspected by the Town on an annual basis. A list of any deficiencies or repairs needed will be forwarded to the property owner/responsible party. The property owner/responsible party shall have ninety (90) days to correct all deficiencies and make all repairs to the satisfaction of the Town Engineer. Failure to satisfactorily complete the repairs within the ninety days will cause the BMP to be declared a nuisance as provided for in Section 6-17 of the Garner Town Code. Abatement of the nuisance will proceed as provided for in Chapter 6, Article II of the Garner Town Code. A copy of this article is presented in Appendix C.

2-G. Land Use Planning Provisions

As a part of the Neuse NSW strategy local governments are encouraged to consider planning techniques which allow developers to reduce impervious surface. Under the model stormwater program the fifteen affected jurisdictions are required to review their local ordinances and address certain specific planning techniques and evaluate the general advantages and disadvantages of incorporating these techniques into the Land Use Ordinance. The specific techniques and approaches are as follows:

- Reducing road width
- Reducing minimum parking requirements
- Minimizing use of curb and gutter
- Use of cluster or open space developments
- Use of traditional neighborhood developments
- Use of mixed-use development

The Town of Garner has recently begun a project to re-write the entire Land Use Ordinance. These efforts will be undertaken by a land planning consultant along with assistance from Town of Garner staff. The specific techniques and approaches listed above will be evaluated as a part of the Land Use Ordinance re-write. It is Garner's intent to also look at other approaches that can be incorporated into the ordinance to encourage less impervious surface and more natural open space. It is anticipated that the Land Use Ordinance re-write will be completed by the fall of 2001.

2-H. Jurisdiction-Wide and Inter-Local Approaches

The Neuse Stormwater Rule allows local governments to implement jurisdiction-wide or inter-local approaches to achieving nitrogen reduction. Garner's Stormwater Program for Nitrogen Control incorporates two specific jurisdiction-wide approaches. The first approach is to allow "land banking" within the Town's jurisdiction. The second specific approach is to credit future development with the nitrogen removal that will occur as a part of the required retention pond construction associated with the Water Supply Watershed Protection Program already in existence.

The "land banking" approach will allow developments to use offsite lands that would have a low nitrogen export value to be combined with the development in order to reduce the nitrogen export value per acre for the combined project. For example, a project may consist of ten acres with a computed nitrogen export value of nine pounds/acre/year. In order to lower the export value a five acre tract of forested land, located in a more remote area, with an existing nitrogen export value of 1.7

pounds/acre/year is included as a part of the project. The nitrogen export value of the combined project is now computed to be 6.6 pounds/acre/year ($[10 \text{ ac} \times 9 \text{ lbs/ac/yr} + 5 \text{ ac} \times 1.7 \text{ lbs/ac/yr}] \div [10 \text{ ac} + 5 \text{ ac}] = 6.6 \text{ lbs/ac/yr}$). In order to use the “land banking” approach the development must meet the following conditions:

- The “land banked” parcel must be within the Town’s planning jurisdiction.
- The “land banked” parcel must have significant water quality value, such as being contiguous to an existing flood plain, wetland or riparian area.
- The “land banked” parcel must be secured in a permanent conservation easement which prohibits farming, unapproved logging practices, or development of any kind.
- The site plan for the development will clearly state that a “land banked” parcel is part of the development project. A map of the “land banked” parcel along with the deed book and page number of the recorded conservation easement will be included as a part of the site plan package.
- Nitrogen export values to be used for the “land banked” parcels will be 1.7 lbs/ac/yr for forest land and wetlands and 4.4 lbs/ac/yr for pasture land.

As a part of the Water Supply Watershed Protection Program the Town of Garner is going to build a regional retention pond to provide for 85% total suspended solids (TSS) removal within the part of Town designated as the ‘Regional Retention Pond Service Area.’ In addition to TSS removal this pond will also provide some removal of nitrogen. This nitrogen reduction will be credited to those projects which are located within the ‘Regional Retention Pond Service Area’ that are not required to have on-site 85% TSS removal BMPs. Based upon the study originally prepared by Ogden Environmental and Energy Services for the Water Supply Watershed Protection Program and additional study by Ogden projects within the Regional Retention Pond District will be able to reduce the calculated nitrogen export loading by 1.3 – 2.0 lbs/ac/yr, depending on which regional pond is constructed. Until a specific site is selected the smaller (1.3) nitrogen credit will be used. A summary of Ogden’s study with results is shown in Appendix D of this plan.

At the present time Garner has no specific plans with regards to any potential inter-local approach to achieve nitrogen reduction; however, the Town does desire that inter-local approaches be available for future consideration should a viable opportunity arise.

3. *Illegal Discharges*

3-A. *Requirements in the Rule*

The Town of Garner will establish a program to prevent, identify and remove illegal discharges as required by the Neuse Stormwater Rule. Illegal discharges are flows in the stormwater collection system that are not associated with stormwater runoff or an allowable discharge. Allowable discharges are shown below in Table 3a. Discharges that are not allowed are shown in Table 3b.

Table 3a: Discharges that may be allowable to the stormwater collection system

Waterline Flushing	Landscape Irrigation	Diverted Stream Flows
Uncontaminated Rising Ground Water	Uncontaminated Ground Water Infiltration to stormwater collection system	Uncontaminated Pumped Ground Water
Discharges from potable water sources	Foundation Drains	Uncontaminated Air Conditioning Condensation
Irrigation Water	Springs	Water from Crawl Space Pumps
Footing Drains	Lawn Watering	Non-commercial Car Washing
Flows from Riparian Habitats and Wetlands	NPDES permitted discharges	Street wash water
Fire Fighting Emergency Activities	Wash Water from the Cleaning of Buildings	Dechlorinated backwash and draining associated with swimming pools

Table 3b: Types of Discharges that are not allowed to stormwater collection system

Dumping of oil, anti-freeze, paint, cleaning fluids	Commercial Car Wash	Industrial Discharges
Contaminated Foundation Drains	Cooling water unless no chemicals added and has NPDES permit	Washwaters from commercial / industrial activities
Sanitary Sewer Discharges	Septic Tank Discharges	Washing Machine Discharges
Chlorinated backwash and draining associated with swimming pools		

The legal authority for identifying, prohibiting, and removal of discharges not allowed to the stormwater collection system is contained in Chapter 17, Article VI of the Garner Town Code and is presented in Appendix E of this document.

3-B. Collecting Jurisdiction-Wide Information

In order to effectively implement an illegal discharge program the Town of Garner will collect and map certain geographical information. As required by the Neuse Stormwater Rule this information will be collected at three levels of detail on a specified time schedule. The levels along with associated time schedules are presented below. Also, these tasks and their implementation schedules are summarized in Table 3c.

- The first, most cursory level is information that shall be collected for the entire jurisdiction and the associated requirements for this level are discussed in this section. The collection of this information will be completed by the time the second annual report is due in October 2002.
- The second level is a more detailed mapping and screening for high priority areas within the jurisdiction. This detailed mapping and screening will begin in 2003 and will continue each year thereafter. The associated requirements are discussed in Section 3-C.
- The third level is a very detailed investigation that will be done upon the discovery of an illegal discharge. The timetable for this element goes hand in hand with the field screening effort. The associated requirements are discussed in Section 3-D.

Table 3c: Implementation Schedule and Annual Reporting Requirements

Year	Implementation Requirements	Annual Report Requirements
By February 2001	<ul style="list-style-type: none"> • Establish legal authority to address illegal discharges 	<ul style="list-style-type: none"> • Submit report identifying established legal authority to meet requirements.
By October 2002	<ul style="list-style-type: none"> • Collect jurisdiction-wide information. • Select high priority area for additional screening. • Initiate illegal discharge hotline. 	<ul style="list-style-type: none"> • Report on completion of jurisdiction-wide information collection. • Submit map of high priority areas and reason for selection. • Report on initiation of illegal discharge hotline.
Each subsequent year after 2002	<ul style="list-style-type: none"> • Complete mapping and field screening for high priority area. • Select next high priority area. • Identify and remove illegal discharges as encountered. • Continue operating illegal discharge hotline. 	<ul style="list-style-type: none"> • Submit map of stormwater collection system in high priority area upon request by DWQ. • Document illegal discharges found and resulting action. • Report on hotline usage and actions taken. • Submit map of next high priority area and reason for selection.

For the first level of data collection Garner will compile maps that show the information presented below. It is Garner's intent that all of this information will ultimately be on the Town's GIS system and, as such, can be displayed on one single map. However, in the short term some of this data may be displayed on existing maps that cannot be digitally reproduced. These maps will not be at a scale greater than 1:24,000. The GIS maps can be reproduced at any scale.

- Location of sanitary sewers in areas of the major stormwater collection systems and the location of areas that are not served by sanitary sewers.
- Waters that appear on the USDA B Natural Resources Conservation Service Soil Survey Maps and the U.S. Geological Survey 1:24,000 scale topographic maps.
- Existing land uses. Categories to be presented are: undeveloped, residential, commercial, agriculture, industrial, institutional, and publicly owned open space.
- Currently operating and known closed municipal landfills and other treatment, storage, and disposal facilities, including for hazardous materials.
- Major stormwater structural controls.
- Known NPDES permitted discharges to the stormwater collection system.

Written descriptions will be provided for the map components as follows:

- A summary table of municipal waste facilities that includes the names of the facilities, the status (open/closed), the types, and addresses.
- A summary table of the NPDES permitted dischargers that include the name of the permit holder, the address of the facility and permit number.
- A summary table of the major structural stormwater control structures that shows the type of structure, area served, party responsible for maintaining, and age of structure.
- A summary table of publicly owned open space that identifies size, location, and primary function of each open area.

3-C. Mapping and Field Screening in High Priority Areas

Beginning in 2003 Garner will identify a high priority area of its jurisdiction for more detailed mapping and field screening. This high priority area will comprise at least ten percent of the corporate limits and ETJ. Currently Garner's planning jurisdiction is just under 30 square miles in area. Each subsequent year another high priority area, comprised of at least ten percent of the corporate limits and ETJ, will be selected for field screening. Selection of the

high priority areas will be based upon several factors. It is anticipated that the manpower requirements will be greater within the more densely developed corporate limits than in the less populated ETJ area. As such, in order to distribute manpower requirements more evenly, it is anticipated that about one half of the area to be screened each year will be within the corporate limits and the other half will be out in the ETJ. This ratio may be subject to change if during the mapping and data collection phase it is discovered that more attention needs to be focused on either the corporate limits area or the ETJ area. In order to promote an orderly and systematic field screening program it is not recommended that field screening be conducted all over the jurisdiction at the same time. Accordingly, each year's screening program will try to concentrate on specific drainage basins. It is also anticipated that the likelihood of illegal discharges occurring are greater in developments that were built prior to the installation of the sanitary sewer collection system. As such, within the corporate limits, the older parts of Town will likely be good candidates for early screening.

It should be recognized that the criteria for selecting high priority areas has been based upon certain assumptions. Once the field screening is underway it is possible that some of these assumptions are proven to be incorrect. It is also possible that it is discovered that some additional criteria needs to be considered when selecting the screening areas. As such, the selection process identified above may be subject to change.

The first part of the screening process for the selected high priority area will be to map the stormwater system. The map that is produced will include the following:

- Locations of the outfalls of any pipes from non-industrial areas that are greater than or equal to 36 inches.
- Locations of the outfalls of any pipes from industrial areas that are greater than or equal to 12 inches.
- Locations of drainage ditches that drain more than 50 acres of non-industrial lands.
- Locations of drainage ditches that drain more than 2 acres of industrial land.
- An accompanying summary table listing the outfalls that meet the above criteria that includes outfall ID numbers, location, primary and supplemental classification of receiving water, and use-support of receiving water.

The second part of the screening process for the selected high priority area is conducting a dry weather field screening of all outfalls that meet the above criteria to detect illegal discharges. The dry weather field screening will not be conducted during or within 72 hours following a rain event of 0.1 inches or greater. In addition, in residential areas field screening will be conducted prior to 9:00 AM or after 5:00 PM. It is during these time periods when residents are most likely to be home and thus any illegal discharges are more likely to be evident.

Figure 3a illustrates the process that will be used for conducting field screening sampling activities and following up with any findings of dry weather flow. As shown in the figure, if the field screening shows that an outfall is dry, then the outfall will be checked for intermittent flow at a later date.

If the field screening shows that an outfall has a dry weather flow that is not allowable (see Table 3b), then a screening report for the outfall will be completed. Prior to implementing the field screening portion of the program in 2003 a screening report form will be developed. This form will be designed to allow the information presented in Table 3d to be recorded. It is also proposed that this form will be linked to the Town’s GIS system so that queries of the information can be made and the geographical location of all illegal discharges can be visually displayed. Screening reports, along with the associated documentation described in the following section, will be kept on file for a minimum of five years.

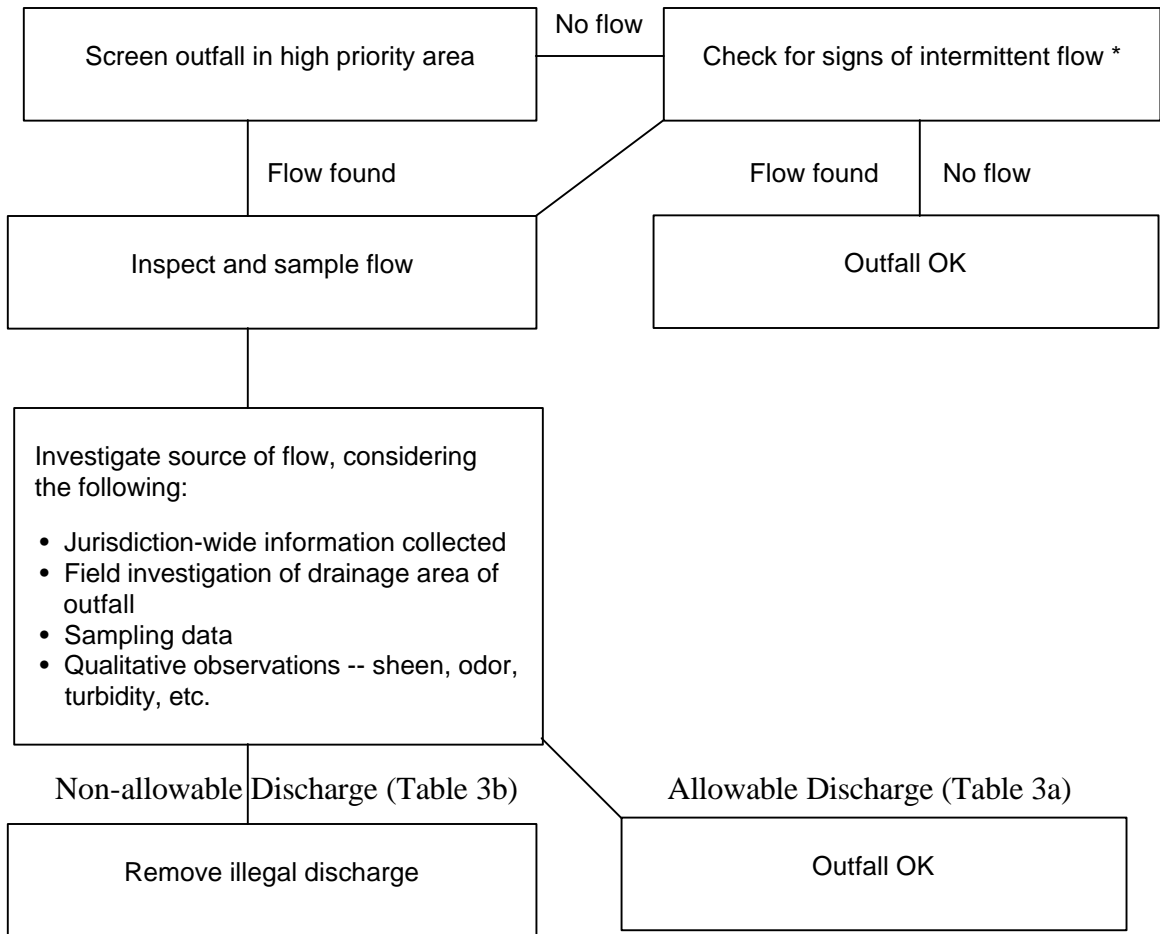
Table 3d: Field Screening Report Information

General Information	Sheet Number Outfall ID Number Date Time Date, Time and Quantity of Last Rainfall Event	
Field Site Description	Location Type of Outfall Dominant Watershed Land Use(s)	
Visual Observations	Photograph Odor Color Clarity Floatables	Deposits/Stains Vegetation Condition Structural Condition Biological Flow Estimation
Sampling Analysis *	Temperature pH Nitrogen-Ammonia	Nitrogen-Nitrate/Nitrite Fluoride or Chlorine

* Analytical monitoring is required only if an obvious source of the dry weather flow cannot be determined through an investigation of the upstream stormwater collection system.

Outfalls with flow will be screened again within 24 hours for the above parameters.

Figure 3a: Field Screening Process



* Checking for intermittent flow includes rechecking outfall at a later date as well as visual observations for evidence of intermittent flow.

Note: Analytical monitoring is required only if an obvious source of the dry weather flow cannot be determined through an investigation of the upstream stormwater collection system.

The purpose of the field screening is to provide clues as to the source of the illegal discharge. The characterization will be used in conjunction with the jurisdiction-wide information and a field investigation to identify the source of the illegal discharge. The process of identifying and removing illegal discharges is discussed in the next section.

3-D. Identifying and Removing Illegal Discharges

After the field screening is complete, appropriate measures will be taken to identify and remove illegal discharges. Identifying illegal discharges may require a combination of office and field work. After the field screening has identified that an illegal discharge may be occurring the jurisdiction-wide information developed in Section 3-B will be reviewed to help identify potential sources of the discharge. After potential sources have been identified a systematic field investigation will be undertaken to try to identify the actual source of the illegal discharge. Several field methods which may be used to identify illegal discharges are as follows:

- Site Investigation
- Additional Chemical Analysis (recommend testing for fecal coliform if the ammonia concentration was found to exceed 1.0 mg/L)
- Flow Monitoring (recommended to use multiple site visits rather than a depth indicator)
- Dye Testing (fluorescent dye is recommended)

Documentation of the results of the office and field investigations will be kept on file with the screening report.

Once the source of an illegal discharge is identified, enforcement action will be undertaken to have the source removed. The enforcement action process along with remedies to deal with cases of non-compliance are contained in Chapter 17, Article VI of the Garner Town Code and are presented in Appendix E of this document. Records of all compliance action will be kept with the screening report.

In addition to maintaining all screening reports on file the screening reports will be used to develop and maintain a map that includes the following information.

- Points of identified illegal discharges.
- Watershed boundaries of the outfalls where illegal discharges have been identified.
- An accompanying table that summarizes the illegal discharges that have been identified that includes location, a description of pollutant(s) identified, and removal status.

3-E. Preventing Discharges and Establishing a Hotline

In an effort to aid with the prevention and removal of illegal discharges the Town will contact businesses within the Town that, by the nature of their operation, have the potential to be a likely source of illegal discharges. A listing of the types of businesses that will be contacted along with a sample notification that may be used to inform owners and operators about the requirements of the illegal discharge program is presented in Appendix F.

The Neuse Stormwater Rules also require the Town to establish a hotline for reporting suspected illegal discharges. Due to the way the Town's telephone system is currently configured it is anticipated that a separate line with a designated phone number will be set up. Callers will phone in to an answering machine and a prerecorded message will provide them with instructions. If the illegal discharge is perceived to be an emergency the caller will be instructed to call the general Town Hall phone number during regular business hours or the existing Public Works emergency number after business hours and on weekends.

4. Retrofit Locations

4-A. Requirements in the Rule

In order to comply with the Neuse Stormwater Rules, Garner will establish a program to identify places within existing developed areas that are suitable for retrofits.

Retrofit opportunities will be considered acceptable if all of the following conditions have been investigated:

- The retrofit, if implemented, clearly has the potential to reduce nitrogen loading to the receiving water.
- The watershed is clearly contributing nitrogen loading above background levels.
- The landowner where the retrofit is proposed is willing to consider allowing the retrofit to be installed on his property.
- There is adequate space and access for the retrofit.
- It is technically practical to install a retrofit at that location.

Based upon our current population (less than 30,000) Garner must identify a minimum of two (2) retrofit sites each year. Sites may be carried over to meet the minimum requirement for up to two additional years provided that BMPs/retrofits have not been implemented and the site continues to meet the criteria above on an annual basis.

4-B. Data Collection and Notification

Each retrofit opportunity that is identified will be accompanied by information to describe the location of the retrofit, the type of retrofit being proposed, the property owner, as well as basic information about the watershed and the receiving water. A summary of the basic information to be provided with each retrofit opportunity is shown in Table 4a.

The retrofit opportunities identified will be submitted to the Division of Water Quality on October 30 of each year, beginning in 2001, as part of the annual report.

The Division will take the responsibility for posting these retrofit opportunities on its Web Page and also for notifying, at a minimum, the following organizations of the opportunities for retrofitting within existing developed areas:

- Clean Water Management Trust Fund
- N.C. State University Cooperative Extension Service
- Triangle J Council of Governments
- Kerr-Tar Council of Governments
- Eastern Carolina Council of Governments
- Environmental programs at N.C. State University, Duke University, University of N.C., East Carolina University and others
- N.C. Sea Grant
- USDA B Natural Resources Conservation Service
- Upper Neuse Basin Association
- Lower Neuse Basin Association
- N.C. Wetlands Restoration Program

Table 4a: Retrofit Opportunity Table

Location description, including directions from a major highway	
Type and description of retrofit opportunity	
Current property owner	
Is the property owner willing to cooperate?	
Land area available for retrofit (sq. ft)	
Accessibility to retrofit site	
Drainage area size (acres)	
Land use in drainage area (percent of each type of land use)	
Average slope in drainage area (%)	
Environmentally sensitive areas in drainage area (steep slopes, wetlands, riparian buffers, endangered/ threatened species habitat)	
Approximate annual nitrogen loading from drainage area (lbs/acre/year) *	
Potential nitrogen reduction (lbs/ac/yr)	
Estimated cost of retrofit	
Receiving water	
DWQ classification of receiving water	
Use support rating for receiving water	
Other important information	

* Suggested methodology: Use Figure 2b from Chapter 2 to compute nitrogen export from the drainage area based on the amount of impervious surface, landscaped area and forested area in the watershed.

4-C. Mapping Requirements

The Town of Garner will develop and maintain a map that shows the locations of retrofit opportunities. The following information will be shown on the maps.

- Drainage area to retrofit opportunity site.
- Land uses within the drainage area.
- Location of retrofit opportunity.
- Property boundaries in the vicinity of the retrofit opportunity.
- Significant hydrography (as depicted on U.S.G.S. topographic maps and USDA-NRCS Soil Survey maps).
- Roads.
- Environmentally sensitive areas (steep slopes, wetlands, riparian buffers, endangered/threatened species habitat B where available).
- Publicly owned parks, recreational areas, and other open lands.

5. Public Education

5-A. Requirements in the Rule

The Neuse Stormwater Rule requires that a Public Education Action Plan be developed and administered as a part of Garner’s plan. The purpose of this education program is to address nitrogen loading issues.

5-B. Public Education Action Plan

The Education Action Plan must consist of at least two of the activities from each of the two categories listed in Table 5a. These activities will be designed to raise awareness and educate the audience about water quality, nonpoint source pollution, and the effects of everyday activities on water quality and nutrient loading. In lieu of these activities Garner, in cooperation with other affected local governments, may choose to use effective major media advertising to satisfy the public education requirements. In addition to these activities, two technical workshops will be conducted in the first year and a toll free hotline for reporting illegal discharges will be established.

Table 5a: Public Education Action Plan Categories

Category 1	Category 2
Demonstration Sites (for Best Management Practices)	Fact Sheets
“Adopt-a-Program”	Environmental Freebies
Quarterly local newspaper articles	Fertilizer Tags
Storm drain marking	Flyers
Recognition Program (recognize environment friendly participants)	Postmarks
Web page	Utility bills inserts
Local Cable TV program	Close-out Packages (new homeowners)
Toll free hotline for reporting environmental problems	Speak to civic organizations quarterly
Environmental field day	
Technical Workshop (only applicable after 1 st year)	
Environmental Contest	

As previously mentioned, during the first year of program implementation, Garner is required to conduct two (2) technical workshops. One shall be designed to educate local government officials and staff and the other for the development community, including: engineers, developers, architects, contractors, surveyors, planners, and realtors. During subsequent years, technical workshops are considered an option under Category 2 activities. Hopefully these workshops can be developed and conducted jointly with the other triangle communities affected by this rule.

As with the workshops, Garner would like to work with other affected communities to share and make use of existing education resources and to jointly conduct some of the education efforts. It is felt that working together will provide a more consistent education effort for communities of all sizes, will be an efficient use of resources, and will reduce duplication of efforts.

6. Reporting Requirements

An annual Neuse River Basin Stormwater Program report is required to be submitted to the Division of Water Quality by October 30 of each year beginning in 2001. A summary of the information that will be included in the report is presented below.

6-A. New Development Review/Approval

A summary of the new development that has occurred in the previous year will be submitted as part of the annual report. The information on new development to be reported is presented below:

- Acres of new development and impervious surface based on plan approvals.
- Summary of BMPs implemented and use of offset fees.
- Computed baseline and net change in nitrogen export from new development that year. (see Appendix G)
- Summary of maintenance activities conducted on BMPs.
- Summary of any BMP failures and how they were handled.
- Summary of results from jurisdictional review of planning issues.

6-B. Illegal Discharges

Table 6a outlines the annual reporting requirements for illegal discharges.

Table 6a: Implementation Schedule and Annual Reporting Requirements

Year	Implementation Requirements	Annual Report Requirements
By February 2001	<ul style="list-style-type: none"> • Establish legal authority to address illegal discharges. 	<ul style="list-style-type: none"> • Submit report identifying established legal authority to meet requirements.
By October 2002	<ul style="list-style-type: none"> • Collect jurisdiction-wide information. • Select high priority area for additional screening. • Initiate illegal discharge hotline. 	<ul style="list-style-type: none"> • Report on completion of jurisdiction-wide information collection. • Submit map of high priority areas and reason for selection. • Report on initiation of illegal discharge hotline.

Each subsequent year after 2002	<ul style="list-style-type: none"> • Complete mapping and field screening for high priority area. • Select next high priority area. • Identify and remove illegal discharges as encountered. • Continue operating illegal discharge hotline. 	<ul style="list-style-type: none"> • Submit map of stormwater collection system in high priority area upon request by DWQ. • Document illegal discharges found and resulting action. • Report on hotline usage and actions taken. • Submit map of next high priority area and reason for selection.
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6-C. Retrofit Locations

- Data on each retrofit opportunity (Table 4a or other equivalent format)
- Maps of potential retrofit sites as specified in Section 4-C, and
- The status of any retrofit efforts that have been undertaken within the jurisdiction.

6-D. Public Education

The Report will summarize the next years Action Plan and evaluate the implementation of the previous years Action Plan (if applicable). The report should include goals, activities completed, realized education program costs, explanation of experienced shortfalls and a plan as to how the Town will address shortfalls.

APPENDIX A - Unified Development Ordinance

ORDINANCE NO. (2001) 3006

AN ORDINANCE TO AMEND ORDINANCE NO. (1984) 1907 ENTITLED "THE GARNER LAND USE ORDINANCE FOR THE TOWN OF GARNER AND ITS EXTRATERRITORIAL JURISDICTION" REGARDING ESTABLISHING STORMWATER REQUIREMENTS FOR NITROGEN CONTROL

WHEREAS, The Garner Planning and Appearance Commission has recommended the amendments of Sections 253 through 257 of the Garner Land Use Ordinance; and,

WHEREAS, after due advertisement, the Garner Board of Aldermen held a public hearing thereon on January 2, 2001;

NOW, THEREFORE, BE IT ORDAINED by the Board of Aldermen of the Town of Garner that Ordinance No. (1984) 1907 entitled "Land Use Ordinance for the Town of Garner and its Extraterritorial Jurisdiction" is hereby amended as follows:

Section One. Amend Article XVI of the Garner Land Use Ordinance by renumbering existing Sections 253 through 257 respectively to Sections 254 through 258.

Section Two. Amend Section Article XVI of the Garner Land Use Ordinance entitled "Floodways, Floodplains, Drainage, and Erosion" by inserting a new Section 253 to read as follows:

Section 253. Stormwater Requirements for Nitrogen Control

All new development shall be meet the requirements of the "The Town of Garner Stormwater Program for Nitrogen Control" found in Appendix F of the Land Use Ordinance. The major requirements that must be met by new development, as contained in the stormwater program, are as follows:

- a) New development shall comply with the requirements for protecting and maintaining riparian buffers as specified in the Riparian Buffer Rule 15A NCAC 2B .0233.
- b) As required by the Neuse Stormwater Rule 15A NCAC 2B .0235 the nutrient load contributed by new development activities is limited to 3.6 pounds per acre per year (lbs/ac/yr) of nitrogen loading. Development shall have the option of partially offsetting projected nitrogen loads by funding wetland or riparian

area restoration through the North Carolina Wetland Restoration Program. However, the total nitrogen loading rate cannot exceed 6.0 lbs/ac/yr for residential development or 10.0 lbs/ac/yr for non-residential development. Best management practices (bmps) provided for in the stormwater program must be used to reduce nitrogen loading to the 6.0 and 10.0 limits and may be used to reduce nitrogen loading to the 3.6 limit. Maintenance of any bmps installed will be the responsibility of the development.

c) Except in certain situations, stormwater detention will be required on new development. The design standard for detention will be based upon peak flow reduction to predevelopment (existing) conditions for the 1, 10, 25, and in some cases, the 100 year return frequency storm events.

Section Three. Amend the Garner Land Use Ordinance to officially add the document entitled "The Town of Garner Stormwater Program for Nitrogen Control" as Appendix F to said Ordinance.

Section Four. That all ordinances or portions thereof in conflict with this ordinance are hereby repealed.

Section Five. This ordinance shall become effective upon adoption.

Duly adopted this 5th day of February, 2001.

APPENDIX B - Neuse Buffer Rules

1 15A NCAC 2B .0233 has been adopted as published in 14:4 NCR 287-301 as follows:

2
3 • 0233 NEUSE RIVER BASIN: NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
4 PROTECTION AND MAINTENANCE OF EXISTING RIPARIAN BUFFERS

5 The following is the management strategy for maintaining and protecting existing riparian buffers in the Neuse
6 River Basin.

7 (1) PURPOSE. The purpose of this Rule shall be to protect and preserve existing riparian buffers in the
8 Neuse River Basin to maintain their nutrient removal functions.

9 (2) DEFINITIONS. For the purpose of this Rule, these terms shall be defined as follows:

10 (a) 'Channel' means a natural water-carrying trough cut vertically into low areas of the land surface by
11 erosive action of concentrated flowing water or a ditch or canal excavated for the flow of water.

12 (current definition in Forest Practice Guidelines Related to Water Quality, 15A NCAC 11 .0 102)

13 (b) 'DBH' means Diameter at Breast Height of a tree, which is measured at 4.5 feet above ground
14 surface level.

15 (c) 'Ditch or canal' means a man-made channel other than a modified natural stream constructed for
16 drainage purposes that is typically dug through inter-stream divide areas. A ditch or canal may have
17 flows that are perennial, intermittent, or ephemeral and may exhibit hydrological and biological
18 characteristics similar to perennial or intermittent streams.

19 (d) 'Ephemeral (stormwater) stream' means a feature that carries only stormwater in direct response to
20 precipitation with water flowing only during and shortly after large precipitation events. An
21 ephemeral stream may or may not have a well-defined channel, the aquatic bed is always above the
22 water table, and stormwater runoff is the primary source of water. An ephemeral stream typically
23 lacks the biological, hydrological, and physical characteristics commonly associated with the
24 continuous or intermittent conveyance of water.

25 (e) 'Forest plantation' means an area of planted trees that may be conifers (pines) or hardwoods. On a
26 plantation, the intended crop trees are planted rather than naturally regenerated from seed on the
27 site, coppice (sprouting), or seed that is blown or carried into the site.

28 (f) 'High Value Tree' means a tree that meets or exceeds the following standards: for pine species, 14-
29 inch DBH or greater or 18-inch or greater stump diameter; and, for hardwoods and wetland species,
30 16-inch DBH or greater or 24-inch or greater stump diameter.

31 (g) 'Intermittent stream' means a well-defined channel that contains water for only part of the year,
32 typically during winter and spring when the aquatic bed is below the water table. The flow may be
33 heavily supplemented by stormwater runoff. An intermittent stream often lacks the biological and
34 hydrological characteristics commonly associated with the conveyance of water.

35 (h) 'Modified natural stream' means an on-site channelization or relocation of a stream channel and

1 subsequent relocation of the intermittent or perennial flow as evidenced by topographic alterations
2 in the immediate watershed. A modified natural stream must have the typical biological,
3 hydrological, and physical characteristics commonly associated with the continuous conveyance of
4 water.

5 (i) 'Perennial stream' means a well-defined channel that contains water year round during a year of
6 normal rainfall with the aquatic bed located below the water table for most of the year.
7 Groundwater is the primary source of water for a perennial stream, but it also carries stormwater
8 runoff. A perennial stream exhibits the typical biological, hydrological, and physical characteristics
9 commonly associated with the continuous conveyance of water.

10 (j) 'Perennial waterbody' means a natural or man-made basin that stores surface water permanently at
11 depths sufficient to preclude growth of rooted plants, including lakes, ponds, sounds, non-stream
12 estuaries and ocean. For the purpose of the State's riparian buffer protection program, the
13 waterbody must be part of a natural drainageway (i.e., connected by surface flow to a stream).

14 (k) 'Stream' means a body of concentrated flowing water in a natural low area or natural channel on the
15 land surface.

16 (l) 'Surface water' means all waters of the state as defined in G.S. 143-212 except underground waters.

17 (m) 'Tree' means a woody plant with a DBH equal to or exceeding five inches.

18 (3) **APPLICABILITY.** This Rule shall apply to 50-foot wide riparian buffers directly adjacent to surface
19 waters in the Neuse River Basin (intermittent streams, perennial streams, lakes, ponds, and estuaries),
20 excluding wetlands. Except as described in Sub-Item (4)(a)(iii) of this Rule, wetlands adjacent to surface
21 waters or within 50 feet of surface waters shall be considered as part of the riparian buffer but are
22 regulated pursuant to 15A NCAC 2H.0506. The riparian buffers protected by this Rule shall be measured
23 pursuant to Item (4) of this Rule. For the purpose of this Rule, a surface water shall be present if the
24 feature is approximately shown on either the most recent version of the soil survey map prepared by the
25 Natural Resources Conservation Service of the United States Department of Agriculture or the most recent
26 version of the 1:24,000 scale (7.5 minute) quadrangle topographic maps prepared by the United States
27 Geologic Survey (USGS). Riparian buffers adjacent to surface waters that do not appear on either of the
28 maps shall not be subject to this Rule. Riparian buffers adjacent to surface waters that appear on the maps
29 shall be subject to this Rule unless one of the following applies.

30 (a) **EXEMPTION WHEN AN ON-SITE DETERMINATION SHOWS THAT SURFACE WATERS**
31 **ARE NOT PRESENT.** When a landowner or other affected party believes that the maps have
32 inaccurately depicted surface waters, he or she shall consult the Division or the appropriate
33 delegated local authority. Upon request, the Division or delegated local authority shall make on-site
34 determinations. Any disputes over on-site determinations shall be referred to the Director in writing.
35 A determination of the Director as to the accuracy or application of the maps is subject to review as

1 provided in Articles 3 and 4 of G. S. 150B. Surface waters that appear on the maps shall not be
2 subject to this Rule if an on-site determination shows that they fall into one of the following
3 categories.

4 (i) Ditches and manmade conveyances other than modified natural streams unless constructed
5 for navigation or boat access.

6 (ii) Manmade ponds and lakes that are located outside natural drainage ways.

7 (iii) Ephemeral (stormwater) streams.

8 (b) EXEMPTION WHEN EXISTING USES ARE PRESENT AND ONGOING. This Rule shall not
9 apply to portions of the riparian buffer where a use is existing and ongoing according to the
10 following:

11 (i) A use shall be considered existing if it was present within the riparian buffer as of July 22,
12 1997. Existing uses shall include, but not be limited to, agriculture, buildings, industrial
13 facilities, commercial areas, transportation facilities, maintained lawns, utility lines and on-
14 site sanitary sewage systems. Only the portion of the riparian buffer that contains the
15 footprint of the existing use is exempt from this Rule. Activities necessary to maintain uses
16 are allowed provided that no additional vegetation is removed from Zone I except that
17 grazed or trampled by livestock and existing diffuse flow is maintained. Grading and
18 revegetating Zone 2 is allowed provided that the health of the vegetation in Zone I is not
19 compromised, the ground is stabilized and existing diffuse flow is maintained.

20 (ii) At the time an existing use is proposed to be converted to another use, this Rule shall apply.
21 An existing use shall be considered to be converted to another use if any of the following
22 applies:

23 (A) Impervious surface is added to the riparian buffer in locations where it did not exist
24 previously.

25 (B) An agricultural operation within the riparian buffer is converted to a non-agricultural
26 use.

27 (C) A lawn within the riparian buffer ceases to be maintained.

28 (4) ZONES OF THE RIPARIAN BUFFER. The protected riparian buffer shall have two zones as follows:

29 (a) Zone I shall consist of a vegetated area that is undisturbed except for uses provided for in Item (6)
30 of this Rule. The location of Zone I shall be as follows:

31 (i) For intermittent and perennial streams, Zone I shall begin at the most landward limit of the
32 top of bank or the rooted herbaceous vegetation and extend landward a distance of 30 feet on
33 all sides of the surface water, measured horizontally on a line perpendicular to the surface
34 water.

35 (ii) For ponds, lakes and reservoirs located within a natural drainage way, Zone I shall begin at

1 the most landward limit of the normal water level or the rooted herbaceous vegetation and
2 extend landward a distance of 30 feet, measured horizontally on a line perpendicular to the
3 surface water.

4 (iii) For surface waters within the 20 Coastal Counties (defined in 15A NCAC 2B .0202) within
5 the jurisdiction of the Division of Coastal Management, Zone I shall begin at the most
6 landward limit of the following options, whichever is more restrictive, and extend landward a
7 distance of 30 feet, measured horizontally on a line perpendicular to the surface water:

8 (A) the normal high water level;

9 (B) the normal water level; or

10 (C) the landward limit of coastal wetlands as defined by the Division of Coastal
11 Management.

12 (b) Zone 2 shall consist of a stable, vegetated area that is undisturbed except for activities and uses
13 provided for in Item (6) of this Rule. Grading and revegetating Zone 2 is allowed provided that the
14 health of the vegetation in Zone I is not compromised. Zone 2 shall begin at the outer edge of Zone
15 I and extend landward 20 feet as measured horizontally on a line perpendicular to the surface water.

16 The combined width of Zones I and 2 shall be 50 feet on all sides of the surface water.

17 (5) **DIFFUSE FLOW REQUIREMENT.** Diffuse flow of runoff shall be maintained in the riparian buffer by
18 dispersing concentrated flow and reestablishing vegetation.

19 (a) Concentrated runoff from new ditches or manmade conveyances shall be converted to diffuse flow
20 before the runoff enters Zone 2 of the riparian buffer.

21 (b) Periodic corrective action to restore diffuse flow shall be taken if necessary to impede the formation
22 of erosion gullies.

23

1 (6)TABLE OF USES. The following chart sets out the uses and their designation under this Rule as exempt,
 2 allowable, allowable with mitigation, or prohibited. The requirements for each category are given in Item
 3 (7) of this Rule.

	Exempt	Allowable	Allowable with Mitigation	Prohibited
Airport facilities: <ul style="list-style-type: none"> • Airport facilities that impact equal to or less than 150 linear feet or one-third of an acre of riparian buffer • Airport facilities that impact greater than 150 linear feet or one-third of an acre of riparian buffer 		X	X	
Archaeological activities	X			
Bridges		X		
Dam maintenance activities	X			

I

	Exempt	Allowable	Allowable with Mitigation	Prohibited
<p>Drainage ditches, roadside ditches and stormwater outfalls through riparian buffers:</p> <ul style="list-style-type: none"> • Existing drainage ditches, roadside ditches, and stormwater outfalls provided that they are managed to minimize the sediment, nutrients and other pollution that convey to waterbodies • New drainage ditches, roadside ditches and stormwater outfalls provided that a stormwater management facility is installed to control nitrogen and attenuate flow before the conveyance discharges through the riparian buffer • New drainage ditches, roadside ditches and stormwater outfalls that do not provide control for nitrogen before discharging through the riparian buffer • Excavation of the streambed in order to bring it to the same elevation as the invert of a ditch 	X	X		X X
<p>Drainage of a pond in a natural drainage way provided that a new riparian buffer that meets the requirements of Items (4) and (5) of this Rule is established adjacent to the new</p>	X			
<p>Driveway crossings of streams and other surface waters subject to this Rule:</p> <ul style="list-style-type: none"> • Driveway crossings on single family residential lots that disturb equal to or less than 25 linear feet or 2,500 square feet of riparian buffer • Driveway crossings on single family residential lots that disturb greater than 25 linear feet or 2,500 square feet of riparian buffer • In a subdivision that cumulatively disturb equal to or less than 150 linear feet or one-third of an acre of riparian buffer • In a subdivision that cumulatively disturb greater than 150 linear feet or one-third of an acre of riparian buffer 	X	X X	X	

I

	Exempt	Allowable	<u>Allowable with Mitigation</u>	Prohibited
Fences provided that disturbance is minimized and installation does not result in removal of forest vegetation	X			
Forest harvesting - see Item (I 1) of this Rule				
Fertilizer application: <ul style="list-style-type: none"> • One-time fertilizer application to establish replanted vegetation • Ongoing fertilizer application 	X			X
Grading and revegetation in Zone 2 only provided that diffuse flow and the health of existing vegetation in Zone I is not compromised and disturbed areas are stabilized	X			
Greenway / hiking trails		X		
Historic preservation	X			
Landfills as defined by G.S. 130A-290.				X
Mining activities: <ul style="list-style-type: none"> • Mining activities that are covered by the Mining Act provided that new riparian buffers that meet the requirements of Items (4) and (5) of this Rule are established adjacent to the relocated channels • Mining activities that are not covered by the Mining Act OR where new riparian buffers that meet the requirements of Items (4) and (5) of this Rule are not established adjacent to the relocated channels • Wastewater or mining dewatering wells with approved NPDES permit 	X	X	X	

I

	Exempt	Allowable	Allowable with Mitigation	Prohibited
Non-electric utility lines: <ul style="list-style-type: none"> • Impacts other than perpendicular crossings in Zone 2 only ³ • Impacts other than perpendicular crossings in Zone 1 ³ 		X	X	
Non-electric utility line perpendicular crossings of streams and other surface waters subject to this Rule . <ul style="list-style-type: none"> • Perpendicular crossings that disturb equal to or less than 40 linear feet of riparian buffer with a maintenance corridor equal to or less than 10 feet in width • Perpendicular crossings that disturb equal to or less than 40 linear feet of riparian buffer with a maintenance corridor greater than 10 feet in width • Perpendicular crossings that disturb greater than 40 linear feet but equal to or less than 150 linear feet of riparian buffer with a maintenance corridor equal to or less than 10 feet in width • Perpendicular crossings that disturb greater than 40 linear feet but equal to or less than 150 linear feet of riparian buffer with a maintenance corridor greater than 10 feet in width • Perpendicular crossings that disturb greater than 150 linear feet of riparian buffer 	X	X X	X X	
On-site sanitary sewage systems - new ones that use ground absorption				X
Overhead electric utility lines: <ul style="list-style-type: none"> • Impacts other than perpendicular crossings in Zone 2 only ³ • Impacts other than perpendicular crossings in Zone 1 ^{1,2,3} 	X X			

	Exempt	Allowable	Allowable with Mitigation	Prohibited
Overhead electric utility line perpendicular crossings of streams and other surface waters subject to this Rule ³ . <ul style="list-style-type: none"> • Perpendicular crossings that disturb equal to or less than 150 linear feet of riparian buffer ¹ • Perpendicular crossings that disturb greater than 150 linear feet of riparian buffer ^{1,2} 	X	X		
Periodic maintenance of modified natural streams such as canals and a grassed travelway on one side of the surface water when alternative forms of maintenance access are not practical		X		

1 ¹ Provided that, in Zone 1, all of the following BMPs for overhead utility lines are used. If all of these BMPs are not
2 used, then the overhead utility lines shall require a no practical alternative evaluation by the Division.

- 3 • A minimum zone of 10 feet wide immediately adjacent to the water body shall be managed such that only
4 vegetation that poses a hazard or has the potential to grow tall enough to interfere with the line is removed.
- 5 • Woody vegetation shall be cleared by hand. No land grubbing or grading is allowed.
- 6 • Vegetative root systems shall be left intact to maintain the integrity of the soil. Stumps shall remain where trees
7 are cut.
- 8 • Rip rap shall not be used unless it is necessary to stabilize a tower.
- 9 • No fertilizer shall be used other than a one-time application to re-establish vegetation.
- 10 • Construction activities shall minimize the removal of woody vegetation, the extent of the disturbed area, and the
11 time in which areas remain in a disturbed state.
- 12 • Active measures shall be taken after construction and during routine maintenance to ensure diffuse flow of
13 stormwater through the buffer.
- 14 • In wetlands, mats shall be utilized to minimize soil disturbance.

15 ² Provided that poles or towers shall not be installed within 10 feet of a water body unless the Division completes a
16 no practical alternative evaluation.

17 ³ Perpendicular crossings are those that intersect the surface water at an angle between 75' and 105'.

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	Exempt	Allowable	Allowable with Mitigation	Prohibited
<p>Playground equipment:</p> <ul style="list-style-type: none"> • Playground equipment on single family lots provided that installation and use does not result in removal of vegetation • Playground equipment installed on lands other than single-family lots or that requires removal of vegetation 	X	X		
<p>Ponds in natural drainage ways, excluding dry ponds:</p> <ul style="list-style-type: none"> • New ponds provided that a riparian buffer that meets the requirements of Items (4) and (5) of this Rule is established adjacent to the pond • New ponds where a riparian buffer that meets the requirements of Items (4) and (5) of this Rule is NOT established adjacent to the pond 		X	X	
<p>Protection of existing structures, facilities and streambanks when this requires additional disturbance of the riparian buffer or the stream channel</p>		X		
<p>Railroad impacts other than crossings of streams and other surface waters subject to this Rule</p>			<u>X</u>	
<p>Railroad crossings of streams and other surface waters subject to this Rule:</p> <ul style="list-style-type: none"> • Railroad crossings that impact equal to or less than 40 linear feet of riparian buffer • Railroad crossings that impact greater than 40 linear feet but-equal to or less than 150 linear feet or one-third of an acre of riparian buffer • Railroad crossings that impact greater than 150 linear feet or one-third of an acre of riparian buffer 	X	X	X	

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	Exempt	Allowable	Allowable with Mitigation	Prohibited
Removal of previous fill or debris provided that diffuse flow is maintained and any vegetation removed is restored	X			
Road impacts other than crossings of streams and other surface waters subject to this Rule			X	
Road crossings of streams and other surface waters subject to this Rule: <ul style="list-style-type: none"> • Road crossings that impact equal to or less than 40 linear feet of riparian buffer • Road crossings that impact greater than 40 linear feet but equal to or less than 150 linear feet or one-third of an acre of riparian buffer • Road crossings that impact greater than 150 linear feet or one-third of an acre of riparian buffer 	X	X	X	
Scientific studies and stream gauging	X			
Stormwater management ponds excluding dry ponds: <ul style="list-style-type: none"> • New stormwater management ponds provided that a riparian buffer that meets the requirements of Items (4) and (5) of this Rule is established adjacent to the pond • New stormwater management ponds where a riparian buffer that meets the requirements of Items (4) and (5) of this Rule is NOT established adjacent to the pond 		X	X	
Stream restoration	X			
Streambank stabilization		X		

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	Exempt	Allowable	Allowable with Mitigation	Prohibited
<p>Temporary roads:</p> <ul style="list-style-type: none"> • Temporary roads that disturb less than or equal to 2,500 square feet provided that vegetation is restored within six months of initial disturbance • Temporary roads that disturb greater than 2,500 square feet provided that vegetation is restored within six months of initial disturbance • Temporary roads used for bridge construction or replacement provided that restoration activities, such as soil stabilization and revegetation, are conducted immediately after construction 	X	X		
<p>Temporary sediment and erosion control devices:</p> <ul style="list-style-type: none"> • In Zone 2 only provided that the vegetation in Zone I is not compromised and that discharge is released as diffuse flow in accordance with Item (5) of this Rule • In Zones I and 2 to control impacts associated with uses approved by the Division or that have received a variance provided that sediment and erosion control for upland areas is addressed to the maximum extent practical outside the buffer • In-stream temporary erosion and sediment control measures for work within a stream channel 	X	X		
<p>Underground electric utility lines:</p> <ul style="list-style-type: none"> • Impacts other than perpendicular crossings in Zone 2 only ³ • Impacts other than perpendicular crossings in Zone 1 ^{3,4} 	X			

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	Exempt	Allowable	Allowable with Mitigation	Prohibited
Underground electric utility line perpendicular crossings of streams and other surface waters subject to this Rule : <ul style="list-style-type: none"> • Perpendicular crossings that disturb less than or equal to 40 linear feet of riparian buffer ⁴ • Perpendicular crossings that disturb greater than 40 linear feet of riparian buffer ⁴ 	X	X		

2 ⁴ Provided that, in Zone 1, all of the following BMPs for underground utility lines are used. If all of these BMPs are
 3 not used, then the underground utility line shall require a no practical alternative evaluation by the Division.

- 4 • Woody vegetation shall be cleared by hand. No land grubbing or grading is allowed.
- 5 • Vegetative root systems shall be left intact to maintain the integrity of the soil. Stumps shall remain, except in the
- 6 trench, where trees are cut.
- 7 • Underground cables shall be installed by vibratory plow or trenching.
- 8 • The trench shall be backfilled with the excavated soil material immediately following cable installation.
- 9 • No fertilizer shall be used other than a one-time application to re-establish vegetation.
- 10 • Construction activities shall minimize the removal of woody vegetation, the extent of the disturbed area, and the
- 11 time in which areas remain in a disturbed state.
- 12 • Active measures shall be taken after construction and during routine maintenance to ensure diffuse flow of
- 13 stormwater through the buffer.
- 14 • In wetlands, mats shall be utilized to minimize soil disturbance.

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	Exempt	Allowable	Allowable with Mitigation	Prohibited
Vegetation management: <ul style="list-style-type: none"> • Emergency fire control measures provided that topography is restored • Periodic mowing and harvesting of plant products in Zone 2 only • Planting vegetation to enhance the riparian buffer • Pruning forest vegetation provided that the health and function of the forest vegetation is not compromised • Removal of individual trees which are in danger of causing damage to dwellings, other structures or human life • Removal of poison ivy • Removal of understory nuisance vegetation as defined in: Smith, Cherri L. 1998. Exotic Plant Guidelines. Department of Environment and Natural Resources. Division of Parks and Recreation. Raleigh, NC. Guideline #30 	X X X X X X X			
Water dependent structures as defined in 15A NCAC 2B .0202		X		
Water supply reservoirs: <ul style="list-style-type: none"> • New reservoirs provided that a riparian buffer that meets the requirements of Items (4) and (5) of this Rule is established adjacent to the reservoir • New reservoirs where a riparian buffer that meets the requirements of Items (4) and (5) of this Rule is NOT established adjacent to the reservoir 		X	X	
Water wells	X			
Wetland restoration	X			

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(7) REQUIREMENTS FOR CATEGORIES OF USES. Uses designated as exempt, allowable, allowable

1 with mitigation and prohibited in Item (6) of this Rule shall have the following requirements:

- 2 (a) **EXEMPT.** Uses designated as exempt are allowed within the riparian buffer. Exempt uses shall be
3 designed, constructed and maintained to minimize soil disturbance and to provide the maximum
4 water quality protection practicable. In addition, exempt uses shall meet requirements listed in Item
5 (6) of this Rule for the specific use.
- 6 (b) **ALLOWABLE.** Uses designated as allowable may proceed within the riparian buffer provided that
7 there are no practical alternatives to the requested use pursuant to Item (8) of this Rule. These uses
8 require written authorization from the Division or the delegated local authority.
- 9 (c) **ALLOWABLE WITH MITIGATION.** Uses designated as allowable with mitigation may proceed
10 within the riparian buffer provided that there are no practical alternatives to the requested use
11 pursuant to Item (8) of this Rule and an appropriate mitigation strategy has been approved pursuant
12 to Item (10) of this Rule. These uses require written authorization from the Division or the
13 delegated local authority.
- 14 (d) **PROHIBITED.** Uses designated as prohibited may not proceed within the riparian buffer unless a
15 variance is granted pursuant to Item (9) of this Rule. Mitigation may be required as one condition
16 of a variance approval.

17 (8) **DETERMINATION OF "NO PRACTICAL ALTERNATIVES."** Persons who wish to undertake uses
18 designated as allowable or allowable with mitigation shall submit a request for a "no practical alternatives"
19 determination to the Division or to the delegated local authority. The applicant shall certify that the
20 criteria identified in Sub-Item (8)(a) of this Rule are met. The Division or the delegated local authority
21 shall grant an Authorization Certificate upon a "no practical alternatives" determination. The procedure
22 for making an Authorization Certificate shall be as follows:

- 23 (a) For any request for an Authorization Certificate, the Division or the delegated local authority shall
24 review the entire project and make a finding of fact as to whether the following requirements have
25 been met in support of a "no practical alternatives" determination:
- 26 (i) The basic project purpose cannot be practically accomplished in a manner that would better
27 minimize disturbance, preserve aquatic life and habitat, and protect water quality.
- 28 (ii) The use cannot practically be reduced in size or density, reconfigured or redesigned to better
29 minimize disturbance, preserve aquatic life and habitat, and protect water quality.
- 30 (iii) Best management practices shall be used if necessary to minimize disturbance, preserve
31 aquatic life and habitat, and protect water quality.
- 32 (b) Requests for an Authorization Certificate shall be reviewed and either approved or denied within 60
33 days of receipt of a complete submission based on the criteria in Sub-Item (8)(a) of this Rule by
34 either the Division or the delegated local authority. Failure to issue an approval or denial within 60
35 days shall constitute that the applicant has demonstrated "no practical alternatives." The Division

1 or the delegated local authority may attach conditions to the Authorization Certificate that support
2 the purpose, spirit and intent of the riparian buffer protection program. Complete submissions shall
3 include the following:

- 4 G) The name, address and phone number of the applicant;
- 5 (ii) The nature of the activity to be conducted by the applicant;
- 6 (iii) The location of the activity, including the jurisdiction;
- 7 (iv) A map of sufficient detail to accurately delineate the boundaries of the land to be utilized in
8 carrying out the activity, the location and dimensions of any disturbance in riparian buffers
9 associated with the activity, and the extent of riparian buffers on the land;
- 10 (v) An explanation of why this plan for the activity cannot be practically accomplished, reduced
11 or reconfigured to better minimize disturbance to the riparian buffer, preserve aquatic life
12 and habitat and protect water quality; and
- 13 (vi) Plans for any best management practices proposed to be used to control the impacts
14 associated with the activity.

15 (c) Any disputes over determinations regarding Authorization Certificates shall be referred to the
16 Director for a decision. The Director's decision is subject to review as provided in Articles 3 and 4
17 of G. S. 150B.

18 (9) VARIANCES. Persons who wish to undertake uses designated as prohibited may pursue a variance. The
19 Division or the appropriate delegated local authority may grant minor variances. The variance request
20 procedure shall be as follows:

21 (a) For any variance request, the Division or the delegated local authority shall make a finding of fact
22 as to whether the following requirements have been met:

23 G) There are practical difficulties or unnecessary hardships that prevent compliance with the
24 strict letter of the riparian buffer protection requirements. Practical difficulties or
25 unnecessary hardships shall be evaluated in accordance with the following:

26 (A) If the applicant complies with the provisions of this Rule, he/she can secure no
27 reasonable return from, nor make reasonable use of, his/her property. Merely proving
28 that the variance would permit a greater profit from the property shall not be
29 considered adequate justification for a variance. Moreover, the Division or delegated
30 local authority shall consider whether the variance is the minimum possible deviation
31 from the terms of this Rule that shall make reasonable use of the property possible.

32 (B) The hardship results from application of this Rule to the property rather than from
33 other factors such as deed restrictions or other hardship.

34 (C) The hardship is due to the physical nature of the applicant's property, such as its size,
35 shape, or topography, which is different from that of neighboring property.

- 1 (D) The applicant did not cause the hardship by knowingly or unknowingly violating this
2 Rule.
- 3 (E) The applicant did not purchase the property after the effective date of this Rule, and
4 then requesting an appeal.
- 5 (F) The hardship is unique to the applicant's property, rather than the result of conditions
6 that are widespread. If other properties are equally subject to the hardship created in
7 the restriction, then granting a variance would be a special privilege denied to others,
8 and would not promote equal justice.
- 9 (ii) The variance is in harmony with the general purpose and intent of the State's riparian buffer
10 protection requirements and preserves its spirit; and
- 11 (iii) In granting the variance, the public safety and welfare have been assured, water quality has
12 been protected, and substantial justice has been done.
- 13 (b) **MINOR VARIANCES.** A minor variance request pertains to activities that are proposed only to
14 impact any portion of Zone 2 of the riparian buffer. Minor variance requests shall be reviewed and
15 approved based on the criteria in Sub-Item (9)(a) of this Rule by the either the Division or the
16 delegated local authority pursuant to G.S. 153A-Article 18, or G.S. 160A-Article 19. The Division
17 or the delegated local authority may attach conditions to the variance approval that support the
18 purpose, spirit and intent of the riparian buffer protection program. Requests for appeals of
19 decisions made by the Division shall be made to the Office of Administrative Hearings. Request for
20 appeals made by the delegated local authority shall be made to the appropriate Board of Adjustment
21 under G.S. 160A-388 or G.S. 153A-345.
- 22 (c) **MAJOR VARIANCES.** A major variance request pertains to activities that are proposed to impact
23 any portion of Zone I or any portion of both Zones I and 2 of the riparian buffer. If the Division or
24 the delegated local authority has determined that a major variance request meets the requirements in
25 Sub-Item (9)(a) of this Rule, then it shall prepare a preliminary finding and submit it to the
26 Commission. Preliminary findings on major variance requests shall be reviewed by the
27 Commission within 90 days after receipt by the Director. Requests for appeals of determinations
28 that the requirements of Sub-Item (9)(a) of this Rule have not been met shall be made to the Office
29 of Administrative Hearings for determinations made by the Division or the appropriate Board of
30 Adjustments under G.S. 160A-388 or G.S. 153A-345 for determinations made by the delegated
31 local authority. The purpose of the Commission's review is to determine if it agrees that the
32 requirements in Sub-Item (9)(a) of this Rule have been met. Requests for appeals of decisions made
33 by the Commission shall be made to the Office of Administrative Hearings. The following actions
34 shall be taken depending on the Commission's decision on the major variance request:
- 35 G) Upon the Commission's approval, the Division or the delegated local authority shall issue a

1 final decision granting the major variance.

2 (ii) Upon the Commission's approval with conditions or stipulations, the Division or the
3 delegated local authority shall issue a final decision, which includes these conditions or
4 stipulations.

5 (iii) Upon the Commission's denial, the Division or the delegated local authority shall issue a
6 final decision denying the major variance.

7 (10) MITIGATION. Persons who wish to undertake uses designated as allowable with mitigation shall meet the
8 following requirements in order to proceed with their proposed use.

9 (a) Obtain a determination of "no practical alternatives" to the proposed use pursuant to Item (8) of this
10 Rule.

11 (b) Obtain approval for a mitigation proposal pursuant to 15A NCAC 2B .0242.

12 (I 1) REQUIREMENTS SPECIFIC TO FOREST HARVESTING. The following requirements shall apply for
13 forest harvesting operations and practices.

14 (a) The following measures shall apply in the entire riparian buffer:

15 (i) Logging decks and sawmill sites shall not be placed in the riparian buffer.

16 (ii) Access roads and skid trails shall be prohibited except for temporary and permanent stream
17 crossings established in accordance with 15A NCAC 11 .0203. Temporary stream crossings
18 shall be permanently stabilized after any site disturbing activity is completed.

19 (iii) Timber felling shall be directed away from the stream or water body.

20 (iv) Skidding shall be directed away from the stream or water body and shall be done in a manner
21 that minimizes soil disturbance and prevents the creation of channels or ruts.

22 (v) Individual trees may be treated to maintain or improve their health, form or vigor.

23 (vi) Harvesting of dead or infected trees or application of pesticides necessary to prevent or
24 control extensive tree pest and disease infestation shall be allowed. These practices must be
25 approved by the Division of Forest Resources for a specific site. The Division of Forest
26 Resources must notify the Division of all approvals.

27 (vii) Removal of individual trees that are in danger of causing damage to structures or human life
28 shall be allowed.

29 (viii) Natural regeneration of forest vegetation and planting of trees, shrubs, or ground cover plants
30 to enhance the riparian buffer shall be allowed provided that soil disturbance is minimized.
31 Plantings shall consist primarily of native species.

32 (ix) High intensity prescribed burns shall not be allowed.

33 W Application of fertilizer shall not be allowed except as necessary for permanent stabilization.

34 Broadcast application of fertilizer or herbicides to the adjacent forest stand shall be
35 conducted so that the chemicals are not applied directly to or allowed to drift into the riparian

1 buffer.

2 (b) In Zone 1, forest vegetation shall be protected and maintained. Selective harvest as provided for
3 below is allowed on forest lands that have a deferment for use value under forestry in accordance
4 with G.S. 105-277.2 through 277.6 or on forest lands that have a forest management plan prepared
5 or approved by a registered professional forester. Copies of either the approval of the deferment for
6 use value under forestry or the forest management plan shall be produced upon request. For such
7 forest lands, selective harvest is allowed in accordance with the following:

8 (G) Tracked or wheeled vehicles are not permitted except at stream crossings designed,
9 constructed and maintained in accordance with 15A NCAC 11 .0203.

10 (ii) Soil disturbing site preparation activities are not allowed.

11 (iii) Trees shall be removed with the minimum disturbance to the soil and residual vegetation.

12 (iv) The following provisions for selective harvesting shall be met:

13 (A) The first 10 feet of Zone I directly adjacent to the stream or waterbody shall be
14 undisturbed except for the removal of individual high value trees as defined provided
15 that no trees with exposed primary roots visible in the streambank be cut.

16 (B) In the outer 20 feet of Zone 1, a maximum of 50 percent of the trees greater than five
17 inches dbh may be cut and removed. The reentry time for harvest shall be no more
18 frequent than every 15 years, except on forest plantations where the reentry time shall
19 be no more frequent than every five years. In either case, the trees remaining after
20 harvest shall be as evenly spaced as possible.

21 (C) In Zone 2, harvesting and regeneration of the forest stand shall be allowed provided
22 that sufficient ground cover is maintained to provide for diffusion and infiltration of
23 surface runoff.

24 (12) REQUIREMENTS SPECIFIC TO LOCAL GOVERNMENTS WITH STORMWATER PROGRAMS
25 FOR NITROGEN CONTROL. Local governments that are required to have local stormwater programs
26 pursuant to 15A NCAC 2B .0235 shall have two options for ensuring protection of riparian buffers on new
27 developments within their jurisdictions as follows.

28 (a) Obtain authority to implement a local riparian buffer protection program pursuant to 15A NCAC 2B
29 .0241.

30 (b) Refrain from issuing local approvals for new development projects unless either:

31 (i) The person requesting the approval does not propose to impact the riparian buffer of a
32 surface water that appears on either the most recent versions of the soil survey maps prepared
33 by the Natural Resources Conservation Service of the United States Department of
34 Agriculture or the most recent versions of the 1:24,000 scale (7.5 minute quadrangle)
35 topographic maps prepared by the United States Geologic Survey (USGS).

1 (ii) The person requesting the approval proposes to impact the riparian buffer of a surface water
2 that appears on the maps described in Sub-Item (12)(b)(i) of this Rule and either:

- 3 (A) Has received an on-site determination from the Division pursuant to Sub-Item (3)(a)
4 of this Rule that surface waters are not present;
- 5 (B) Has received an Authorization Certificate from the Division pursuant to Item (8) of
6 this Rule for uses designated as Allowable under this Rule;
- 7 (C) Has received an Authorization Certificate from the Division pursuant to Item (8) of
8 this Rule and obtained the Division's approval on a mitigation plan pursuant to Item
9 (10) of this Rule for uses designated as Allowable with Mitigation under this Rule; or
- 10 (D) Has received a variance from the Commission pursuant to Item (9) of this Rule.

11 (13) OTHER LAWS, REGULATIONS AND PERMITS. In all cases, compliance with this Rule does not
12 preclude the requirement to comply with all federal, state and local regulations and laws.

13
14 History Note: Authority 143-214.1; 143-214.7,- 143-215.3(a)(1); S. L. 1995, c. 572;
15 *Temporary Adoption, Eff. July 22, 1997;*
16 *Temporary Amendment, Eff. June 22, 1999; April 22, 1998; January 22, 1998;*
17 *Eff. August 1, 2000.*

15A NCAC 2B .0241 is proposed for adoption as follows:

**• 0241 NEUSE RIVER BASIN: NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
DELEGATION OF AUTHORITY FOR THE PROTECTION AND MAINTENANCE OF RIPARIAN
BUFFERS**

(a) **PURPOSE.** This Rule sets out the requirements for delegation of the responsibility for implementing and enforcing the state's riparian buffer protection program to local governments.

(b) **PROCEDURES FOR GRANTING AND RESCINDING DELEGATION.** The Commission shall grant and rescind local government delegation of the Neuse River Basin Riparian Buffer Protection requirements according to the following procedures.

- (1) Local governments within the Neuse River Basin may submit a written request to the Commission for authority to implement and enforce the State's riparian buffer protection requirements within their jurisdiction. The written request shall be accompanied by information which shows:
 - (A) The local government has land use jurisdiction for the riparian buffer demonstrated by delineating the local land use jurisdictional boundary on USGS 1:24,000 topographical map(s) or other appropriate scale map(s);
 - (B) The local government has the administrative organization, staff, legal authority, financial and other resources necessary to implement and enforce the State's riparian buffer protection requirements based on its size and projected amount of development;
 - (C) The local government has adopted ordinances, resolutions, or regulations necessary to establish and maintain the State's riparian buffer protection requirements; and
 - (D) The local government has provided a plan to address violations with appropriate remedies and actions.
- (2) Within 90 days after the Commission has received the request for delegation, the Commission shall notify the local government whether it has been approved, approved with modifications, or denied.
- (3) The Commission, upon determination that a delegated local authority is failing to implement or adequately enforce the state's riparian buffer protection requirements, shall notify the delegated local authority in writing of the local program's inadequacies. If the delegated local authority has not corrected the deficiencies within 90 days of receipt of the written notification, then the Commission shall rescind the delegation of authority to the local government and shall implement and enforce the State's riparian buffer protection requirements.
- (4) The Commission may delegate its duties and powers for granting and rescinding local government delegation of the State's riparian buffer protection requirements, in whole or in part, to the Director.

(c) **APPOINTMENT OF A RIPARIAN BUFFER PROTECTION ADMINISTRATOR.** Upon receiving delegation, local governments shall appoint a Riparian Buffer Protection Administrator who shall coordinate the implementation and enforcement of the program. The Administrator shall attend an initial training session by the Division and subsequent annual training sessions. The Administrator shall ensure that local government staff working directly with

the program receive training to understand, implement and enforce the program.

(d) **PROCEDURES FOR USES WITHIN RIPARIAN BUFFERS THAT ARE ALLOWABLE AND ALLOWABLE WITH MITIGATION.** Upon receiving delegation, local authorities shall be responsible for reviewing proposed uses within the riparian buffer and issuing approvals if the uses meet the State's riparian buffer protection requirements. Delegated local authorities shall issue an Authorization Certificate for uses if the proposed use meets the State's riparian buffer protection requirements, or provides for appropriate mitigated provisions to the State's riparian buffer protection requirements. The Division shall have the authority to challenge a decision made by a delegated local authority for a period of 30 days after the Authorization Certificate is issued. If the Division does not challenge an Authorization Certificate within 30 days of issuance, then the delegated local authority's decision will stand.

(e) **VARIANCES.** After receiving delegation, local governments shall be responsible for reviewing variance requests, providing approvals for minor variance requests and making recommendations to the Commission for major variance requests pursuant to the State's riparian buffer protection program.

(f) **LIMITS OF DELEGATED LOCAL AUTHORITY.** The Commission shall have jurisdiction to the exclusion of local governments to implement the State's riparian buffer protection requirements for the following types of activities:

- (1) Activities conducted under the authority of the State;
- (2) Activities conducted under the authority of the United States;
- (3) Activities conducted under the authority of multiple jurisdictions;

Activities conducted under the authority of local units of government.

(g) **RECORD-KEEPING REQUIREMENTS.** Delegated local authorities are required to maintain on-site records for a minimum of five years. Delegated local authorities must furnish a copy of these records to the Director within 30 days of receipt of a written request for the records. The Division will inspect local riparian buffer protection programs to ensure that the programs are being adequately implemented and enforced. Each delegated local authority's records shall include the following:

- (1) A copy of variance requests;
- (2) The variance request's finding of fact;
- (3) The result of the variance proceedings;
- (4) A record of complaints and action taken as a result of the complaint;
- (5) Records for stream origin calls and stream ratings; and

Copies of request for authorization, records approving authorization and Authorization Certificates.

History Note: Authority 143-214. 1; 143-214.7; 143-215.3(a)(1); Chapter 221, 1998 Session Laws.

15A NCAC 2B .0242 is proposed for adoption as follows:

• 0242 MITIGATION PROGRAM FOR PROTECTION AND MAINTENANCE OF RIPARIAN BUFFERS

The following are the requirements for the Riparian Buffer Mitigation Program.

- (1) **PURPOSE.** The purpose of this Rule is to set forth the mitigation requirements that apply to the State's riparian buffer protection program.
- (2) **APPLICABILITY.** This Rule applies to persons who wish to impact a riparian buffer when one of the following applies:
 - (a) A person has received an Authorization Certificate pursuant to 15A NCAC 2B .0233 for a proposed use that is designated as "allowable with mitigation."
 - (b) A person has received a variance pursuant to 15A NCAC 2B .0233 and is required to perform mitigation as a condition of a variance approval.
- (3) **THE AREA OF MITIGATION.** The required area of mitigation shall be determined by either the Division or the delegated local authority according to the following:
 - (a) The impacts in square feet to each zone of the riparian buffer shall be determined by the Division or the delegated local authority by adding the following:
 - G) The area of the footprint of the use causing the impact to the riparian buffer.
 - (ii) The area of the boundary of any clearing and grading activities within the riparian buffer necessary to accommodate the use.
 - (iii) The area of any ongoing maintenance corridors within the riparian buffer associated with the use.
 - (b) The required area of mitigation shall be determined by applying the following multipliers to the impacts determined in Sub-item (3)(a) of this Paragraph to each zone of the riparian buffer:
 - G) Impacts to Zone I of the riparian buffer shall be multiplied by 3.
 - (ii) Impacts to Zone 2 of the riparian buffer shall be multiplied by 1.5.
 - (iii) Impacts to wetlands within Zones I and 2 of the riparian buffer that are subject to mitigation under 15A NCAC 2H .0506 shall comply with the mitigation ratios in 15A NCAC 2H .0506.
- (4) **THE LOCATION OF MITIGATION.** The mitigation effort shall be located in the same Nutrient Management Zone of the Neuse River Basin of the proposed impact or lower in the basin. The four Nutrient Management Zones are laid out in the Division's Report, 'Total Maximum Daily Load for Total Nitrogen to the Neuse River Estuary, North Carolina' (February 1999).
- (5) **ISSUANCE OF THE MITIGATION DETERMINATION.** The Division or the delegated local authority shall issue a mitigation determination that specifies the required area and location of mitigation pursuant to Items (3) and (4) of this Paragraph.

- (6) **OPTIONS FOR MEETING THE MITIGATION DETERMINATION.** The mitigation determination made pursuant to Item (5) of this Paragraph may be met through one of the following options:
- (a) Payment of a compensatory mitigation fee to the Riparian Buffer Restoration Fund pursuant to Item (7) of this Paragraph.
 - (b) Donation of real property or of an interest in real property pursuant to Item (8) of this Paragraph.
 - (c) Restoration or enhancement of a riparian buffer that is not otherwise required to be protected. This shall be accomplished by the applicant after submittal and approval of a restoration plan pursuant to Item (9) of this Paragraph.
- (7) **PAYMENT TO THE RIPARIAN BUFFER RESTORATION FUND.** Persons who choose to satisfy their mitigation determination by paying a compensatory mitigation fee to the Riparian Buffer Restoration Fund shall meet the following requirements:
- (a) **SCHEDULE OF FEES:** The amount of payment into the Fund shall be determined by multiplying the acres or square feet of mitigation determination made pursuant to Item (5) of this Paragraph by ninety-six cents per square foot or forty-one thousand, six hundred and twenty-five dollars per acre.
 - (b) The required fee shall be submitted to the Division of Water Quality, Wetlands Restoration Program, P.O. Box 29535, Raleigh, NC 27626-0535 prior to any activity that results in the removal or degradation of the protected riparian buffer for which a "no practical alternatives" determination has been made.
 - (c) The payment of a compensatory mitigation fee may be fully or partially satisfied by donation of real property interests pursuant to Item (8) of this Paragraph.
 - (d) The fee outlined in Sub-item (7)(a) of this Paragraph shall be reviewed every two years and compared to the actual cost of restoration activities conducted by the Department, including site identification, planning, implementation, monitoring and maintenance costs. Based upon this biennial review, revisions to Sub-item (7)(a) of this Paragraph will be recommended when adjustments to this Schedule of Fees are deemed necessary.
- (8) **DONATION OF PROPERTY.** Persons who choose to satisfy their mitigation determination by donating real property or an interest in real property shall meet the following requirements:
- (a) The donation of real property interests may be used to either partially or fully satisfy the payment of a compensatory mitigation fee to the Riparian Buffer Restoration Fund pursuant to Item (7) of this Paragraph. The value of the property interest shall be determined by an appraisal performed in accordance with Sub-item (8)(d)(iv) of this Paragraph. The donation shall satisfy the mitigation determination if the appraised value of the donated property interest is equal to or greater than the required fee. If the appraised value of the donated property interest is less than the required fee calculated pursuant to Sub-item (7)(a) of this Paragraph, the applicant shall pay the remaining balance due.

- (b) The donation of conservation easements to satisfy compensatory mitigation requirements shall be accepted only if the conservation easement is granted in perpetuity.
- (c) Donation of real property interests to satisfy the mitigation determination shall be accepted only if such property meets all of the following requirements:
 - (i) The property shall be located within an area that is identified as a priority for restoration in the Basinwide Wetlands and Riparian Restoration Plan or shall be located at a site that is otherwise consistent with the goals outlined in the Basinwide Wetlands and Riparian Restoration Plan.
 - (ii) The property shall contain riparian buffers not currently protected by the State's riparian buffer protection program that are in need of restoration.
 - (iii) The restorable riparian buffer on the property shall have a minimum length of 1000 linear feet along a surface water and a minimum width of 50 feet as measured horizontally on a line perpendicular to the surface water.
 - (iv) The size of the restorable riparian buffer on the property to be donated shall equal or exceed the acreage of riparian buffer required to be mitigated under the mitigation responsibility determined pursuant to Item (3) of this Paragraph.
 - (v) The property shall not require excessive measures for successful restoration, such as removal of structures or infrastructure. Restoration of the property shall be capable of fully offsetting the adverse impacts of the requested use;
 - (vi) The property shall be suitable to be successfully restored, based on existing hydrology, soils, and vegetation;
 - (vii) The estimated cost of restoring and maintaining the property shall not exceed the value of the property minus site identification and land acquisition costs.
 - (ix) The property shall not contain cultural or historic resources.
 - (x) The property shall not contain any hazardous substance or solid waste.
 - (xi) The property shall not contain structures or materials that present health or safety problems to the general public. If wells, septic, water or sewer connections exist, they shall be filled, remediated or closed at owner's expense in accordance with state and local health and safety regulations.
 - (xii) The property shall have the potential to remove nitrogen, improve water quality and enhance natural resources after restoration. The Division shall consider whether the property is adjacent to or includes:
 - (A) a Department-approved restoration or preservation project or public lands;
 - (B) a sensitive natural resource, as identified in the Basinwide Wetland and Riparian Restoration Plan;

- (C) known occurrences of rare species as identified by the North Carolina Natural Heritage Program in the "Natural Heritage Program List of Rare Animal Species of North Carolina" or the "Natural Heritage Program List of the Rare Plant Species of North Carolina;"
 - (D) significant Natural Heritage Area as identified by the North Carolina Natural Heritage Program in the "North Carolina Natural Heritage Program Biennial Protection Plan, List of Significant Natural Heritage Areas." Copies of these documents may be obtained from the Department of Environment and Natural Resources, Division of Parks and Recreation, Natural Heritage Program, P.O. Box 27687, Raleigh, North Carolina 2761 1;
 - (E) federally or state-listed sensitive, endangered, or threatened species, or their critical habitat;
 - (F) non-supporting, partially supporting, or support-threatened waters as designated by the Division pursuant to 40 CFR 131.10(a) through (g). This material is available at the Department of Environment and Natural Resources, Division of Water Quality, Water Quality Section, 512 North Salisbury Street, Raleigh, North Carolina 27604;
- (xiii) The property and adjacent properties shall not have prior, current, and known future land use that would inhibit the function of the restoration effort.
- (xiv) The property shall not have any encumbrances or conditions on the transfer of the property interests.
- (d) At the expense of the applicant or donor, the following information shall be submitted to the Division with any proposal for donations or dedications of interest in real property:
- (i) Documentation that the property meets the requirements laid out in Sub-Item (8)(c) of this Paragraph.
 - (ii) US Geological Survey 1:24,000 (7.5 minute) scale topographic map, county tax map, USDA Natural Resource Conservation Service County Soil Survey Map, and county road map showing the location of the property to be donated along with information on existing site conditions, vegetation types, presence of existing structures and easements.
 - (iii) A current property survey performed in accordance with the procedures of the North Carolina Department of Administration, State Property Office as identified by the State Board of Registration for Professional Engineers and Land Surveyors in "Standards of Practice for Land Surveying in North Carolina." Copies may be obtained from the North Carolina State Board of Registration for Professional Engineers and Land Surveyors, 3620 Six Forks Road, Suite 300, Raleigh, North Carolina 27609.
 - (iv) A current appraisal of the value of the property performed in accordance with the procedures

of the North Carolina Department of Administration, State Property Office as identified by the Appraisal Board in the "Uniform Standards of Professional North Carolina Appraisal Practice." Copies may be obtained from the Appraisal Foundation, Publications Department, P.O. Box 96734, Washington, D.C. 20090-6734.

- (v) A title certificate.
- (9) **RIPARIAN BUFFER RESTORATION OR ENHANCEMENT.** Persons who choose to meet their mitigation requirement through riparian buffer restoration or enhancement shall meet the following requirements:
- (a) The applicant may restore or enhance a riparian buffer that is not protected under the State's riparian buffer protection program if either of the following applies:
 - G) The area of riparian buffer restoration is equal to the required area of mitigation determined pursuant to Item (3) of this Paragraph.
 - (ii) The area of riparian buffer enhancement is three times larger than the required area of mitigation determined pursuant to Item (3) of this Paragraph.
 - (b) The location of the riparian buffer restoration or enhancement shall comply with the requirements in Item (4) of this Paragraph.
 - (c) The riparian buffer restoration or enhancement site shall have a minimum width of 50 feet as measured horizontally on a line perpendicular to the surface water.
 - (d) The applicant shall first receive an Authorization Certificate for the proposed use according to the requirements of 15A NCAC 2B .0233. After receiving this determination, the applicant shall submit a restoration or enhancement plan for approval by the Division. The restoration or enhancement plan shall contain the following.
 - G) A map of the proposed restoration or enhancement site.
 - (ii) A vegetation plan. The vegetation plan shall include a minimum of at least two native hardwood tree species planted at a density sufficient to provide 320 trees per acre at maturity.
 - (iii) A grading plan. The site shall be graded in a manner to ensure diffuse flow through the riparian buffer.
 - (iv) A fertilization plan.
 - (v) A schedule for implementation.
 - (e) Within one year after the Division has approved the restoration or enhancement plan, the applicant shall present proof to the Division that the riparian buffer has been restored or enhanced. If proof is not presented within this timeframe, then the person shall be in violation of the State's or the delegated local authority's riparian buffer protection program.
 - (f) The mitigation area shall be placed under a perpetual conservation easement whose terms are acceptable to the Division.

- (g) The applicant shall submit annual reports for a period of five years after the restoration or enhancement showing that the trees planted have survived and that diffuse flow through the riparian buffer has been maintained. The applicant shall be responsible for replacing trees that do not survive and for restoring diffuse flow if needed during that five-year period.

History Note: *Authority 143-214. 1; 143-214.7; 143-215.3(a)(1); Chapter 221, 1998 Session*

Laws.

Temporary Adoption, Eff. June 22, 1999;

Eff. August 1, 2000.

1 15A NCAC 2B .0233 has been adopted as published in 14:4 NCR 287-301 as follows:
2

3 • 0233 NEUSE RIVER BASIN: NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
4 PROTECTION AND MAINTENANCE OF EXISTING RIPARIAN BUFFERS

5 The following is the management strategy for maintaining and protecting existing riparian buffers in the Neuse
6 River Basin.

7 (1) PURPOSE. The purpose of this Rule shall be to protect and preserve existing riparian buffers in the
8 Neuse River Basin to maintain their nutrient removal functions.

9 (2) DEFINITIONS. For the purpose of this Rule, these terms shall be defined as follows:

10 (a) 'Channel' means a natural water-carrying trough cut vertically into low areas of the land surface by
11 erosive action of concentrated flowing water or a ditch or canal excavated for the flow of water.

12 (current definition in Forest Practice Guidelines Related to Water Quality, 15A NCAC 11 .0 102)

13 (b) 'DBH' means Diameter at Breast Height of a tree, which is measured at 4.5 feet above ground
14 surface level.

15 (c) 'Ditch or canal' means a man-made channel other than a modified natural stream constructed for
16 drainage purposes that is typically dug through inter-stream divide areas. A ditch or canal may have
17 flows that are perennial, intermittent, or ephemeral and may exhibit hydrological and biological
18 characteristics similar to perennial or intermittent streams.

19 (d) 'Ephemeral (stormwater) stream' means a feature that carries only stormwater in direct response to
20 precipitation with water flowing only during and shortly after large precipitation events. An
21 ephemeral stream may or may not have a well-defined channel, the aquatic bed is always above the
22 water table, and stormwater runoff is the primary source of water. An ephemeral stream typically
23 lacks the biological, hydrological, and physical characteristics commonly associated with the
24 continuous or intermittent conveyance of water.

25 (e) 'Forest plantation' means an area of planted trees that may be conifers (pines) or hardwoods. On a
26 plantation, the intended crop trees are planted rather than naturally regenerated from seed on the
27 site, coppice (sprouting), or seed that is blown or carried into the site.

28 (f) 'High Value Tree' means a tree that meets or exceeds the following standards: for pine species, 14-
29 inch DBH or greater or 18-inch or greater stump diameter; and, for hardwoods and wetland species,
30 16-inch DBH or greater or 24-inch or greater stump diameter.

31 (g) 'Intermittent stream' means a well-defined channel that contains water for only part of the year,
32 typically during winter and spring when the aquatic bed is below the water table. The flow may be
33 heavily supplemented by stormwater runoff. An intermittent stream often lacks the biological and
34 hydrological characteristics commonly associated with the conveyance of water.

35 (h) 'Modified natural stream' means an on-site channelization or relocation of a stream channel and

1 subsequent relocation of the intermittent or perennial flow as evidenced by topographic alterations
2 in the immediate watershed. A modified natural stream must have the typical biological,
3 hydrological, and physical characteristics commonly associated with the continuous conveyance of
4 water.

5 (i) 'Perennial stream' means a well-defined channel that contains water year round during a year of
6 normal rainfall with the aquatic bed located below the water table for most of the year.
7 Groundwater is the primary source of water for a perennial stream, but it also carries stormwater
8 runoff. A perennial stream exhibits the typical biological, hydrological, and physical characteristics
9 commonly associated with the continuous conveyance of water.

10 (j) 'Perennial waterbody' means a natural or man-made basin that stores surface water permanently at
11 depths sufficient to preclude growth of rooted plants, including lakes, ponds, sounds, non-stream
12 estuaries and ocean. For the purpose of the State's riparian buffer protection program, the
13 waterbody must be part of a natural drainageway (i.e., connected by surface flow to a stream).

14 (k) 'Stream' means a body of concentrated flowing water in a natural low area or natural channel on the
15 land surface.

16 (l) 'Surface water' means all waters of the state as defined in G.S. 143-212 except underground waters.

17 (m) 'Tree' means a woody plant with a DBH equal to or exceeding five inches.

18 (3) **APPLICABILITY.** This Rule shall apply to 50-foot wide riparian buffers directly adjacent to surface
19 waters in the Neuse River Basin (intermittent streams, perennial streams, lakes, ponds, and estuaries),
20 excluding wetlands. Except as described in Sub-Item (4)(a)(iii) of this Rule, wetlands adjacent to surface
21 waters or within 50 feet of surface waters shall be considered as part of the riparian buffer but are
22 regulated pursuant to 15A NCAC 2H.0506. The riparian buffers protected by this Rule shall be measured
23 pursuant to Item (4) of this Rule. For the purpose of this Rule, a surface water shall be present if the
24 feature is approximately shown on either the most recent version of the soil survey map prepared by the
25 Natural Resources Conservation Service of the United States Department of Agriculture or the most recent
26 version of the 1:24,000 scale (7.5 minute) quadrangle topographic maps prepared by the United States
27 Geologic Survey (USGS). Riparian buffers adjacent to surface waters that do not appear on either of the
28 maps shall not be subject to this Rule. Riparian buffers adjacent to surface waters that appear on the maps
29 shall be subject to this Rule unless one of the following applies.

30 (a) **EXEMPTION WHEN AN ON-SITE DETERMINATION SHOWS THAT SURFACE WATERS**
31 **ARE NOT PRESENT.** When a landowner or other affected party believes that the maps have
32 inaccurately depicted surface waters, he or she shall consult the Division or the appropriate
33 delegated local authority. Upon request, the Division or delegated local authority shall make on-site
34 determinations. Any disputes over on-site determinations shall be referred to the Director in writing.
35 A determination of the Director as to the accuracy or application of the maps is subject to review as

1 provided in Articles 3 and 4 of G. S. 150B. Surface waters that appear on the maps shall not be
2 subject to this Rule if an on-site determination shows that they fall into one of the following
3 categories.

4 (i) Ditches and manmade conveyances other than modified natural streams unless constructed
5 for navigation or boat access.

6 (ii) Manmade ponds and lakes that are located outside natural drainage ways.

7 (iii) Ephemeral (stormwater) streams.

8 (b) EXEMPTION WHEN EXISTING USES ARE PRESENT AND ONGOING. This Rule shall not
9 apply to portions of the riparian buffer where a use is existing and ongoing according to the
10 following:

11 (i) A use shall be considered existing if it was present within the riparian buffer as of July 22,
12 1997. Existing uses shall include, but not be limited to, agriculture, buildings, industrial
13 facilities, commercial areas, transportation facilities, maintained lawns, utility lines and on-
14 site sanitary sewage systems. Only the portion of the riparian buffer that contains the
15 footprint of the existing use is exempt from this Rule. Activities necessary to maintain uses
16 are allowed provided that no additional vegetation is removed from Zone I except that
17 grazed or trampled by livestock and existing diffuse flow is maintained. Grading and
18 revegetating Zone 2 is allowed provided that the health of the vegetation in Zone I is not
19 compromised, the ground is stabilized and existing diffuse flow is maintained.

20 (ii) At the time an existing use is proposed to be converted to another use, this Rule shall apply.
21 An existing use shall be considered to be converted to another use if any of the following
22 applies:

23 (A) Impervious surface is added to the riparian buffer in locations where it did not exist
24 previously.

25 (B) An agricultural operation within the riparian buffer is converted to a non-agricultural
26 use.

27 (C) A lawn within the riparian buffer ceases to be maintained.

28 (4) ZONES OF THE RIPARIAN BUFFER. The protected riparian buffer shall have two zones as follows:

29 (a) Zone I shall consist of a vegetated area that is undisturbed except for uses provided for in Item (6)
30 of this Rule. The location of Zone I shall be as follows:

31 G) For intermittent and perennial streams, Zone I shall begin at the most landward limit of the
32 top of bank or the rooted herbaceous vegetation and extend landward a distance of 30 feet on
33 all sides of the surface water, measured horizontally on a line perpendicular to the surface
34 water.

35 (ii) For ponds, lakes and reservoirs located within a natural drainage way, Zone I shall begin at

1 the most landward limit of the normal water level or the rooted herbaceous vegetation and
2 extend landward a distance of 30 feet, measured horizontally on a line perpendicular to the
3 surface water.

4 (iii) For surface waters within the 20 Coastal Counties (defined in 15A NCAC 2B .0202) within
5 the jurisdiction of the Division of Coastal Management, Zone I shall begin at the most
6 landward limit of the following options, whichever is more restrictive, and extend landward a
7 distance of 30 feet, measured horizontally on a line perpendicular to the surface water:

8 (A) the normal high water level;

9 (B) the normal water level; or

10 (C) the landward limit of coastal wetlands as defined by the Division of Coastal
11 Management.

12 (b) Zone 2 shall consist of a stable, vegetated area that is undisturbed except for activities and uses
13 provided for in Item (6) of this Rule. Grading and revegetating Zone 2 is allowed provided that the
14 health of the vegetation in Zone I is not compromised. Zone 2 shall begin at the outer edge of Zone
15 I and extend landward 20 feet as measured horizontally on a line perpendicular to the surface water.

16 The combined width of Zones I and 2 shall be 50 feet on all sides of the surface water.

17 (5) **DIFFUSE FLOW REQUIREMENT.** Diffuse flow of runoff shall be maintained in the riparian buffer by
18 dispersing concentrated flow and reestablishing vegetation.

19 (a) Concentrated runoff from new ditches or manmade conveyances shall be converted to diffuse flow
20 before the runoff enters Zone 2 of the riparian buffer.

21 (b) Periodic corrective action to restore diffuse flow shall be taken if necessary to impede the formation
22 of erosion gullies.

23

1 (6)TABLE OF USES. The following chart sets out the uses and their designation under this Rule as exempt,
 2 allowable, allowable with mitigation, or prohibited. The requirements for each category are given in Item
 3 (7) of this Rule.

	Exempt	Allowable	Allowable with Mitigation	Prohibited
Airport facilities: <ul style="list-style-type: none"> • Airport facilities that impact equal to or less than 150 linear feet or one-third of an acre of riparian buffer • Airport facilities that impact greater than 150 linear feet or one-third of an acre of riparian buffer 		X	X	
Archaeological activities	X			
Bridges		X		
Dam maintenance activities	X			

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	Exempt	Allowable	Allowable with Mitigation	Prohibited
<p>Drainage ditches, roadside ditches and stormwater outfalls through riparian buffers:</p> <ul style="list-style-type: none"> • Existing drainage ditches, roadside ditches, and stormwater outfalls provided that they are managed to minimize the sediment, nutrients and other pollution that convey to waterbodies • New drainage ditches, roadside ditches and stormwater outfalls provided that a stormwater management facility is installed to control nitrogen and attenuate flow before the conveyance discharges through the riparian buffer • New drainage ditches, roadside ditches and stormwater outfalls that do not provide control for nitrogen before discharging through the riparian buffer • Excavation of the streambed in order to bring it to the same elevation as the invert of a ditch 	X	X		X X
<p>Drainage of a pond in a natural drainage way provided that a new riparian buffer that meets the requirements of Items (4) and (5) of this Rule is established adjacent to the new</p>	X			
<p>Driveway crossings of streams and other surface waters subject to this Rule:</p> <ul style="list-style-type: none"> • Driveway crossings on single family residential lots that disturb equal to or less than 25 linear feet or 2,500 square feet of riparian buffer • Driveway crossings on single family residential lots that disturb greater than 25 linear feet or 2,500 square feet of riparian buffer • In a subdivision that cumulatively disturb equal to or less than 150 linear feet or one-third of an acre of riparian buffer • In a subdivision that cumulatively disturb greater than 150 linear feet or one-third of an acre of riparian buffer 	X	X X	X	

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	Exempt	Allowable	<u>Allowable with Mitigation</u>	Prohibited
Fences provided that disturbance is minimized and installation does not result in removal of forest vegetation	X			
Forest harvesting - see Item (I 1) of this Rule				
Fertilizer application: <ul style="list-style-type: none"> • One-time fertilizer application to establish replanted vegetation • Ongoing fertilizer application 	X			X
Grading and revegetation in Zone 2 only provided that diffuse flow and the health of existing vegetation in Zone I is not compromised and disturbed areas are stabilized	X			
Greenway / hiking trails		X		
Historic preservation	X			
Landfills as defined by G.S. 130A-290.				X
Mining activities: <ul style="list-style-type: none"> • Mining activities that are covered by the Mining Act provided that new riparian buffers that meet the requirements of Items (4) and (5) of this Rule are established adjacent to the relocated channels • Mining activities that are not covered by the Mining Act OR where new riparian buffers that meet the requirements or Items (4) and (5) of this Rule are not established adjacent to the relocated channels • Wastewater or mining dewatering wells with approved NPDES permit 	X	X	X	

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	Exempt	Allowable	Allowable with Mitigation	Prohibited
Non-electric utility lines: <ul style="list-style-type: none"> • Impacts other than perpendicular crossings in Zone 2 only ³ • Impacts other than perpendicular crossings in Zone 1 ³ 		X	X	
Non-electric utility line perpendicular crossings of streams and other surface waters subject to this Rule . <ul style="list-style-type: none"> • Perpendicular crossings that disturb equal to or less than 40 linear feet of riparian buffer with a maintenance corridor equal to or less than 10 feet in width • Perpendicular crossings that disturb equal to or less than 40 linear feet of riparian buffer with a maintenance corridor greater than 10 feet in width • Perpendicular crossings that disturb greater than 40 linear feet but equal to or less than 150 linear feet of riparian buffer with a maintenance corridor equal to or less than 10 feet in width • Perpendicular crossings that disturb greater than 40 linear feet but equal to or less than 150 linear feet of riparian buffer with a maintenance corridor greater than 10 feet in width • Perpendicular crossings that disturb greater than 150 linear feet of riparian buffer 	X	X X	X X	
On-site sanitary sewage systems - new ones that use ground absorption				X
Overhead electric utility lines: <ul style="list-style-type: none"> • Impacts other than perpendicular crossings in Zone 2 only ³ • Impacts other than perpendicular crossings in Zone 1 ^{1,2,3} 	X X			

	Exempt	Allowable	Allowable with Mitigation	Prohibited
Overhead electric utility line perpendicular crossings of streams and other surface waters subject to this Rule ³ . <ul style="list-style-type: none"> • Perpendicular crossings that disturb equal to or less than 150 linear feet of riparian buffer ¹ • Perpendicular crossings that disturb greater than 150 linear feet of riparian buffer ^{1,2} 	X	X		
Periodic maintenance of modified natural streams such as canals and a grassed travelway on one side of the surface water when alternative forms of maintenance access are not practical		X		

1 ¹ Provided that, in Zone 1, all of the following BMPs for overhead utility lines are used. If all of these BMPs are not
2 used, then the overhead utility lines shall require a no practical alternative evaluation by the Division.

- 3 • A minimum zone of 10 feet wide immediately adjacent to the water body shall be managed such that only
4 vegetation that poses a hazard or has the potential to grow tall enough to interfere with the line is removed.
- 5 • Woody vegetation shall be cleared by hand. No land grubbing or grading is allowed.
- 6 • Vegetative root systems shall be left intact to maintain the integrity of the soil. Stumps shall remain where trees
7 are cut.
- 8 • Rip rap shall not be used unless it is necessary to stabilize a tower.
- 9 • No fertilizer shall be used other than a one-time application to re-establish vegetation.
- 10 • Construction activities shall minimize the removal of woody vegetation, the extent of the disturbed area, and the
11 time in which areas remain in a disturbed state.
- 12 • Active measures shall be taken after construction and during routine maintenance to ensure diffuse flow of
13 stormwater through the buffer.
- 14 • In wetlands, mats shall be utilized to minimize soil disturbance.

15 ² Provided that poles or towers shall not be installed within 10 feet of a water body unless the Division completes a
16 no practical alternative evaluation.

17 ³ Perpendicular crossings are those that intersect the surface water at an angle between 75' and 105'.

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	Exempt	Allowable	Allowable with Mitigation	Prohibited
Playground equipment: <ul style="list-style-type: none"> • Playground equipment on single family lots provided that installation and use does not result in removal of vegetation • Playground equipment installed on lands other than single-family lots or that requires removal of vegetation 	X	X		
Ponds in natural drainage ways, excluding dry ponds: <ul style="list-style-type: none"> • New ponds provided that a riparian buffer that meets the requirements of Items (4) and (5) of this Rule is established adjacent to the pond • New ponds where a riparian buffer that meets the requirements of Items (4) and (5) of this Rule is NOT established adjacent to the pond 		X	X	
Protection of existing structures, facilities and streambanks when this requires additional disturbance of the riparian buffer or the stream channel		X		
Railroad impacts other than crossings of streams and other surface waters subject to this Rule			<u>X</u>	
Railroad crossings of streams and other surface waters subject to this Rule: <ul style="list-style-type: none"> • Railroad crossings that impact equal to or less than 40 linear feet of riparian buffer • Railroad crossings that impact greater than 40 linear feet but-equal to or less than 150 linear feet or one-third of an acre of riparian buffer • Railroad crossings that impact greater than 150 linear feet or one-third of an acre of riparian buffer 	X	X	X	

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	Exempt	Allowable	Allowable with Mitigation	Prohibited
Removal of previous fill or debris provided that diffuse flow is maintained and any vegetation removed is restored	X			
Road impacts other than crossings of streams and other surface waters subject to this Rule			X	
Road crossings of streams and other surface waters subject to this Rule: <ul style="list-style-type: none"> • Road crossings that impact equal to or less than 40 linear feet of riparian buffer • Road crossings that impact greater than 40 linear feet but equal to or less than 150 linear feet or one-third of an acre of riparian buffer • Road crossings that impact greater than 150 linear feet or one-third of an acre of riparian buffer 	X	X	X	
Scientific studies and stream gauging	X			
Stormwater management ponds excluding dry ponds: <ul style="list-style-type: none"> • New stormwater management ponds provided that a riparian buffer that meets the requirements of Items (4) and (5) of this Rule is established adjacent to the pond • New stormwater management ponds where a riparian buffer that meets the requirements of Items (4) and (5) of this Rule is NOT established adjacent to the pond 		X	X	
Stream restoration	X			
Streambank stabilization		X		

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	Exempt	Allowable	Allowable with Mitigation	Prohibited
<p>Temporary roads:</p> <ul style="list-style-type: none"> • Temporary roads that disturb less than or equal to 2,500 square feet provided that vegetation is restored within six months of initial disturbance • Temporary roads that disturb greater than 2,500 square feet provided that vegetation is restored within six months of initial disturbance • Temporary roads used for bridge construction or replacement provided that restoration activities, such as soil stabilization and revegetation, are conducted immediately after construction 	X	X		
<p>Temporary sediment and erosion control devices:</p> <ul style="list-style-type: none"> • In Zone 2 only provided that the vegetation in Zone I is not compromised and that discharge is released as diffuse flow in accordance with Item (5) of this Rule • In Zones I and 2 to control impacts associated with uses approved by the Division or that have received a variance provided that sediment and erosion control for upland areas is addressed to the maximum extent practical outside the buffer • In-stream temporary erosion and sediment control measures for work within a stream channel 	X	X		
<p>Underground electric utility lines:</p> <ul style="list-style-type: none"> • Impacts other than perpendicular crossings in Zone 2 only ³ • Impacts other than perpendicular crossings in Zone 1 ^{3,4} 	X			

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	Exempt	Allowable	Allowable with Mitigation	Prohibited
Underground electric utility line perpendicular crossings of streams and other surface waters subject to this Rule : <ul style="list-style-type: none"> • Perpendicular crossings that disturb less than or equal to 40 linear feet of riparian buffer ⁴ • Perpendicular crossings that disturb greater than 40 linear feet of riparian buffer ⁴ 	X	X		

2 ⁴ Provided that, in Zone 1, all of the following BMPs for underground utility lines are used. If all of these BMPs are
 3 not used, then the underground utility line shall require a no practical alternative evaluation by the Division.

- 4 • Woody vegetation shall be cleared by hand. No land grubbing or grading is allowed.
- 5 • Vegetative root systems shall be left intact to maintain the integrity of the soil. Stumps shall remain, except in the
- 6 trench, where trees are cut.
- 7 • Underground cables shall be installed by vibratory plow or trenching.
- 8 • The trench shall be backfilled with the excavated soil material immediately following cable installation.
- 9 • No fertilizer shall be used other than a one-time application to re-establish vegetation.
- 10 • Construction activities shall minimize the removal of woody vegetation, the extent of the disturbed area, and the
- 11 time in which areas remain in a disturbed state.
- 12 • Active measures shall be taken after construction and during routine maintenance to ensure diffuse flow of
- 13 stormwater through the buffer.
- 14 • In wetlands, mats shall be utilized to minimize soil disturbance.

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	Exempt	Allowable	Allowable with Mitigation	Prohibited
Vegetation management: <ul style="list-style-type: none"> • Emergency fire control measures provided that topography is restored • Periodic mowing and harvesting of plant products in Zone 2 only • Planting vegetation to enhance the riparian buffer • Pruning forest vegetation provided that the health and function of the forest vegetation is not compromised • Removal of individual trees which are in danger of causing damage to dwellings, other structures or human life • Removal of poison ivy • Removal of understory nuisance vegetation as defined in: Smith, Cherri L. 1998. Exotic Plant Guidelines. Department of Environment and Natural Resources. Division of Parks and Recreation. Raleigh, NC. Guideline #30 	X X X X X X X			
Water dependent structures as defined in 15A NCAC 2B .0202		X		
Water supply reservoirs: <ul style="list-style-type: none"> • New reservoirs provided that a riparian buffer that meets the requirements of Items (4) and (5) of this Rule is established adjacent to the reservoir • New reservoirs where a riparian buffer that meets the requirements of Items (4) and (5) of this Rule is NOT established adjacent to the reservoir 		X	X	
Water wells	X			
Wetland restoration	X			

2

3

(7) REQUIREMENTS FOR CATEGORIES OF USES. Uses designated as exempt, allowable, allowable

1 with mitigation and prohibited in Item (6) of this Rule shall have the following requirements:

- 2 (a) **EXEMPT.** Uses designated as exempt are allowed within the riparian buffer. Exempt uses shall be
3 designed, constructed and maintained to minimize soil disturbance and to provide the maximum
4 water quality protection practicable. In addition, exempt uses shall meet requirements listed in Item
5 (6) of this Rule for the specific use.
- 6 (b) **ALLOWABLE.** Uses designated as allowable may proceed within the riparian buffer provided that
7 there are no practical alternatives to the requested use pursuant to Item (8) of this Rule. These uses
8 require written authorization from the Division or the delegated local authority.
- 9 (c) **ALLOWABLE WITH MITIGATION.** Uses designated as allowable with mitigation may proceed
10 within the riparian buffer provided that there are no practical alternatives to the requested use
11 pursuant to Item (8) of this Rule and an appropriate mitigation strategy has been approved pursuant
12 to Item (10) of this Rule. These uses require written authorization from the Division or the
13 delegated local authority.
- 14 (d) **PROHIBITED.** Uses designated as prohibited may not proceed within the riparian buffer unless a
15 variance is granted pursuant to Item (9) of this Rule. Mitigation may be required as one condition
16 of a variance approval.

17 (8) **DETERMINATION OF "NO PRACTICAL ALTERNATIVES."** Persons who wish to undertake uses
18 designated as allowable or allowable with mitigation shall submit a request for a "no practical alternatives"
19 determination to the Division or to the delegated local authority. The applicant shall certify that the
20 criteria identified in Sub-Item (8)(a) of this Rule are met. The Division or the delegated local authority
21 shall grant an Authorization Certificate upon a "no practical alternatives" determination. The procedure
22 for making an Authorization Certificate shall be as follows:

- 23 (a) For any request for an Authorization Certificate, the Division or the delegated local authority shall
24 review the entire project and make a finding of fact as to whether the following requirements have
25 been met in support of a "no practical alternatives" determination:
 - 26 (i) The basic project purpose cannot be practically accomplished in a manner that would better
27 minimize disturbance, preserve aquatic life and habitat, and protect water quality.
 - 28 (ii) The use cannot practically be reduced in size or density, reconfigured or redesigned to better
29 minimize disturbance, preserve aquatic life and habitat, and protect water quality.
 - 30 (iii) Best management practices shall be used if necessary to minimize disturbance, preserve
31 aquatic life and habitat, and protect water quality.
- 32 (b) Requests for an Authorization Certificate shall be reviewed and either approved or denied within 60
33 days of receipt of a complete submission based on the criteria in Sub-Item (8)(a) of this Rule by
34 either the Division or the delegated local authority. Failure to issue an approval or denial within 60
35 days shall constitute that the applicant has demonstrated "no practical alternatives." The Division

1 or the delegated local authority may attach conditions to the Authorization Certificate that support
2 the purpose, spirit and intent of the riparian buffer protection program. Complete submissions shall
3 include the following:

- 4 G) The name, address and phone number of the applicant;
- 5 (ii) The nature of the activity to be conducted by the applicant;
- 6 (iii) The location of the activity, including the jurisdiction;
- 7 (iv) A map of sufficient detail to accurately delineate the boundaries of the land to be utilized in
8 carrying out the activity, the location and dimensions of any disturbance in riparian buffers
9 associated with the activity, and the extent of riparian buffers on the land;
- 10 (v) An explanation of why this plan for the activity cannot be practically accomplished, reduced
11 or reconfigured to better minimize disturbance to the riparian buffer, preserve aquatic life
12 and habitat and protect water quality; and
- 13 (vi) Plans for any best management practices proposed to be used to control the impacts
14 associated with the activity.

15 (c) Any disputes over determinations regarding Authorization Certificates shall be referred to the
16 Director for a decision. The Director's decision is subject to review as provided in Articles 3 and 4
17 of G. S. 150B.

18 (9) VARIANCES. Persons who wish to undertake uses designated as prohibited may pursue a variance. The
19 Division or the appropriate delegated local authority may grant minor variances. The variance request
20 procedure shall be as follows:

21 (a) For any variance request, the Division or the delegated local authority shall make a finding of fact
22 as to whether the following requirements have been met:

23 G) There are practical difficulties or unnecessary hardships that prevent compliance with the
24 strict letter of the riparian buffer protection requirements. Practical difficulties or
25 unnecessary hardships shall be evaluated in accordance with the following:

26 (A) If the applicant complies with the provisions of this Rule, he/she can secure no
27 reasonable return from, nor make reasonable use of, his/her property. Merely proving
28 that the variance would permit a greater profit from the property shall not be
29 considered adequate justification for a variance. Moreover, the Division or delegated
30 local authority shall consider whether the variance is the minimum possible deviation
31 from the terms of this Rule that shall make reasonable use of the property possible.

32 (B) The hardship results from application of this Rule to the property rather than from
33 other factors such as deed restrictions or other hardship.

34 (C) The hardship is due to the physical nature of the applicant's property, such as its size,
35 shape, or topography, which is different from that of neighboring property.

- 1 (D) The applicant did not cause the hardship by knowingly or unknowingly violating this
2 Rule.
- 3 (E) The applicant did not purchase the property after the effective date of this Rule, and
4 then requesting an appeal.
- 5 (F) The hardship is unique to the applicant's property, rather than the result of conditions
6 that are widespread. If other properties are equally subject to the hardship created in
7 the restriction, then granting a variance would be a special privilege denied to others,
8 and would not promote equal justice.
- 9 (ii) The variance is in harmony with the general purpose and intent of the State's riparian buffer
10 protection requirements and preserves its spirit; and
- 11 (iii) In granting the variance, the public safety and welfare have been assured, water quality has
12 been protected, and substantial justice has been done.
- 13 (b) **MINOR VARIANCES.** A minor variance request pertains to activities that are proposed only to
14 impact any portion of Zone 2 of the riparian buffer. Minor variance requests shall be reviewed and
15 approved based on the criteria in Sub-Item (9)(a) of this Rule by the either the Division or the
16 delegated local authority pursuant to G.S. 153A-Article 18, or G.S. 160A-Article 19. The Division
17 or the delegated local authority may attach conditions to the variance approval that support the
18 purpose, spirit and intent of the riparian buffer protection program. Requests for appeals of
19 decisions made by the Division shall be made to the Office of Administrative Hearings. Request for
20 appeals made by the delegated local authority shall be made to the appropriate Board of Adjustment
21 under G.S. 160A-388 or G.S. 153A-345.
- 22 (c) **MAJOR VARIANCES.** A major variance request pertains to activities that are proposed to impact
23 any portion of Zone I or any portion of both Zones I and 2 of the riparian buffer. If the Division or
24 the delegated local authority has determined that a major variance request meets the requirements in
25 Sub-Item (9)(a) of this Rule, then it shall prepare a preliminary finding and submit it to the
26 Commission. Preliminary findings on major variance requests shall be reviewed by the
27 Commission within 90 days after receipt by the Director. Requests for appeals of determinations
28 that the requirements of Sub-Item (9)(a) of this Rule have not been met shall be made to the Office
29 of Administrative Hearings for determinations made by the Division or the appropriate Board of
30 Adjustments under G.S. 160A-388 or G.S. 153A-345 for determinations made by the delegated
31 local authority. The purpose of the Commission's review is to determine if it agrees that the
32 requirements in Sub-Item (9)(a) of this Rule have been met. Requests for appeals of decisions made
33 by the Commission shall be made to the Office of Administrative Hearings. The following actions
34 shall be taken depending on the Commission's decision on the major variance request:
- 35 G) Upon the Commission's approval, the Division or the delegated local authority shall issue a

1 final decision granting the major variance.

2 (ii) Upon the Commission's approval with conditions or stipulations, the Division or the
3 delegated local authority shall issue a final decision, which includes these conditions or
4 stipulations.

5 (iii) Upon the Commission's denial, the Division or the delegated local authority shall issue a
6 final decision denying the major variance.

7 (10) MITIGATION. Persons who wish to undertake uses designated as allowable with mitigation shall meet the
8 following requirements in order to proceed with their proposed use.

9 (a) Obtain a determination of "no practical alternatives" to the proposed use pursuant to Item (8) of this
10 Rule.

11 (b) Obtain approval for a mitigation proposal pursuant to 15A NCAC 2B .0242.

12 (I 1) REQUIREMENTS SPECIFIC TO FOREST HARVESTING. The following requirements shall apply for
13 forest harvesting operations and practices.

14 (a) The following measures shall apply in the entire riparian buffer:

15 (i) Logging decks and sawmill sites shall not be placed in the riparian buffer.

16 (ii) Access roads and skid trails shall be prohibited except for temporary and permanent stream
17 crossings established in accordance with 15A NCAC 11 .0203. Temporary stream crossings
18 shall be permanently stabilized after any site disturbing activity is completed.

19 (iii) Timber felling shall be directed away from the stream or water body.

20 (iv) Skidding shall be directed away from the stream or water body and shall be done in a manner
21 that minimizes soil disturbance and prevents the creation of channels or ruts.

22 (v) Individual trees may be treated to maintain or improve their health, form or vigor.

23 (vi) Harvesting of dead or infected trees or application of pesticides necessary to prevent or
24 control extensive tree pest and disease infestation shall be allowed. These practices must be
25 approved by the Division of Forest Resources for a specific site. The Division of Forest
26 Resources must notify the Division of all approvals.

27 (vii) Removal of individual trees that are in danger of causing damage to structures or human life
28 shall be allowed.

29 (viii) Natural regeneration of forest vegetation and planting of trees, shrubs, or ground cover plants
30 to enhance the riparian buffer shall be allowed provided that soil disturbance is minimized.
31 Plantings shall consist primarily of native species.

32 (ix) High intensity prescribed burns shall not be allowed.

33 W Application of fertilizer shall not be allowed except as necessary for permanent stabilization.

34 Broadcast application of fertilizer or herbicides to the adjacent forest stand shall be
35 conducted so that the chemicals are not applied directly to or allowed to drift into the riparian

1 buffer.

2 (b) In Zone 1, forest vegetation shall be protected and maintained. Selective harvest as provided for
3 below is allowed on forest lands that have a deferment for use value under forestry in accordance
4 with G.S. 105-277.2 through 277.6 or on forest lands that have a forest management plan prepared
5 or approved by a registered professional forester. Copies of either the approval of the deferment for
6 use value under forestry or the forest management plan shall be produced upon request. For such
7 forest lands, selective harvest is allowed in accordance with the following:

8 (G) Tracked or wheeled vehicles are not permitted except at stream crossings designed,
9 constructed and maintained in accordance with 15A NCAC 11 .0203.

10 (ii) Soil disturbing site preparation activities are not allowed.

11 (iii) Trees shall be removed with the minimum disturbance to the soil and residual vegetation.

12 (iv) The following provisions for selective harvesting shall be met:

13 (A) The first 10 feet of Zone I directly adjacent to the stream or waterbody shall be
14 undisturbed except for the removal of individual high value trees as defined provided
15 that no trees with exposed primary roots visible in the streambank be cut.

16 (B) In the outer 20 feet of Zone 1, a maximum of 50 percent of the trees greater than five
17 inches dbh may be cut and removed. The reentry time for harvest shall be no more
18 frequent than every 15 years, except on forest plantations where the reentry time shall
19 be no more frequent than every five years. In either case, the trees remaining after
20 harvest shall be as evenly spaced as possible.

21 (C) In Zone 2, harvesting and regeneration of the forest stand shall be allowed provided
22 that sufficient ground cover is maintained to provide for diffusion and infiltration of
23 surface runoff.

24 (12) REQUIREMENTS SPECIFIC TO LOCAL GOVERNMENTS WITH STORMWATER PROGRAMS
25 FOR NITROGEN CONTROL. Local governments that are required to have local stormwater programs
26 pursuant to 15A NCAC 2B .0235 shall have two options for ensuring protection of riparian buffers on new
27 developments within their jurisdictions as follows.

28 (a) Obtain authority to implement a local riparian buffer protection program pursuant to 15A NCAC 2B
29 .0241.

30 (b) Refrain from issuing local approvals for new development projects unless either:

31 (i) The person requesting the approval does not propose to impact the riparian buffer of a
32 surface water that appears on either the most recent versions of the soil survey maps prepared
33 by the Natural Resources Conservation Service of the United States Department of
34 Agriculture or the most recent versions of the 1:24,000 scale (7.5 minute quadrangle)
35 topographic maps prepared by the United States Geologic Survey (USGS).

1 (ii) The person requesting the approval proposes to impact the riparian buffer of a surface water
2 that appears on the maps described in Sub-Item (12)(b)(i) of this Rule and either:

- 3 (A) Has received an on-site determination from the Division pursuant to Sub-Item (3)(a)
4 of this Rule that surface waters are not present;
- 5 (B) Has received an Authorization Certificate from the Division pursuant to Item (8) of
6 this Rule for uses designated as Allowable under this Rule;
- 7 (C) Has received an Authorization Certificate from the Division pursuant to Item (8) of
8 this Rule and obtained the Division's approval on a mitigation plan pursuant to Item
9 (10) of this Rule for uses designated as Allowable with Mitigation under this Rule; or
- 10 (D) Has received a variance from the Commission pursuant to Item (9) of this Rule.

11 (13) OTHER LAWS, REGULATIONS AND PERMITS. In all cases, compliance with this Rule does not
12 preclude the requirement to comply with all federal, state and local regulations and laws.

13
14 History Note: Authority 143-214.1; 143-214.7,- 143-215.3(a)(1); S. L. 1995, c. 572;
15 *Temporary Adoption, Eff. July 22, 1997;*
16 *Temporary Amendment, Eff. June 22, 1999; April 22, 1998; January 22, 1998;*
17 *Eff. August 1, 2000.*

15A NCAC 2B .0241 is proposed for adoption as follows:

**• 0241 NEUSE RIVER BASIN: NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
DELEGATION OF AUTHORITY FOR THE PROTECTION AND MAINTENANCE OF RIPARIAN
BUFFERS**

(a) **PURPOSE.** This Rule sets out the requirements for delegation of the responsibility for implementing and enforcing the state's riparian buffer protection program to local governments.

(b) **PROCEDURES FOR GRANTING AND RESCINDING DELEGATION.** The Commission shall grant and rescind local government delegation of the Neuse River Basin Riparian Buffer Protection requirements according to the following procedures.

- (1) Local governments within the Neuse River Basin may submit a written request to the Commission for authority to implement and enforce the State's riparian buffer protection requirements within their jurisdiction. The written request shall be accompanied by information which shows:
 - (A) The local government has land use jurisdiction for the riparian buffer demonstrated by delineating the local land use jurisdictional boundary on USGS 1:24,000 topographical map(s) or other appropriate scale map(s);
 - (B) The local government has the administrative organization, staff, legal authority, financial and other resources necessary to implement and enforce the State's riparian buffer protection requirements based on its size and projected amount of development;
 - (C) The local government has adopted ordinances, resolutions, or regulations necessary to establish and maintain the State's riparian buffer protection requirements; and
 - (D) The local government has provided a plan to address violations with appropriate remedies and actions.
- (2) Within 90 days after the Commission has received the request for delegation, the Commission shall notify the local government whether it has been approved, approved with modifications, or denied.
- (3) The Commission, upon determination that a delegated local authority is failing to implement or adequately enforce the state's riparian buffer protection requirements, shall notify the delegated local authority in writing of the local program's inadequacies. If the delegated local authority has not corrected the deficiencies within 90 days of receipt of the written notification, then the Commission shall rescind the delegation of authority to the local government and shall implement and enforce the State's riparian buffer protection requirements.
- (4) The Commission may delegate its duties and powers for granting and rescinding local government delegation of the State's riparian buffer protection requirements, in whole or in part, to the Director.

(c) **APPOINTMENT OF A RIPARIAN BUFFER PROTECTION ADMINISTRATOR.** Upon receiving delegation, local governments shall appoint a Riparian Buffer Protection Administrator who shall coordinate the implementation and enforcement of the program. The Administrator shall attend an initial training session by the Division and subsequent annual training sessions. The Administrator shall ensure that local government staff working directly with

the program receive training to understand, implement and enforce the program.

(d) **PROCEDURES FOR USES WITHIN RIPARIAN BUFFERS THAT ARE ALLOWABLE AND ALLOWABLE WITH MITIGATION.** Upon receiving delegation, local authorities shall be responsible for reviewing proposed uses within the riparian buffer and issuing approvals if the uses meet the State's riparian buffer protection requirements. Delegated local authorities shall issue an Authorization Certificate for uses if the proposed use meets the State's riparian buffer protection requirements, or provides for appropriate mitigated provisions to the State's riparian buffer protection requirements. The Division shall have the authority to challenge a decision made by a delegated local authority for a period of 30 days after the Authorization Certificate is issued. If the Division does not challenge an Authorization Certificate within 30 days of issuance, then the delegated local authority's decision will stand.

(e) **VARIANCES.** After receiving delegation, local governments shall be responsible for reviewing variance requests, providing approvals for minor variance requests and making recommendations to the Commission for major variance requests pursuant to the State's riparian buffer protection program.

(f) **LIMITS OF DELEGATED LOCAL AUTHORITY.** The Commission shall have jurisdiction to the exclusion of local governments to implement the State's riparian buffer protection requirements for the following types of activities:

- (1) Activities conducted under the authority of the State;
- (2) Activities conducted under the authority of the United States;
- (3) Activities conducted under the authority of multiple jurisdictions;

Activities conducted under the authority of local units of government.

(g) **RECORD-KEEPING REQUIREMENTS.** Delegated local authorities are required to maintain on-site records for a minimum of five years. Delegated local authorities must furnish a copy of these records to the Director within 30 days of receipt of a written request for the records. The Division will inspect local riparian buffer protection programs to ensure that the programs are being adequately implemented and enforced. Each delegated local authority's records shall include the following:

- (1) A copy of variance requests;
- (2) The variance request's finding of fact;
- (3) The result of the variance proceedings;
- (4) A record of complaints and action taken as a result of the complaint;
- (5) Records for stream origin calls and stream ratings; and

Copies of request for authorization, records approving authorization and Authorization Certificates.

History Note: Authority 143-214. 1; 143-214.7; 143-215.3(a)(1); Chapter 221, 1998 Session Laws.

15A NCAC 2B .0242 is proposed for adoption as follows:

• 0242 MITIGATION PROGRAM FOR PROTECTION AND MAINTENANCE OF RIPARIAN BUFFERS

The following are the requirements for the Riparian Buffer Mitigation Program.

- (1) **PURPOSE.** The purpose of this Rule is to set forth the mitigation requirements that apply to the State's riparian buffer protection program.
- (2) **APPLICABILITY.** This Rule applies to persons who wish to impact a riparian buffer when one of the following applies:
 - (a) A person has received an Authorization Certificate pursuant to 15A NCAC 2B .0233 for a proposed use that is designated as "allowable with mitigation."
 - (b) A person has received a variance pursuant to 15A NCAC 2B .0233 and is required to perform mitigation as a condition of a variance approval.
- (3) **THE AREA OF MITIGATION.** The required area of mitigation shall be determined by either the Division or the delegated local authority according to the following:
 - (a) The impacts in square feet to each zone of the riparian buffer shall be determined by the Division or the delegated local authority by adding the following:
 - G) The area of the footprint of the use causing the impact to the riparian buffer.
 - (ii) The area of the boundary of any clearing and grading activities within the riparian buffer necessary to accommodate the use.
 - (iii) The area of any ongoing maintenance corridors within the riparian buffer associated with the use.
 - (b) The required area of mitigation shall be determined by applying the following multipliers to the impacts determined in Sub-item (3)(a) of this Paragraph to each zone of the riparian buffer:
 - G) Impacts to Zone I of the riparian buffer shall be multiplied by 3.
 - (ii) Impacts to Zone 2 of the riparian buffer shall be multiplied by 1.5.
 - (iii) Impacts to wetlands within Zones I and 2 of the riparian buffer that are subject to mitigation under 15A NCAC 2H .0506 shall comply with the mitigation ratios in 15A NCAC 2H .0506.
- (4) **THE LOCATION OF MITIGATION.** The mitigation effort shall be located in the same Nutrient Management Zone of the Neuse River Basin of the proposed impact or lower in the basin. The four Nutrient Management Zones are laid out in the Division's Report, 'Total Maximum Daily Load for Total Nitrogen to the Neuse River Estuary, North Carolina' (February 1999).
- (5) **ISSUANCE OF THE MITIGATION DETERMINATION.** The Division or the delegated local authority shall issue a mitigation determination that specifies the required area and location of mitigation pursuant to Items (3) and (4) of this Paragraph.

- (6) **OPTIONS FOR MEETING THE MITIGATION DETERMINATION.** The mitigation determination made pursuant to Item (5) of this Paragraph may be met through one of the following options:
- (a) Payment of a compensatory mitigation fee to the Riparian Buffer Restoration Fund pursuant to Item (7) of this Paragraph.
 - (b) Donation of real property or of an interest in real property pursuant to Item (8) of this Paragraph.
 - (c) Restoration or enhancement of a riparian buffer that is not otherwise required to be protected. This shall be accomplished by the applicant after submittal and approval of a restoration plan pursuant to Item (9) of this Paragraph.
- (7) **PAYMENT TO THE RIPARIAN BUFFER RESTORATION FUND.** Persons who choose to satisfy their mitigation determination by paying a compensatory mitigation fee to the Riparian Buffer Restoration Fund shall meet the following requirements:
- (a) **SCHEDULE OF FEES:** The amount of payment into the Fund shall be determined by multiplying the acres or square feet of mitigation determination made pursuant to Item (5) of this Paragraph by ninety-six cents per square foot or forty-one thousand, six hundred and twenty-five dollars per acre.
 - (b) The required fee shall be submitted to the Division of Water Quality, Wetlands Restoration Program, P.O. Box 29535, Raleigh, NC 27626-0535 prior to any activity that results in the removal or degradation of the protected riparian buffer for which a "no practical alternatives" determination has been made.
 - (c) The payment of a compensatory mitigation fee may be fully or partially satisfied by donation of real property interests pursuant to Item (8) of this Paragraph.
 - (d) The fee outlined in Sub-item (7)(a) of this Paragraph shall be reviewed every two years and compared to the actual cost of restoration activities conducted by the Department, including site identification, planning, implementation, monitoring and maintenance costs. Based upon this biennial review, revisions to Sub-item (7)(a) of this Paragraph will be recommended when adjustments to this Schedule of Fees are deemed necessary.
- (8) **DONATION OF PROPERTY.** Persons who choose to satisfy their mitigation determination by donating real property or an interest in real property shall meet the following requirements:
- (a) The donation of real property interests may be used to either partially or fully satisfy the payment of a compensatory mitigation fee to the Riparian Buffer Restoration Fund pursuant to Item (7) of this Paragraph. The value of the property interest shall be determined by an appraisal performed in accordance with Sub-item (8)(d)(iv) of this Paragraph. The donation shall satisfy the mitigation determination if the appraised value of the donated property interest is equal to or greater than the required fee. If the appraised value of the donated property interest is less than the required fee calculated pursuant to Sub-item (7)(a) of this Paragraph, the applicant shall pay the remaining balance due.

- (b) The donation of conservation easements to satisfy compensatory mitigation requirements shall be accepted only if the conservation easement is granted in perpetuity.
- (c) Donation of real property interests to satisfy the mitigation determination shall be accepted only if such property meets all of the following requirements:
 - (i) The property shall be located within an area that is identified as a priority for restoration in the Basinwide Wetlands and Riparian Restoration Plan or shall be located at a site that is otherwise consistent with the goals outlined in the Basinwide Wetlands and Riparian Restoration Plan.
 - (ii) The property shall contain riparian buffers not currently protected by the State's riparian buffer protection program that are in need of restoration.
 - (iii) The restorable riparian buffer on the property shall have a minimum length of 1000 linear feet along a surface water and a minimum width of 50 feet as measured horizontally on a line perpendicular to the surface water.
 - (iv) The size of the restorable riparian buffer on the property to be donated shall equal or exceed the acreage of riparian buffer required to be mitigated under the mitigation responsibility determined pursuant to Item (3) of this Paragraph.
 - (v) The property shall not require excessive measures for successful restoration, such as removal of structures or infrastructure. Restoration of the property shall be capable of fully offsetting the adverse impacts of the requested use;
 - (vi) The property shall be suitable to be successfully restored, based on existing hydrology, soils, and vegetation;
 - (vii) The estimated cost of restoring and maintaining the property shall not exceed the value of the property minus site identification and land acquisition costs.
 - (ix) The property shall not contain cultural or historic resources.
 - (x) The property shall not contain any hazardous substance or solid waste.
 - (xi) The property shall not contain structures or materials that present health or safety problems to the general public. If wells, septic, water or sewer connections exist, they shall be filled, remediated or closed at owner's expense in accordance with state and local health and safety regulations.
 - (xii) The property shall have the potential to remove nitrogen, improve water quality and enhance natural resources after restoration. The Division shall consider whether the property is adjacent to or includes:
 - (A) a Department-approved restoration or preservation project or public lands;
 - (B) a sensitive natural resource, as identified in the Basinwide Wetland and Riparian Restoration Plan;

- (C) known occurrences of rare species as identified by the North Carolina Natural Heritage Program in the "Natural Heritage Program List of Rare Animal Species of North Carolina" or the "Natural Heritage Program List of the Rare Plant Species of North Carolina;"
 - (D) significant Natural Heritage Area as identified by the North Carolina Natural Heritage Program in the "North Carolina Natural Heritage Program Biennial Protection Plan, List of Significant Natural Heritage Areas." Copies of these documents may be obtained from the Department of Environment and Natural Resources, Division of Parks and Recreation, Natural Heritage Program, P.O. Box 27687, Raleigh, North Carolina 2761 1;
 - (E) federally or state-listed sensitive, endangered, or threatened species, or their critical habitat;
 - (F) non-supporting, partially supporting, or support-threatened waters as designated by the Division pursuant to 40 CFR 131.10(a) through (g). This material is available at the Department of Environment and Natural Resources, Division of Water Quality, Water Quality Section, 512 North Salisbury Street, Raleigh, North Carolina 27604;
- (xiii) The property and adjacent properties shall not have prior, current, and known future land use that would inhibit the function of the restoration effort.
- (xiv) The property shall not have any encumbrances or conditions on the transfer of the property interests.
- (d) At the expense of the applicant or donor, the following information shall be submitted to the Division with any proposal for donations or dedications of interest in real property:
- (i) Documentation that the property meets the requirements laid out in Sub-Item (8)(c) of this Paragraph.
 - (ii) US Geological Survey 1:24,000 (7.5 minute) scale topographic map, county tax map, USDA Natural Resource Conservation Service County Soil Survey Map, and county road map showing the location of the property to be donated along with information on existing site conditions, vegetation types, presence of existing structures and easements.
 - (iii) A current property survey performed in accordance with the procedures of the North Carolina Department of Administration, State Property Office as identified by the State Board of Registration for Professional Engineers and Land Surveyors in "Standards of Practice for Land Surveying in North Carolina." Copies may be obtained from the North Carolina State Board of Registration for Professional Engineers and Land Surveyors, 3620 Six Forks Road, Suite 300, Raleigh, North Carolina 27609.
 - (iv) A current appraisal of the value of the property performed in accordance with the procedures

of the North Carolina Department of Administration, State Property Office as identified by the Appraisal Board in the "Uniform Standards of Professional North Carolina Appraisal Practice." Copies may be obtained from the Appraisal Foundation, Publications Department, P.O. Box 96734, Washington, D.C. 20090-6734.

- (v) A title certificate.
- (9) **RIPARIAN BUFFER RESTORATION OR ENHANCEMENT.** Persons who choose to meet their mitigation requirement through riparian buffer restoration or enhancement shall meet the following requirements:
- (a) The applicant may restore or enhance a riparian buffer that is not protected under the State's riparian buffer protection program if either of the following applies:
 - G) The area of riparian buffer restoration is equal to the required area of mitigation determined pursuant to Item (3) of this Paragraph.
 - (ii) The area of riparian buffer enhancement is three times larger than the required area of mitigation determined pursuant to Item (3) of this Paragraph.
 - (b) The location of the riparian buffer restoration or enhancement shall comply with the requirements in Item (4) of this Paragraph.
 - (c) The riparian buffer restoration or enhancement site shall have a minimum width of 50 feet as measured horizontally on a line perpendicular to the surface water.
 - (d) The applicant shall first receive an Authorization Certificate for the proposed use according to the requirements of 15A NCAC 2B .0233. After receiving this determination, the applicant shall submit a restoration or enhancement plan for approval by the Division. The restoration or enhancement plan shall contain the following.
 - G) A map of the proposed restoration or enhancement site.
 - (ii) A vegetation plan. The vegetation plan shall include a minimum of at least two native hardwood tree species planted at a density sufficient to provide 320 trees per acre at maturity.
 - (iii) A grading plan. The site shall be graded in a manner to ensure diffuse flow through the riparian buffer.
 - (iv) A fertilization plan.
 - (v) A schedule for implementation.
 - (e) Within one year after the Division has approved the restoration or enhancement plan, the applicant shall present proof to the Division that the riparian buffer has been restored or enhanced. If proof is not presented within this timeframe, then the person shall be in violation of the State's or the delegated local authority's riparian buffer protection program.
 - (f) The mitigation area shall be placed under a perpetual conservation easement whose terms are acceptable to the Division.

- (g) The applicant shall submit annual reports for a period of five years after the restoration or enhancement showing that the trees planted have survived and that diffuse flow through the riparian buffer has been maintained. The applicant shall be responsible for replacing trees that do not survive and for restoring diffuse flow if needed during that five-year period.

History Note: *Authority 143-214. 1; 143-214.7; 143-215.3(a)(1); Chapter 221, 1998 Session*

Laws.

Temporary Adoption, Eff. June 22, 1999;

Eff. August 1, 2000.

APPENDIX C – Town Code Nuisance Ordinance

HEALTH AND SANITATION

ARTICLE I. IN GENERAL

Secs. 6-1--6-15. Reserved.

ARTICLE II. NOXIOUS WEEDS AND GRASS AND SIMILAR NUISANCES

Sec. 6-16. Procedures in article not exclusive.

The procedures set forth in this article shall be in addition to any other remedies that may now or hereafter exist under law for the abatement of public nuisances, and this article shall not prevent the town from proceeding in a criminal action against any person violating the provisions of this article as provided in General Statutes, section 14-4.

(Ord. No. 1198, § 7, 6-17-69)

Sec. 6-17. Nuisances declared.

The following enumerated and described conditions are hereby found, deemed and declared to constitute a detriment, danger and hazard to the health, safety, morals and general welfare of the inhabitants of the town and are found, deemed and declared to be public nuisances wherever the same may exist and the creation, maintenance or failure to abate any nuisances is hereby declared unlawful:

- (1) Any condition which is a breeding ground or harbor for mosquitoes or a breeding ground or harbor for rats, snakes, or other pests, or has the potential for becoming a breeding ground or harbor for such pests;
- (2) A place of heavy growth of weeds or grasses over twelve (12) inches in height which lie less than one hundred (100) feet from any abutting open street or which lies less than one hundred (100) feet from any adjoining property line which contains a structure, or is a place of heavy growth of weeds or grasses over twelve (12) inches in height which lies within fifty (50) feet of any occupied dwelling; provided, that the nuisance defined by this subsection (2) shall be cleared and cut to the satisfaction of the town manager or his designee;
- (3) A place of vines, shrubs or other vegetation over eight (8) inches in height when such vines, shrubs or vegetation are a focal point for any other nuisance enumerated in this Code; provided, that the nuisance herein defined by this subsection (3) shall be cleared and cut only when it is necessary to abate any other nuisance described in this section;
- (4) A place of growth of noxious vegetation, including poison sumac (*Rhus vernix*), poison ivy (*Rhus radicans*) or poison oak (*Rhus toxicodendron*), in a location likely to be accessible to the general public;
- (5) An open place of collection of water for which no adequate natural drainage is provided and where insects tend to breed or which is or is likely to become a nuisance or a menace to public health;
- (6) An open place of concentration of combustible items such as mattresses, boxes, paper, automobile tires and tubes, trash, refuse, brush, old clothes, rags or any other combustible materials or objects of a like nature;
- (7) Is an open place of collection of garbage, food waste, animal waste or any other rotten or putrescible matter of any kind;
- (8) Privies;
- (9) Hides, dried or green, provided the same may be kept for sale in the town when thoroughly cured and odorless;

- (10) Any furniture, appliances, automotive parts or pieces or other wood or metal products of any kind or nature openly kept which have jagged edges of metal or glass, or areas of confinement, or areas which may provide a habitat for rats, snakes, insects or other pests;
- (11) Any improper or inadequate drainage on private property which causes flooding, interferes with the use of, or endangers in any way the streets, sidewalks, parks or other Town owned property of any kind;
- (12) Any stormwater retention or detention pond or other impoundment device which is operating improperly;
- (13) Any stormdrain, sewer manhole, abandoned well or other private or public facility which is not properly covered with a grate or other means to remove any hazard to pedestrians or motor traffic;
- (14) Any ditch, trench or below ground portion of a construction project which remains open for more than fourteen (14) days without being completed or which is not protected with barricades, flags or other means so as to constitute a hazard to pedestrians or motor traffic;
- (15) Failure to clean or clear a public street of mud and debris related to a construction, timbering or other similar land use project within twelve (12) hours after notification by the town manager or his designee for major and minor thoroughfares or within twenty-four (24) hours after such notification for collector and local streets; however, if it is found by the town manager or his designee that the situation is causing a clear and present danger or hazard to traffic or the general public, such cleaning or clearing may be required to take place as soon after notification as practicable;
- (16) Any condition which violates the rules and regulations of the Wake County Health Department; or
- (17) Any other condition specifically declared to be a danger to the public health, safety, morals and general welfare of inhabitants of the city and a public nuisance by the board of aldermen, which proceeding may be initiated by the town manager or his designee before the board after giving written notice thereof. Such notice shall state the condition existing, the location and that the board will be requested on a day certain, after a public hearing at which the person notified may appear and be heard, to declare that the conditions existing constitute a danger to the public health, safety, morals and general welfare of the inhabitants of the city and a public nuisance. After such declaration by the board in the form of an ordinance, the condition will be abated as provided for in this chapter, provided no administrative appeal shall lie from a proceeding pursuant to the subsection and initiated by the town manager or his designee before the board of aldermen.
(Ord. No. 1198, § 1, 6-17-69; Ord. No. 2362, §§ 1--3, 6-5-89; Ord. No. 2479, § 1, 5-6-91)

Sec. 6-18. Duty to cause investigation of possible nuisances.

The town manager, or his designee, upon notice from any person of the existence of any of the conditions described in this article, shall cause to be made by the appropriate county health department official or town official such investigation as may be necessary to determine whether in fact such condition exists as to constitute a public nuisance.

(Ord. No. 1198, § 2, 6-17-69; Ord. No. 2479, § 2, 5-6-91)

Sec. 6-19. Nuisance abatement inspection fee.

Pursuant to General Statutes, section 160A-414, a fee for inspecting nuisances defined in this article shall be charged to the owner of such lot or parcel of land. It shall be the duty of the tax collector to mail a statement of such fee to the owner or other person in possession of such premises with instructions that such fee is due and payable within thirty (30) days from the receipt thereof.

- (1) Fees enumerated. The fee for such inspections is set out in the Fees and Charges Ordinance.
- (2) Extra inspections. The fee referenced above entitles the permittee to an initial inspection plus one (1) additional inspection for the corrected work. For each inspection in excess of these, there shall be an additional charge.
(Ord. No. 1930, § 1, 6-25-84; Ord. No. 2357, § 2, 5-16-89)

Sec. 6-20. Duty to give notice of existence of nuisance and require abatement.

- (a) Upon a determination that a public nuisance as described in this article exists, the town manager or his designee shall notify in writing the owner, occupant or person in possession of the premises in question of the condition constituting such public nuisance and shall order the prompt abatement thereof within ten (10) days from the receipt of such written notice.
- (b) Within the ten-day period mentioned in subsection (a) above, the owner of the property where the nuisance exists may appeal the findings of the town manager or his designee made pursuant to subsection (a) above to the board of aldermen by giving written notice of appeal to the town clerk. The filing of the appeal shall stay the abatement of the nuisance by the town until a final determination by the board, unless the town manager or his designee certifies to the board that, because of the facts stated in the certificate, a stay would, in his opinion, cause imminent peril to life or property or that, because the violation is transitory in nature, a stay would seriously interfere with the effective enforcement of this chapter. In that case, abatement proceedings shall not be stayed except by order of the board of aldermen or a court, issued on application of the party seeking the stay, for due cause shown, after notice to the town manager or his designee. In the event no appeal is taken, the town may proceed to abate the nuisance.
- (c) The board, in the event an appeal is taken as provided in subsection (b) above and after hearing all interested persons and reviewing the findings of the town manager or his designee, may reverse the findings made pursuant to subsection (a) above; but if the board shall uphold the findings of the town manager or his designee made pursuant to such subsection, the board shall adopt an ordinance specifically declaring the condition existing on the property to be a danger and hazard to the health, safety, morals and general welfare of the inhabitants of the town and a public nuisance and directing the appropriate town employees to cause the condition or conditions to be abated.
- (d) If any of the above-defined nuisances are found to exist, the responsibility for abatement shall rest with the owner, occupant or person in possession of the property or their agent, notwithstanding that the nuisance is found to exist, wholly or in part, within a town easement which crosses private property.
(Ord. No. 1198, § 3, 6-17-69; Ord. No. 1930, § 2, 6-25-84; Ord. No. 2362, § 4, 6-5-89; Ord. No. 2479, §§ 3, 4, 5-6-91)

Sec. 6-21. Abatement of nuisance by town; violator may have town abate nuisance.

- (a) If any person, after having been ordered to abate a public nuisance described in this article, fails, neglects or refuses to abate or remove the condition constituting the nuisance within ten (10) days from receipt of the order, the town manager or his designee shall cause the condition to be removed or otherwise remedied by having employees of the town or a private contractor hired by the town go upon such premises and remove or otherwise abate such nuisance under the supervision of an officer or employee designated by the administrative officer. In such instances, weeds or grass shall always be cut to a height satisfactory to the manager or his designee.
- (b) Any person who has been ordered to abate a public nuisance may within the time allowed by this article request the town in writing to remove such condition, the cost of which shall be paid by the person making such request.

Ord. No. 1198, § 4, 6-17-69; Ord. No. 1587, § 1, 6-4-79; Ord. No. 1930, § 2, 6-25-84; Ord. No. 2479, § 5, 5-6-91)

Sec. 6-22. Cost of nuisance abatement to be charged to owner of premises; statement of charges.

The actual cost incurred by the town in removing or otherwise remedying a public nuisance defined in this article shall be charged to the owner of such lot or parcel of land, and it shall be the duty of the tax collector to mail a statement of such charges to the owner or other person in possession of such premises with instructions that such charges are due and payable within thirty (30) days from the receipt thereof.

(Ord. No. 1198, § 5, 6-17-69; Ord. No. 1930, § 2, 6-25-84)

Sec. 6-23. Lien created upon failure to pay nuisance abatement costs.

In the event charges for the removal or abatement of a public nuisance described by this article are not paid within thirty (30) days after the receipt of the statement of charges as provided for in section 6-22, such charges shall become a lien upon the land or premises where the public nuisance existed and shall be collected as unpaid taxes.

(Ord. No. 1198, § 6, 6-17-69; Ord. No. 1930, § 2, 6-25-84)

Sec. 6-24. Second and subsequent violations.

Upon second and subsequent violations of this article, no notice of the violation as required in section 6-20 shall be given, but the town, through its agents and employees, may enter upon such lots or premises and cut and destroy such weeds, and the cost and expense thereof shall be paid by the owner, lessee, occupant or agent, or it shall become a lien against the property the same as taxes.

(Ord. No. 1198, § 8, 6-17-69; Ord. No. 1930, § 2, 6-25-84)

Sec. 6-25. Civil penalty provided.

- (a) A violation of any provision of this section [article] shall constitute a misdemeanor punishable as provided in section 1-8 or a civil penalty as set forth below.
- (b) A violation of any provision of this section [article] shall subject the offender to a civil penalty in the amount of fifty dollars (\$50.00). No penalty shall be imposed if the offender abates the nuisance within the prescribed time or requests the town to abate the nuisance as allowed in section 6-21(b). If the offender does not abate the nuisance within the prescribed time limit, the penalty may be imposed for each day the nuisance remained after the written notice of violation was given and terminating on the date the nuisance was abated by the town.
- (c) The offender shall be issued a written citation by delivery in person or mailed by certified or registered mail. The civil penalty must be paid within ten (10) days of its receipt by the offender.
- (d) The penalty may be recovered by the town in a civil action in the nature of debt if the offender does not pay the penalty within the prescribed period of time after he or she has been issued a citation.

(Ord. No. 2479, § 6, 5-6-91)

ORDINANCE NO. (2000) 3009

AN ORDINANCE TO AMEND THE NUISANCES SECTION OF THE TOWN CODE

WHEREAS, the Board of Aldermen finds that certain municipalities including the Town of Garner are required by newly enacted state laws to undertake enhanced enforcement of maintenance of stormwater quality control devices within both the Town limits and the Extraterritorial Jurisdiction;

BE IT THEREFORE ORDAINED by the Board of Alderman of the Town of Garner as follows:

Section One. That Section 6-17, subparagraph (12) captioned "Nuisances declared," read as follows:

- (12) Any stormwater retention or detention pond or other impoundment device or stormwater quality control device, which is operating improperly; provided further, that this subsection applies in the Town's extraterritorial jurisdiction as well as within the Town limits;

Section Two. That this ordinance shall be effective upon adoption.

This the 5th day of March, 2001.

APPENDIX D – Ogden Report

ADDENDUM 1.

NUTRIENT MANAGEMENT STRATEGY: TECHNICAL BASIS FOR THE TOWN OF GARNER'S APPROACH

On December 11, 1997 the North Carolina Environmental Management Commission (EMC) adopted permanent rules to support implementation of the Neuse River Nutrient Sensitive Waters Management Strategy (Neuse NSW Strategy). The goal of the strategy is to achieve a 30 percent nitrogen reduction from each controllable and quantifiable source of nitrogen in the basin. These sources of nitrogen are point source discharges associated with wastewater treatment plants and nonpoint source discharges associated with agriculture operations and urban stormwater runoff. As part of the rules fifteen local governments in the Neuse Basin, including Garner, are required to implement local stormwater management plans aimed at achieving the 30 percent nitrogen reduction goal as it relates to the nonpoint urban stormwater runoff component.

The Town of Garner plans to implement a stormwater management program that follows the guidance of the model program developed by the staff of the Division of Water Quality and the municipal stakeholders group. The Town of Garner's implementation of the water supply watershed protection program for the Lake Benson Retention Pond Service District (RPSD) also benefits the Town in its implementation of a stormwater management plan for nutrient management. The RPSD is providing a reduction in the delivery of total nitrogen to Swift Creek, Lake Benson, and the Neuse River. The following paragraphs describe this reduction and how it impacts the Town's implementation of the stormwater management requirement.

Approach

The key issue of the stormwater management requirements is the control and/or reduction of the export of total nitrogen to the streams and surface water bodies of the Neuse River Basin. New development densities that exceed the mandated 3.6 pounds/acre/year export threshold for total nitrogen must implement controls that meet this criteria and/or pay a fee to the Wetlands Restoration Program. Under this rule riparian buffers adjacent to perennial or intermittent streams are to be preserved.

The approach to be taken in the Town of Garner is two-pronged. First, the Town intends to implement most of the components of the State's model stormwater management plan with only minor modifications except in the RPSD. Second, within the RPSD, new development with imperviousness intensity greater than the equivalent of one dwelling unit per acre will receive a total nitrogen export credit as a result of the publicly financed regional pond.

Model Data

The water quality modeling that was performed during the development of the water supply watershed protection program for Lake Benson was utilized in the analysis of the RPSD for the nutrient management strategy. All of the nonpoint source load information and removal of total nitrogen by the regional pond came from that study, dated June 30, 1993. A description of the model used in the study is attached to this document.

The modeling effort provided load reduction estimates for the existing lake in R9 as well as for the entire basins for R7, R8, and R9. The nonpoint source loads shown in Table 1 are cumulative nonpoint source loads for total nitrogen that would be discharged to Lake Benson from the four basins. The table provides information on existing conditions and 100 percent build out based on the Planning Department's projections of future land uses in these basins.

Both existing and future conditions were subjected to the three possible regional pond scenarios. The two pond and three pond options were deemed economically infeasible during the original study. The first line of data in Table 1 represents existing conditions without regional ponds. The following three lines represent the conditions estimated to exist under the three regional ponds treating the nonpoint source pollutant loads from all four basins. For existing conditions it is significant to note that the loads are lower in each of the control scenarios than under existing conditions due to the fact that runoff from areas of existing development is being treated under these plans.

In the future conditions analysis, it is shown that under each control program the total nonpoint source loads of total nitrogen being discharged to Lake Benson are lower than would be discharged under uncontrolled conditions.

TABLE 1. LAKE BENSON WATERSHED PROTECTION STUDY MANAGEMENT ALTERNATIVE SUMMARY				
	ANNUAL LOADS (tons/year)			
	Existing Conditions		Future Conditions	
	TSS	TN	TSS	TN
Uncontrolled	1,749	29.4	2,193	35.6
Pond R7	1,372	28.5	1,737	34.5
Pond R8	1,251	28.4	1,608	34.3
Pond R9	1,464	28.9	1,883	34.6
With On-Site Controls			1,855	34.1

The RPSD approach provides a significant regional reduction in the export of total nitrogen to Lake Benson, Swift Creek, and the Neuse River. Table 2 provides information for each of the three ponds including the annual removal of total nitrogen and the removal of total nitrogen on a unitized basis for the 923 acres zoned for new development at a density greater than one dwelling per acre in the RPSD. Under the Stormwater Management Program being developed by the Town of Garner, each of these 923 acres will receive a credit for the removal of total nitrogen based on the unitized removal rate of the pond(s) actually constructed. If the unitized total nitrogen load from the property is still greater than 3.6 pounds/acre/year after applying the credit then the new development will be required to utilize on-site or sub-regional controls, payment of fees to the Wetlands Restoration Fund, or both.

TABLE 2. TOTAL NITROGEN REMOVAL - UNIT RATES		
Pond	Pounds Removed	Unit Removal Rate
7L	1460	1.6
8L	1860	2.0
9L	1240	1.3

Results and Conclusions

The Town of Garner is adopting a stormwater management program that is based the model stormwater management program as proposed by the Division of Water Quality and the Neuse River stakeholder group. The program follows the model in many regards. There will be a credit for some new development properties within the Lake Benson Regional Pond Service District. The credit will be applied as described in the following paragraphs.

- 1 Those properties that will be developed inside the Regional Pond Service District at a density greater than one residence per acre will receive a credit computed as the annual average removal of total nitrogen by the regional pond(s) divided by the total area of such parcels (923 acres). This credit will be:
 - 2.0 pounds per acre per year if pond R8 is constructed.
 - 1.6 pounds per acre per year if pond R7 is constructed.
 - 1.3 pounds per acre per year if pond R9 is constructed.
- 2 Until a pond is selected and construction begins the minimum credit (1.3 pounds per acre per year) will be assumed.
- 3 On a case by case basis, additional on-site controls may be required for development in the RPSD in order to meet the total nitrogen export reduction requirements of the Neuse NSW Strategy.

ATTACHMENT

WATER QUALITY MODEL DEVELOPMENT

The Lake Benson Watershed Study has several objectives. Among these objectives is the management of the quality of stormwater runoff in the watershed. The stormwater quality management objective is to be met by performing the following tasks:

- identification of the parameters by which existing conditions in the basin, as well as the impact of proposed alternative management strategies, can be evaluated;
- estimation of the current status of nonpoint source pollutant loads in the basin;
- estimation of the potential changes in nonpoint source pollutant loads and their impacts resulting from the uncontrolled development of the basin;
- evaluation of the impacts of the high density development option of the water supply watershed protection rules on water quality in the watershed; and,
- determination of the most feasible program for comprehensive management of stormwater runoff quality in Garner.

The parameters used as indicators of nonpoint source loading impacts in the basin and of the status of the surface water bodies in the basin were selected so as to utilize the wealth of stormwater quality information that has been collected both regionally and nationally.

A decision to adopt the high density development option will require that either on-site wet ponds or regional wet ponds be built, or a combination of the two. If public dollars are spent on the development of a regional pond system, then the ponds should be designed as multi-purpose facilities. The evaluation of the quality of surface water bodies is generally tied to their trophic state, which is a function of oxygen availability in the lakes and the demands, both existing and potential, exerted on the available oxygen. Algae growth potential is a common measure of the trophic state of surface water bodies and is a function of the physical characteristics of the lake, the flushing rate of the lake (referred to as the hydraulic residence time), and of the nutrient availability for algae growth.

The quality of water in lakes is also measured based on the concentration of toxic materials in the water column. These compounds impact the ability of the water bodies to sustain aquatic life and accumulate in the bottom sediments of the lakes. The presence of these materials enter into the determination of the allowable uses of the lakes. There is not a large amount of data available on the concentrations of toxic materials in the local surface water bodies. The "best" data available, both regionally and nationally, are on toxic metals, therefore metals that are commonly found in stormwater runoff from urban areas are used as the indicators of potential toxic conditions in lakes.

Based on the criteria above, there are three groups of parameters that are needed for the surface water body assessments: trophic state parameters, such as chlorophyll_a and probability density functions for both blue-green algae growth and anoxic conditions; nutrient loading for phosphorus and nitrogen (needed for algal growth and density functions); and metals concentrations, of which zinc is most commonly associated with urban stormwater runoff, to be used as a measure of possible toxic conditions in the water body.

The loads of the pollutants specified above are easily developed using nonpoint source pollutant loading models. The required trophic state parameters are generated from the nutrient loads entering the water bodies, the physical characteristics of the water bodies, and

the annual surface runoff flowing through the lakes.

In order to perform the necessary evaluations two models are required. The first is a nonpoint source pollutant loading model that is used to evaluate both existing and future conditions in parts of the Lake Benson watershed (as well as the impacts of alternative management strategies on pollutant loading potential). The second model is a lake water quality model that not only helps to assess the impact of the nonpoint source pollutant loads on the wet ponds, but also is used to evaluate the impacts of the alternative stormwater quality management strategies for the watershed.

The functional requirements of the water quality models used is that they:

- be detailed enough to effectively approximate nonpoint source pollution in the Lake Benson watershed;
- be capable of modeling chemical processes in lakes; and,
- be based on sound technology while being simple to use.

The selected models meet the functional requirements listed above and are capable of providing the answers needed to meet the goals of the watershed management study. The selected models are described in the following sections.

NONPOINT SOURCE LOADING MODEL

The model selected for the estimation of nonpoint source pollutant loads is an adaptation of the "Simple Method" developed by the Metropolitan Washington Council of Governments (Schueler, 1987). The basic methodology of this approach is used widely throughout the United States. EPA (USEPA, 1990) adopted a similar method in the development of a strategy for nonpoint source pollution management. Variations on this approach have also been used previously in the Piedmont region of North Carolina.

The Simple Method was chosen for several reasons, most notably its ease of application and the lack of existing pertinent stormwater quality data for the Lake Benson watershed. Nonpoint source loads are computed by the Simple Method using Equation 1 below:

$$L_n = R \cdot R_v \cdot A \cdot EMC_n \cdot k \quad (1)$$

where: L_n = nonpoint source load of pollutant n, in pounds
 R = rainfall depth, in inches
 R_v = runoff coefficient
 A = area, in acres
 EMC_n = event mean concentration of pollutant n, in mg/l
 k = conversion constant, = 0.227

The Simple Method is an application developed from the results of the Nationwide Urban Runoff Program, NURP, (USEPA, 1983) and from regression equations, such as the Tasker-Driver equations (Tasker, 1988), that have been developed for estimating the nonpoint source pollutant loads associated with the annual runoff from rainfall in urban areas. The method can be used to estimate the nonpoint source pollutant load in stormwater runoff for individual events or from either seasonal or annual runoff. As input this method utilizes rainfall depth, impervious fraction, annual runoff coefficient (fraction of storms annually that produce runoff), and the event mean concentration, or EMC, of the pollutants to be modeled.

Event mean concentration values for commonly detected urban stormwater pollutants are available from a variety of sources. The EMCs published in the results of the NURP program

are the most widely used values and were used in this study. These values have been recommended by EPA for use in the development of non-point source load estimates for preparing the second part of the municipal stormwater discharge permit application (if statistically significant storm event sampling results are not available). Additional sources of event mean concentration information are also available and were reviewed, including studies by Ellis (1986), Jewell (1980), Marsalek (1989), and the Northern Virginia Planning District Commission (1979). The event mean concentration represents the long term mean concentration of a particular pollutant in stormwater runoff, and is equal to the total load of the pollutant divided by the total volume of runoff.

For the Lake Benson stormwater management study, the Simple Method was used to estimate annual nonpoint source pollutant loads in the watershed. For the study the model package was adapted for use with *Quattro Pro for Windows*[™], a commonly available micro-computer spreadsheet application. The water quality model estimates both existing and future conditions nonpoint source loads and simulates in-stream conditions in the drainage system. Alternative management programs for the watershed can be tested very rapidly.

The model uses the Simple Method to compute the annual unit loads for four nonpoint source pollution parameters in the local surface runoff. The four pollutants modelled are total phosphorus, total nitrogen, total suspended solids, and total zinc. For each pollutant, the nonpoint source load model is used to generate the surface washoff load, or manageable load, for each land use in a sub-basin. The pollutant loads and surface runoff volumes are then accumulated for both impervious and pervious areas in the sub-basin.

The drainage system simulation module routes the sub-basin loads through the drainage system, incorporating the system lake model described in the next section. This module allows for the simultaneous comparison of three scenarios; existing conditions, future conditions, and a management program. As input, this module uses nonpoint source loads, hydraulic connectivity of the sub-basins, lake data, and a management scenario. The system connectivity and the lake model input data allow simulation of discharge volumes and pollutant loads through the system. The module reads the existing and future conditions nonpoint source pollutant loads and runoff volumes, by sub-basin, from the loading model spreadsheet.

This module performs two kinds of pollutant removal computations. The first set of removal computations approximates the settling and nutrient uptake processes of the lakes. The input load to the on-line lakes is the sum of the accumulated surface pollutant loads. Regional wet ponds and existing significant lakes that are in the drainage conveyance system are simulated using this approach due to the need to have a sustained permanent pool.

The second family of pollutant removal functions takes a lumped, or "black box" approach to pollutant removal. In this set of computations the user specifies the fraction of the local sub-basin's total area to be treated by the management practices. Only the increase in surface nonpoint source pollutant load (the difference between the existing and future conditions loads) is subjected to the treatment. The load reduction is governed by user-supplied removal efficiencies for the four pollutants, or by default efficiencies as defined by EPA (USEPA, 1990). This option was used to model on-site control alternatives.

LAKE MODEL

In order to determine the impacts of continued development in the Lake Benson watershed on the quality of the regional wet detention ponds, several model characteristics were required. The model needed to be able to indicate the trophic state of the ponds; to evaluate the potential for the presence of toxic materials in the ponds, and to determine the ponds' effectiveness at removing the modeled pollutants.

During the process of selecting a lake modeling method for nutrient uptake and lake eutrophication, two procedures that have been used in the Piedmont Region of North Carolina were investigated. These procedures were lake models developed by the Corps of Engineers (Walker, 1985) and by Duke University (Reckow, 1988). The Corps' study was based on information and ambient water quality data collected at 299 major impoundments on the North American continent. The Duke University study was based on similar information and data that were collected at 80 impoundments in the southeastern United States.

The two modeling methods have very similar data requirements and each provides estimates of the information needed for this study. The differences between the two approaches lie in the algorithms developed by the models' authors and the numerical exponents and coefficients that resulted from the analyses. The Corps' analysis was based on data from lakes that were very large, for the most part very deep, and that included lakes from northern climates. The lakes included in Reckow's analysis were not as large or as deep as those in the study by Walker, and all were in the southeastern United States where the climatological aspects of the studied lakes were similar. Because the Duke University study was based on lakes in this region and on lakes having moderate to high sedimentation potential, it was decided that the Reckow model was preferable to the Walker model for use in the Lake Benson watershed study.

Nutrient Model

The model used for determining nutrient concentrations in lakes is a continuously-stirred tank reactor model, as shown in Equation 2. In the steady state, which is the assumed case, the derivative on left side of the equation is set to zero. Solving this equation for the lake nutrient concentration, C , Equation 3 is derived. Dividing Equation 3 by the annual runoff volume through the lake, Q , develops the final model, which is shown in Equation 4.

$$V \left(\frac{dC}{dt} \right) = M - Q \cdot C - k \cdot C \cdot V \quad (2)$$

$$C = [M / Q] + [M / (k \cdot V)] \quad (3)$$

$$C = C_{in} / [1 + (k \cdot T_w)] \quad (4)$$

where: C = lake nutrient concentration, in mg/l
 V = lake volume, in cubic meters
 M = annual nutrient mass loading, in grams per year
 Q = annual water loading, in cubic meters per year
 k = nutrient trapping parameter, 1/year
 $M / Q = C_{in}$ = average influent concentration, in mg/l
 $V / Q = T_w$ = hydraulic detention time, in years

All but one of the parameters of the final model are obtained from the results of the nonpoint source pollutant load models and from the physical characteristics of the lakes. The exception is the trapping coefficient, k , for phosphorus and nitrogen. Reckow's analysis of the southeastern lake data led to the development of Equations 5 and 6 for the nutrient trapping efficiencies.

$$k_P = 3.0 \cdot P_{in}^{0.53} \cdot T_w^{-0.075} \cdot z^{0.58} \quad (5)$$

$$k_N = 0.67 \cdot T_w^{-0.075} \quad (6)$$

where: $k_{P,N}$ = nutrient trapping parameter for phosphorus, nitrogen
 P_{in} = C_{in} = average influent concentration of phosphorus, in mg/l
 z = average lake depth, in meters

Trophic State Model

In order to address the impacts of the nutrient loads on the lakes in the basin, indicators of the lakes' health are needed. The most commonly used indicators are the lakes' trophic states, which are indicative of the level of eutrophication that exists or is anticipated, and the oxic condition of the lakes, which are indicative of the oxygen available for use by fish and other aquatic organisms. The trophic state is commonly evaluated by using the index developed by EPA (USEPA, 1974), which correlates the presence of chlorophyll_a to the eutrophication state of the lake. The scale developed by EPA is shown in the table below.

Eutrophication Index	
Chlorophyll_a (μ g/l)	Trophic State
0-7	Oligotrophic
7-12	Mesotrophic
> 12	Eutrophic

In order to utilize the eutrophication index of EPA, an estimate must be made of the maximum chlorophyll_a concentration likely to exist during an average year. The physical information on the lakes and ponds in the drainage basin and the results of the nonpoint source pollutant loading model are used with the predictive function that has been developed by Reckow. This function, shown in Equation 7, predicts the annual maximum chlorophyll_a concentrations in southeastern lakes.

$$\ln(\text{chlor } a)_{\max} = 1.314 + 0.384 \cdot \ln(N) + 0.321 \cdot \ln(P) + 0.136 \cdot \ln(T_w) + 0.450 \cdot \ln(n_{CA}) \quad (7)$$

where: $\text{chlor } a$ = chlorophyll_a concentration, in μ g/l
 n_{CA} = total number of chlorophyll_a samples per lake

Two indices of the possibility that anoxic conditions will develop in the hypolimnion layer of the lakes were developed in the study of southeastern lakes. One index is based on the probability that blue-green algae will dominate algal growth in the lake. Dominance by blue-

green algae was found to be indicative of probable anoxic conditions. The study results show that there is a 75% probability of anoxic conditions if blue-green algae dominate. This index is a discriminant function and is defined in Equation 8. If the value of the discriminant function is positive, the lake is classified as blue-green dominant. If the value is negative, the lake is classified as non-blue-green dominated. The probability that there will be blue-green algal dominance is computed from the discriminant function using Equation 9. The study reports a 28 percent error rate in lake classification using this methodology.

$$df_{BG} = 4.43 - 2.05 \cdot \ln(N_{in}) + 3.09 \cdot \ln(P_{in}) + 1.14 \cdot \ln(T_w) \quad (8)$$

$$Prob_{BG} = 1 / [1 + \exp(-df_{BG})] \quad (9)$$

where: df_{BG} = algal dominance discriminant function
 $Prob_{BG}$ = probability that a lake is dominated by a blue-green algal species

The second index is based on a direct analysis of the dissolved oxygen content of the lakes in Reckow's study. This index is a discriminant function for anoxic conditions. If the value of the discriminant function, computed using Equation 10, is negative, the lake is classified as oxic. If the value is positive, the lake is classified as anoxic. The probability of anoxic conditions can be directly computed (replace df_{BG} in Equation 9 with df_{AN}).

$$df_{AN} = 1.90 + 0.459 \cdot \ln(N_{in}) + 2.21 \cdot \ln(P_{in}) + 1.14 \cdot \ln(T_w) + 1.14 \cdot \ln(z) \quad (10)$$

where: df_{AN} = oxic-anoxic discriminant function

Toxic Materials (Metals) Model

As mentioned in the sections above, the fate of metals in a surface water body can be used as an indicator of how other toxic materials will act in the lakes. When evaluating the impact of lakes on metals concentrations, the basic assumption is generally that the dissolved fraction of the metals will not be impacted, or that 100 percent of the dissolved metals load is passed through the lake. This means that the effectiveness of the lake at removing metals from the water column is associated only with the suspended fraction of the metals load. In order to assess the effectiveness of the lakes in metals removal, a method that models the settling of suspended loads is needed.

The most commonly applied models for estimating the settling of suspended metals are quiescent settling models (Woodward-Clyde, 1986). These models assume that settling occurs during non-turbulent periods in the lake, and is a function of the suspended metals trapping efficiency of the lake, the settling velocity of the particles, the mean depth of the lake, and the hydraulic residence time of the lake. If, for example, we assume that 90 percent of the metals concentration is suspended, and that the trapping efficiency of the lake is 90 percent, then the maximum possible removal of metals by the lakes would be the product of these two numbers, or 81 percent. In order for the maximum removal potential to be realized in any lake, the mean hydraulic residence time of the lake, T_w , must be greater than the mean maximum settling time, t_s , which is the mean depth of the lake divided by the average settling velocity of the metal particles. If the hydraulic residence time is greater than t_s , 100 percent of the potential removal is realized (81%). If T_w is half of t_s , only 50 percent of the potential is assumed to be realized (40.5%). This relationship is shown for zinc in Equations 11, 12, and 13.

In order to evaluate the results of the metals model, an appropriate set of water quality criteria were selected. The general water quality standards for the State of North Carolina are applicable to the entire Lake Benson watershed. The in-stream standard for zinc is 0.050 milligrams per liter and is used in the study as the basis for determining the overall quality of the lakes related to metals and other toxic materials.

$$Zn_{out} = Zn_{in} - Zn_{sol} - Zn_{set} \quad (11)$$

$$Zn_{set} = \left(Zn_{in} - Zn_{sol} \right) \cdot e_{trap} \cdot \text{MIN}[1 , T_w / t_s] \quad (12)$$

$$t_s = z / V_s \quad (13)$$

where: Zn_{out} = zinc load leaving lake, in pounds
 Zn_{in} = lead zinc entering lake, in pounds
 Zn_{sol} = dissolved zinc load passing through lake, in pounds
 Zn_{set} = zinc load settling in lake, in pounds
 e_{trap} = trapping efficiency, in pounds per pound
 t_s = maximum settling time, in days
 V_s = settling velocity, in meters per day

Since the loads and concentrations computed by the metals model are annual average values, and the State's standards are based on peak concentrations, an evaluation of the expected extremes in the metals concentrations is needed. If the assumption is made that the one percent exceedence level will be indicative of high metals loads, the needed parameter for each metal is the concentration that correlates to this probability. This parameter is evaluated by assuming that the concentrations of the modeled metals can be estimated using a standard lognormal distribution with a skew factor of zero and a coefficient of variation of 0.5. By creating a cumulative distribution for each metal, the concentration that would be equaled or exceeded only 1 percent of the time is then 2.7 times the estimated mean concentration of each metal. This test is applied directly by the lake model.

APPENDIX E – Legal Authority for Illegal Connections

ORDINANCE NO. (2001) 3007

AN ORDINANCE TO CREATE A NEW ARTICLE VI
"STORMWATER DISCHARGE ORDINANCE"
IN CHAPTER 17, WATER AND SEWER

Section One. That a new Article VI, Stormwater Discharge, in Chapter 17 of the Garner Town Code, Water and Sewer be created as follows:

Sec. 17-90. TITLE. This chapter shall be known and may be cited as the Town of Garner's "Illicit Discharge Ordinance."

Section Two Sec. 17-91. PURPOSES.

(a) This chapter is adopted for the purposes of:

- (1) Protecting the public health, safety and welfare by controlling the discharge of pollutants into the stormwater conveyance system;
- (2) Promoting activities directed toward the maintenance and improvement of surface and ground water quality;
- (3) Satisfying the requirements imposed upon the Town of Garner by the North Carolina Division of Water Quality in order to conform with the Neuse under its National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) discharge permit issued by the State; and
- (4) Establishing administration and enforcement procedures through which these purposes can be fulfilled.

(b) The provisions of this regulation are supplemental to regulations administered by Federal and State governments.

Sec. 17-92. ACRONYMS.

DEHNR: North Carolina Department of Environment Health and Natural Resources.

DEM: North Carolina Division of Environmental Management.

MS4: Municipal separate storm sewer system.

NPDES: National Pollutant Discharge Elimination System.

Sec. 17-93. DEFINITIONS.

As used in this chapter, unless the context clearly indicates otherwise, the following definitions apply:

Illicit connection. Any unlawful connection which allows the discharge of non-stormwater to the stormwater conveyance system or waters of the State in violation of this chapter.

Illicit discharge. Any unlawful disposal, placement, emptying, dumping, spillage, leakage, pumping, pouring, emission, or other discharge of any substance other than stormwater into a stormwater conveyance, the waters of the State, or upon the land in such proximity to the same, such that the substance is likely to reach a stormwater conveyance or the waters of the State.

Municipal separate storm sewer system (MS4). A stormwater conveyance or unified stormwater conveyance system (including without limitation~ roads with drainage systems, municipal streets, catch basins, stormwater detention facilities, curbs, gutters, ditches, natural or man-made channels, or storm drains), that:

- (1) Is located within the corporate limits of Garner, North Carolina; and
- (2) Is owned or operated by the State, County, the Town, or other public body; and
- (3) Discharges to waters of the State, excluding publicly owned treatment works, and lawful connections thereto, which in turn discharge into the waters of the State.

National Pollutant Discharge Elimination System. A permitting system established pursuant to §402 of the Clean Water Act et seq.

Federal law reference: National Pollutant Discharge Elimination System Permits, 33 USC §1342.

Pollution. Man-made or man-induced alteration of the chemical, physical, biological, thermal, and/or radiological integrity of water.

Stormwater. Any flow resulting from, and occurring during or following, any form of natural precipitation.

Stormwater conveyance or stormwater conveyance system. Any feature, natural or man-made, that collects and transports stormwater, including but not limited to roads with drainage systems, streets, catch basins, curbs, gutters, ditches, man-made and natural channels, pipes, culverts, and storm drains, and any other natural or man-made feature or structure designed or used for collecting or conveying stormwater.

Waters of the State. Surface waters within or flowing through the boundaries of the State including the following: any intermittent or perennial stream, river, creek, brook, swamp, lake, sound, tidal estuary, bay, reservoir, wetland, or any other surface water or any portion thereof that is mapped as solid or dashed blue lines on United States Department of the Interior Geological Survey 7.5 minute series topographic maps. Treatment systems, consisting of man-made bodies of water, which were not originally created in waters of the State and which are not the result of impoundment of waters of the State, are not waters of the State.

Sec. 17-94. SCOPE AND EXCLUSIONS.

This chapter shall apply within the territorial jurisdiction of the Town, with the following exclusions: Federal, State, and local governments, including their agencies, unless intergovernmental agreements have been established giving the Town enforcement authority.

Sec. 17-95. OBJECTIVES.

The objectives of this chapter are to:

- (1) Regulate the discharge of substances which may contaminate or cause pollution of stormwater, stormwater conveyances, or waters of the State;
- (2) Regulate connections to the stormwater conveyance system;
- (3) Provide for the proper handling of spills; and
- (4) Provide for the enforcement of same.

Sec. 17-96. NON-STORMWATER DISCHARGE CONTROLS.

(a) Illicit discharges.

No person shall cause or allow the discharge, emission, disposal, pouring, or pumping directly or indirectly to any stormwater conveyance, the waters of the State, or upon the land in such proximity to the same (such that the substance is likely to reach a stormwater conveyance or the waters of the State), any fluid, solid, gas, or other substance, other than stormwater; provided that non-stormwater discharges associated with the following activities are allowed provided that they do not significantly impact water quality:

- (1) Filter backwash and draining associated with swimming pools;
- (2) Filter backwash and draining associated with raw water intake screening and filtering devices;
- (3) Condensate from residential or commercial air conditioning;
- (4) Residential vehicle washing;
- (5) Flushing and hydrostatic testing water associated with utility distribution systems;
- (6) Discharges associated with emergency removal and treatment activities, for hazardous materials, authorized by the federal, State, or local government on-scene coordinator;
- (7) Uncontaminated ground water [including the collection or pumping of springs, wells, or rising ground water and ground water generated by well construction or other construction activities];
- (8) Collected infiltrated stormwater from foundation or footing drains;
- (9) Collected ground water and infiltrated stormwater from basement or crawl space pumps;
- (10) Irrigation water;
- (11) Street wash water;

- (12) Flows from fire fighting;
- (13) Discharges from the pumping or draining of natural watercourses or waterbodies;
- (14) Flushing and cleaning of stormwater conveyances with unmodified potable water;
- (15) Wash water from the cleaning of the exterior of buildings, including gutters, provided that the discharge does not pose an environmental or health threat; and
- (16) Other non-stormwater discharges for which a valid NPDES discharge permit has been approved and issued by DEM, and provided that any such discharges to the municipal separate storm sewer system shall be authorized by the Town.

Prohibited substances include but are not limited to: oil, anti-freeze, chemicals, animal waste, paints, garbage, and litter.

(b) Illicit connections.

- (1) Connections to a stormwater conveyance or stormwater conveyance system which allow the discharge of non-stormwater, other than the exclusions described in section (a) above, are unlawful. Prohibited connections include, but are not limited to: floor drains, waste water from washing machines or sanitary sewers, wash water from commercial vehicle washing or steam cleaning, and waste water from septic systems.
- (2) Where such connections exist in violation of §13-5007 and said connections were made prior to the adoption of this provision or any other ordinance prohibiting such connections, the property owner or the person using said connection shall remove the connection within one (1) year following application of this regulation; provided that, this grace period shall not apply to connections which may result in the discharge of hazardous materials or other discharges which pose an immediate threat to health and safety, or are likely to result in immediate injury and harm to real or personal property, natural resources, wildlife, or habitat.
- (3) Where it is determined that said connection:

- a. May result in the discharge of hazardous materials or may pose an immediate threat to health and safety, or is likely to result in immediate injury and harm to real or personal property, natural resources, wildlife, or habitat, or
- b. Was made in violation of any applicable regulation or ordinance.

The Town Manager or his designee shall designate the time within which the connection shall be removed. In setting the time limit for compliance, the Town shall take into consideration:

- a. The quantity and complexity of the work,
- b. The consequences of delay,
- c. The potential harm to the environment, to the public health, and to public and private property, and
- d. The cost of remedying the damage.

Permits are issued by the Inspections Department for connection to or modification of storm sewers located in Town owned rights-of-way.

(c) Spills.

Spills or leaks of polluting substances discharged to, or having the potential to be indirectly transported to the stormwater conveyance system, shall be contained, controlled, collected, and removed promptly. All affected areas shall be restored to their preexisting condition.

Persons associated with the spill or leak shall immediately notify the Town of Garner Fire Chief or his designee of all spills or leaks of polluting substances. Notification shall not relieve any person of any expenses related to the restoration, loss, damage, or any other liability which may be incurred as a result of said spill or leak, nor shall such notification relieve any person from other liability which may be imposed by State or other law.

Sec. 17-97. ENFORCEMENT.

(a) Authority to enter.

Any authorized Town personnel shall be permitted to enter upon public or private property for the purposes of observation, inspection, sampling, monitoring, testing, surveying, and measuring compliance. Should the owner or occupant of any property refuse to permit such reasonable access, the Town Manager or his designee shall proceed to obtain an administrative search warrant pursuant to G.S. 15-27.2 or its successor.

No person shall obstruct, hamper or interfere with any such representative while carrying out his official duties.

(b) Civil penalties.

(1) Illicit discharges.

Any designer, engineer, contractor, agent, or any other person who allows, acts in concert, participates, directs, or assists directly or indirectly in the creation of a violation of this chapter shall be subject to civil penalties as follows

- a. For first time offenders, if the quantity of the discharge is equal to or less than five (5) gallons and consists of domestic or household products in quantities considered ordinary for household purposes, said person shall be assessed a civil penalty not to exceed one hundred dollars (\$100.00) per violation or per day for any continuing violation, and if the quantity of the discharge is greater than five (5) gallons or contains non-domestic substances, including but not limited to process waste water, or if said person cannot provide clear and convincing evidence of the volume and nature of the substance discharged, said person shall be assessed a civil penalty not to exceed one thousand dollars (\$1,000.00) per violation or per day for any continuing violation.
- b. For repeat offenders, the amount of the penalty shall be double the amount assessed for the previous penalty, not to exceed ten thousand dollars (\$10,000.00) per violation or per day for any continuing violation.

- c. In determining the amount of the penalty, the Town Manager or his designee shall consider:
 - 1. The degree and extent of harm to the environment, the public health, and public and private property;
 - 2. The cost of remedying the damage;
 - 3. The duration of the violation;
 - 4. Whether the violation was willful;
 - 5. The prior record of the person responsible for the violation in complying or failing to comply with this chapter;
 - 6. The costs of enforcement to the public; and
 - 7. The amount of money saved by the violator through his, her, or its noncompliance.

(2) Illicit connections.

Any person found with an illicit connection in violation of this chapter and any designer, engineer, contractor, agent, or any other person who allows, acts in concert, participates, directs, or assists directly or indirectly in the establishment of an illicit connection in violation of this chapter, shall be subject to civil penalties as follows:

- a. First time offenders shall be subject to a civil penalty not to exceed five hundred dollars (\$500.00) per day of continuing violation.
- b. Repeat violators shall be subject to a civil penalty not to exceed one thousand dollars (\$1,000.00) per day of continuing violation.
- c. In determining the amount of the penalty, the Town Manager or his designee shall consider:
 - 1. The degree and extent of harm to the environment, the public health, and public and private property;
 - 2. The cost of remedying the damage

3. The duration of the violation;
 4. Whether the violation was willful;
 5. The prior record of the person responsible for the violation in complying or failing to comply with this chapter;
 6. The costs of enforcement to the public; and
 7. The amount of money saved by the violator through his, her, or its noncompliance.
- d. Procedures for assessing penalties pursuant to illicit connections.

Said penalties shall be assessed by the Town Manager or his designee. No penalty shall be assessed until the person alleged to be in violation is served written notice of the violation by registered mail, certified mail-return receipt requested, or personal service. Refusal to accept the notice shall not relieve the violator of the obligation to pay the penalty. The notice shall describe the violation with particularity and specify the measures needed to come into compliance. The notice shall designate the time within which such measures must be completed. In setting the time limit for compliance, the Town shall take into consideration:

1. The quantity and complexity of the work;
2. The consequences of delay;
3. The potential harm to the environment, the public health, and public and private property; and
4. The cost of remedying the damage.

The notice shall warn that failure to correct the violation within the specified time period will result in the assessment of a civil penalty and/or other enforcement action. If after the allotted time period has expired, and the violation has not been corrected, the penalty shall be assessed from the date of receipt of notice of violation and each day of continuing violation thereafter shall constitute a separate violation under this section

Any person found in violation of other provisions of this chapter, not specifically enumerated elsewhere, shall be subject to a civil penalty not to exceed one hundred dollars (\$100.00) per violation or per day for any continuing violation.

(4) Payment/collection procedures.

Penalties shall be assessed by the Town Manager or his designee. No penalty shall be assessed until the person alleged to be in violation is served written notice of the violation by registered mail, certified mail-return receipt requested, or personal service. Refusal to accept the notice shall not relieve the violator of the obligation to pay the penalty. The Town Manager or his designee shall make written demand for payment upon the person in violation. If the payment is not received or equitable settlement reached within thirty (30) days after demand for payment is made, the matter shall be referred to the Town Attorney for institution of a civil action in the name of the Town, in the appropriate division of the general court of justice in Wake County for recovering the penalty.

(c) Injunctive relief.

- (1) Whenever the Board of Aldermen has a reasonable cause to believe that any person is violating or threatening to violate this chapter, rule, regulation, order duly adopted or issued pursuant to this chapter or making a connection to a stormwater conveyance or stormwater conveyance system other than in accordance with the terms, conditions, and provisions of approval, the Town may, either before or after the institution of any other action or proceeding authorized by the Code, institute a civil action in the name of the Town for injunctive relief to restrain and abate the violation or threatened violation.
- (2) The institution of an action for injunctive relief under subsection (c) shall not relieve any party to such proceeding from any further civil or criminal penalty prescribed for violations of this Code.

(d) Criminal penalties.

Any person who knowingly or willfully violates any provision of this chapter, rule, regulation, order duly adopted or issued pursuant to this chapter shall be guilty of a misdemeanor, punishable by a fine not to exceed five hundred dollars (\$500.00) or imprisonment for not longer than thirty (30)days. Each violation shall be a separate offense.

Section Two. That this ordinance shall be effective upon adoption.

This the 5th day of February, 2000.

APPENDIX F – Illegal Connection Notice and Mailing List

The following is a listing of the business types that will be notified concerning the Town of Garner Illegal Discharge Program:

- Vehicle rental agencies
- Painting contractors
- Carpet cleaners
- Automotive repair and service shops
- Automobile body repairing and painting
- Automobile dealers new and used
- Automobile service stations
- Car washing and detailing
- Oil change services
- Limousine service
- Lawn care companies
- Lawn maintenance companies
- Pest control companies
- Kennels
- Janitor service
- Air conditioning/heating contractors
- Apartments
- Boilers-repair and cleaning
- Building cleaning-exterior
- Ready-mixed concrete suppliers
- Swimming pool service and repair
- Parking area maintenance

The Town of Garner adopted an "Illegal Discharge Ordinance" on February 5, 2001 in order to satisfy requirements of the State and protect the water quality of local streams and the Neuse River. This ordinance prohibits illegal connections and/or discharges to the Town's storm drain system (streets, catch basins, curbs, gutters, ditches, man-made and natural channels, pipes, culverts, etc.). Illegal discharges include any discharge other than stormwater, except for the activities listed below (*provided they do not significantly impact water quality*).

- (1) Dechlorinated filter backwash and draining associated with swimming pools;
- (2) Filter backwash and draining associated with raw water intake screening and filtering devices;
- (3) Condensate from residential or commercial air conditioning;
- (4) Residential vehicle washing;
- (5) Flushing and hydrostatic testing water associated with utility distribution systems;
- (6) Discharges associated with emergency removal and treatment activities, for hazardous materials, authorized by the federal, *State*, or local government on scene coordinator;
- (7) Uncontaminated ground water (including the collection or pumping of springs, wells, or rising ground water and ground water generated by well construction or other construction activities);
- (8) Collected infiltrated *stormwater* from foundation or footing drains;
- (9) Collected ground water and infiltrated *stormwater* from basement or crawlspace pumps;
- (10) Irrigation water;
- (11) *Street* wash water;
- (12) Flows from fire fighting;
- (13) Discharges from the pumping or draining of natural watercourses or waterbodies;

- (14) Flushing and cleaning of *stormwater conveyances* with unmodified potable water;
- (15) Wash water from the cleaning of the exterior of buildings, including gutters, provided that the discharge does not pose an environmental or health threat; and
- (16) Other non-stormwater discharges for which a valid NPDES discharge permit has been approved and issued by DEM, and provided that any such discharges to the *Municipal Separate Storm Sewer System shall* be authorized by the Town.

Prohibited substances include but are not limited to: oil, anti-freeze, chemicals, animal waste, paints, garbage, and litter.

A copy of the ordinance can be obtained by calling the Town of Garner Engineering Department (772-4688).

APPENDIX G – Procedure for Computing Nitrogen Baseline and Net Change

Procedure for Computing Nitrogen Baseline

As a part of the annual reporting requirements a nitrogen baseline must be determined for all projects. This baseline will be calculated by determining the total nitrogen export based upon predeveloped land uses. The export loading rates for the various types of land use is presented as follows:

<u>Land Use Type</u>	<u>Nitrogen Export (lbs/ac/yr)</u>
Forest Land	1.7
Pasture	4.4
Residential	7.5
Commercial/Industrial	13.0
Cropland	13.6

The export loading rates for the various land uses are multiplied by the number of acres for each of these land types and then added together to determine the total nitrogen export in pounds/year.

Example:

250 acres of land was developed/redeveloped this past year. The existing land use acreage prior to development was as follows:

Forest Land	100 acres
Pasture	80 acres
Residential	20 acres
Industrial/Commercial	0 acres
Cropland	50 acres

Total nitrogen export for this land is computed as follows:

<u>Land Type</u>	<u>Nitrogen Export Rate (lbs/ac/yr)</u>		<u>Acres</u>	<u>Nitrogen Export (lbs/yr)</u>
Forest Land	1.7	x	100	170
Pasture	4.4	x	80	352
Residential	7.5	x	20	150
Industrial/Comm.	13.0	x	0	0
Cropland	13.6	x	<u>50</u>	<u>680</u>
			TOTAL 250	TOTAL <u>1,352</u>

The nitrogen baseline for land developed last year is 1,352 lbs/year.

Procedure for Computing Net Nitrogen Export Change

In order to determine net nitrogen export change for each year several pieces of information are needed. This information will be calculated as a part of the site plan review process. The information needed is as follows:

- Nitrogen baseline
- Post development nitrogen loading without BMPs
- Post development nitrogen loading with BMPs
- Pounds of nitrogen purchased

For a given year the net change in nitrogen loading would be the post development nitrogen loading with BMPs less the total of the existing nitrogen baseline loading and the pounds of nitrogen purchased. A positive value denotes an increase in nitrogen export whereas a negative number represents a decrease in nitrogen export.

Determining the net reduction of nitrogen loading due to BMPs and Wetland Restoration Payments is also required as a part of the annual reporting. The net reduction is determined by calculating the difference between the nitrogen loading with BMPs and without BMPs and adding the pounds of nitrogen purchased through the Wetlands Restoration Program.

Example:

The development of the 250 acres of land presented in the previous example has produced the following results:

- The total nitrogen loading of the development has been calculated to be 2,500 lbs/year.
- BMPs will be installed such that the resulting total nitrogen export will be 2,000 lbs/year.
- 500 pounds of nitrogen credits have been purchased thru the Wetlands Restoration Fund.

Net change in nitrogen = 2,000 lbs/year loading with BMPs - 1,352 lbs/year baseline nitrogen (from previous example) - 500 lbs/year purchased = 148 lbs/year

For the past year the net change in nitrogen is an increase of 148 lbs/yr.

Net reduction in nitrogen due to BMPs and payments = 2,500 lbs/year loading without BMPs - 2,000 lbs/year loading with BMPs + 500 lbs/year nitrogen purchased = 1,000 lbs/year.

For the past year the installation of proposed BMPs and purchase of nitrogen credits will result in a reduction of nitrogen loading of 1,000 lbs/year.